

# REPORT

Assessment of the degree of impact  
of investment proposal:

„CONSTRUCTION OF NATIONAL DISPOSAL FACILITY FOR LOW AND  
INTERMEDIATE LEVEL RADIOACTIVE WASTE – NDF“

on

the subject and purposes for conservation of protected areas

BG0002009 „Zlatiyata” for conservation of wild birds,

BG0000533 „Kozloduy Islands”, BG0000614 „Ogosta River” and

BG0000508 “Skat River” for conservation of natural habitats and the wild  
flora and fauna



January, 2015

INVESTOR: State Enterprise Radioactive Waste  
(SERAW)

**INVESTMENT PROPOSAL:** *„Construction of a National disposal facility for low and intermediate level radioactive waste – NDF“ at Radiana Site, situated at the territory of the Harlets village, Kozloduy Municipality in the immediate vicinity of the Kozloduy NPP*

**REPORT**

**on assessment of the degree of impact by plans,  
programmes and designs/investment proposals  
on protected areas**

(In accordance with Regulation on Assessment of the Compatibility of any Plans, Programmes, Projects and Investment Proposals with the Subject and Purposes of Preservation of the Protected Areas, effective as of 11.09.2007, Approved by Government Decree № 201 31.08.2007, SG No 73/11.09.2007, last amended SG № 94/30.11.2012)

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## I. ANOTATION OF INVESTMENT PROPOSAL

### I.1 *Basis for elaboration of compatibility assessment.*

The present Assessment for degree of the impact on the the nearest Natura 2000 protected sites of the Investment Proposal for Construction of National repository for burial of Low and Intermediate Radioactive Waste (NRRAW) at the “Radiana” site in the area of the village of Harlets, Kozloduy Municipality, in close vicinity of NPP “Kozloduy”, complies with letter of RIEW Vratsa Outgoing Correspondence No B-981/29.05.2014 (Appendix No 1) and is in accordance with the requirements of the Biological Diversity Act (OJ, No 77/2002 last amended in OJ, No 66/2013), the Directive 2009/147/EC on the conservation of wild birds, the Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, and the Ordinance on the conditions and procedures for compatibility assessment of plans, programs, projects and investment proposals with the subject and objectives for preservation of protected sites adopted by the Council of Ministers Decree No 201 of 31 August 2007 (Official Journal, No 73/2007, last amended in OJ, No 94/2012).

It is important here to stress that in 2010-2011 in compliance with the requirements of the EPA (Environmental Protection Act, Official Journal, No 91 of 25 September 2002, last amended in OJ, No 66/2013) an environmental impact assessment procedure has been conducted and it led to the EIA Decision No 21-9/2011 issued on 10.10.2011 by the Minister of Environment and Water to approve the Investment proposal of SE RAW for Construction of National repository for burial of Low and Intermediate Radioactive Waste.

Consequently, the EIA Decision is appealed by Mr Peter Penchev Troyanski before the Supreme Administrative Court. By Decision No 11040/22.07.2013 the three-judge panel of the Supreme Administrative Court annulled the EIA Decision and referred the administrative file back to the Minister of Environment and Water. By Decision No 15645/26.11.2013 a five-judge panel of the Supreme Administrative Court confirmed the Decision of the tree-judge panel.

Due to the circumstances presented above the EIA procedure was renewed and included conditions stated in the letter Ingoing Correspondence No II-04-11-2139/19.12.2013 from the MoEW.

One of the main observations to the EIA is the absence of a separate application in accordance with the requirements set in Article 34 of the Ordinance on conditions and procedures for compatibility assessment of plans, programs, projects and investment proposals with the subject and objectives of preservation of protected sites (Official Journal, No 73 of 11 September 2007, last amended in OJ, No 94 of 30 November 2012 even though the competent authority, the MoEW issued an opinion by letter Outgoing Correspondence No 26-00-1223/20.11.2009 that, on the basis of Article 39, paragraph 3 of the cited above Ordinance the Investment proposal is unlikely to have a significant impact on the nearest protected Natura 2000 zone (PZ) BG0002009 Zlatiata.

According to the Supreme Administrative Court the assessment under Article 21 should be carried out by the experts reffered to Article 9 on the basis of the criteria set out in Article 22 and is submitted as a *separate annex to the EIA Report*. The assessment should be carried out in compliance with the requirements of Article 23, paragraph 2 of the Ordinance cited above and in accordance with the instructions provided by the MoEW. In this regard, the opinion of the MoEW on the updated Terms of Reference setting out the scope and content of the EIA of the Investment proposal for construction of NRRAW, delivered in a letter Outgoing Correspondence No 26-1943/15.08.2014, also pointed out the need for a Report on assessment of degree of the impact (RADI) as an annex to the EIA Report. The Regional Inspectorate of

Environment and Water (RIEW) Vratsa, for its part, specified the areas for which an assessment of the potential impact is needed in a letter Outgoing Correspondence No B-981/29.05.2014.

The Report on assessment of degree of the impact (RADI) was structured in accordance to Article 23, paragraph 2 of the Ordinance cited above and contained data on the criteria laid down in Article 22 of that Ordinance. The assessment is was based on the best available data.

The evaluation of effects, in terms of quantitative parameters - area of habitats (natural habitats and habitats of species), and population of species –, took into consideration both their reference and actual values which have been published in the reports drawn up after the realisation of the project “**Mapping and identification of the conservation status of habitats and species, Phase 1**” implemented via Operational Program “Environment 2007-2013”. The characteristics of the areas referred to in the relevant updated Natura 2000 standard data forms (201011) were taken into account in order to compare the parameters of habitats and species which are subject to protection within a particular area and parameters of these habitats and species at national level.

In case of impact on sites where restoration is required, the feasibility of this requirement shall be evaluated. This means that if in the past, there has been a permanent destruction of the areas of the habitats, even according to the parameters of a favourable status +, these permanently damaged areas without real opportunities for recovery are not included in the reference values for area and population. This is the case for instance with already established infrastructures, massive buildings, long cultivated agricultural lands and more generally areas, which original characteristics are difficult to restore.

In addition to procedural requirements of the assessment of possible negative effects and their significance the following principles were taken into account:

- the precautionary principle as enshrined in the Treaty establishing the European Economic Community as a basis for environmental protection, in this case, is taken as the acceptance of the worst possible scenario for each possible impact within the scientific prerequisites for the existence of such effects;
- the use of the best available data for the purposes of the assessment;
- the general parameters for the conservation status of each species and habitat are complemented with the potential effects on structures, functions and roles which are important for the concerned species and habitats.

According to letter № 26-00-1943/15.12.2014 of the MoEW for assessment of the quality of the EIA report and the Report on assessment of degree of the impact (RADI) (integral part of the EIA report) observations and recommendations are made and taken into account in this revised Report on assessment of degree of the impact (RADI).

## ***1.2 Information about contracting entity.***

### **Legal name:**

State Enterprise “Radioactive Waste”;

### **Full company address:**

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### **Telephone, fax and e-mail:**

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e-mail: [info@dprao.bg](mailto:info@dprao.bg)

### **Executive director:**

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**Contact person:**

Ira Stefanova:

Tel. +359 02/9035135;

e-mail: [ira.stefanova@dprao.bg](mailto:ira.stefanova@dprao.bg);

**1.3 Purpose of the Investment Proposal.**

The Investment Proposal is intended for Construction of National repository for **burial of Low and Intermediate Radioactive Waste (NRRAW)** at “Radiana” site in the area of village of Harlets, Kozloduy Municipality in immediate vicinity of NPP “Kozloduy”. For this purpose it has been envisaged the construction of a module repository category 2a according to the Bulgarian Ordinance on Safety of Radioactive Waste Management, which is a multi-barrier engineered surface repository.

The selected type of repository completely corresponds to the entered into force in August 2013 new Regulation on Safety of Radioactive Waste Management, according to which (Article 18, item 4) radioactive waste (RAW) from category 2a must be disposed in surface engineering facilities for disposing of RAW.

In the NRRAW shall be disposed only low and intermediate-active waste, category 2a according to the Bulgarian Ordinance on Safety of Radioactive Waste Management, generated on Bulgarian territory. RAW is subject to preliminary treatment in Workshop for RAW Processing of the Specialized department of SE RAW (Specialized department “RAW-Kozloduy”), which is situated on the NPP “Kozloduy” site and is not a concern of this EIA report not either of this paper which represents an annex of the EIA report.

Processed radioactive waste shall be packed in reinforced concrete containers (RCC) which meet the requirements of the Ordinance on the terms and conditions for transportation of radioactive materials and ensure a long-term safe storage.

Composition, thickness and structure of containers are calculated in a manner to avoid excessive radiation exposure out of them (max.  $1\text{ m} \leq 0.1\text{ mSv/h}$  exposure dose at a distance of one meter from containers). **It is not intended to perform further processing and/or conditioning of incoming containers with radioactive waste in the site of NRRAW.**

**The Ordinance on Safety of Radioactive Waste Management defines radioactive waste category 2 as follows:**

- category 2 – low and intermediate level waste: RAW containing radionuclides in concentrations, requiring measures for reliable isolation and detention but not special measures for heat removal during its storage and disposal;
- category 2a – low and intermediate level short-lived waste containing mainly short-lived radionuclides (with a half-life shorter or equal to that of Cs-137) and long-lived alpha emitting radionuclides with specific activity less than or equal to  $4 \cdot 10^6\text{ Bq/kg}$  in a single waste package and less than or equal to  $4 \cdot 10^5\text{ Bq/kg}$  for the whole volume of waste; for such RAW reliable isolation and detention is required for up to several hundred years.

**Waste exceeding the limits defined for category 2a shall not be disposed in NRRAW.**

The throughput of the NRRAW is estimated at 3 to 4 RCC per day. The preliminary assessment of the amount of radioactive waste subject to disposal in the NRRAW is 18,615



packages of RAW (138 200 m<sup>3</sup>). The maximum annual throughput is 800 RCC determined on the basis of RAW intake of 200 days a year, taking into account that a shipment of RAW is carried out only on weekdays and transport will not be performed in adverse weather conditions.

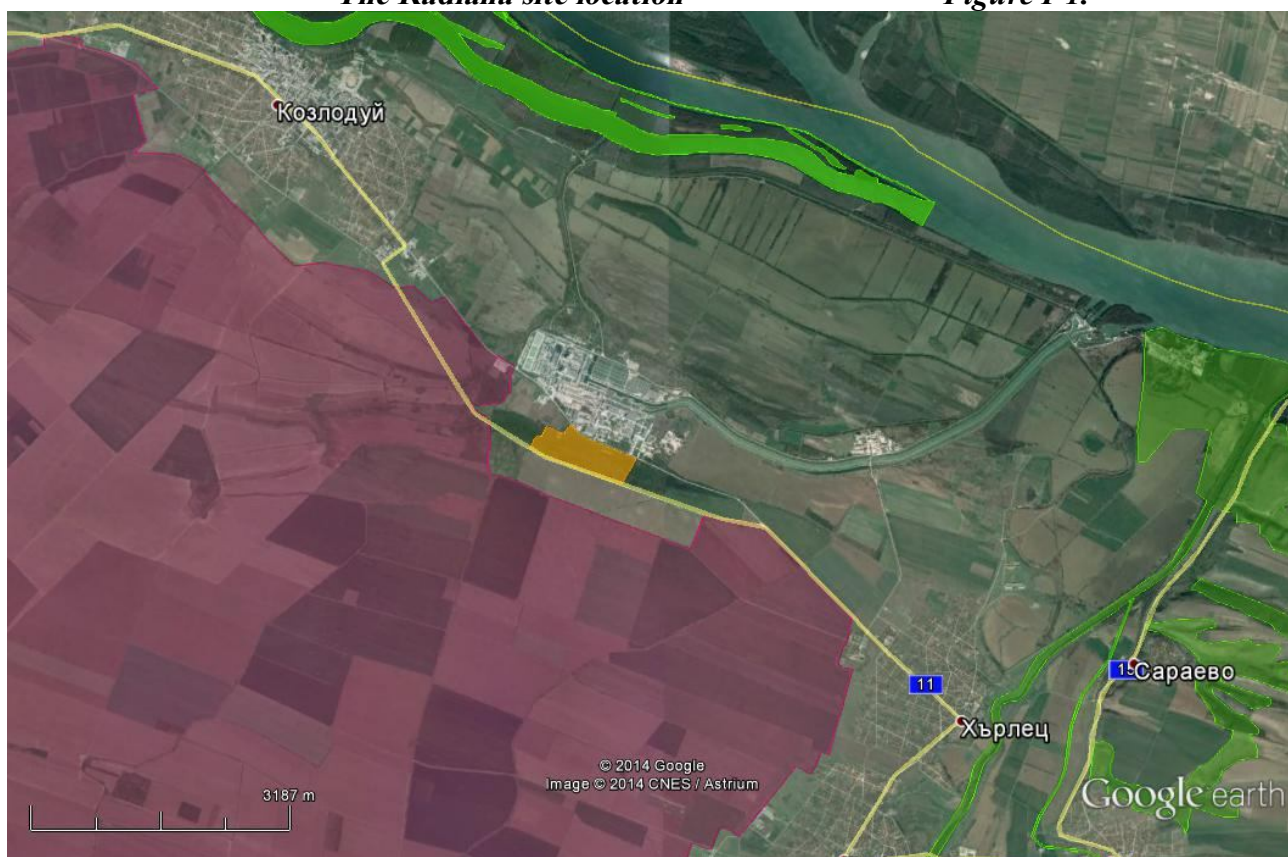
#### ***I.4 Site location, region data and necessary areas.***

##### ***I.4.1 Location of the IP and region data.***

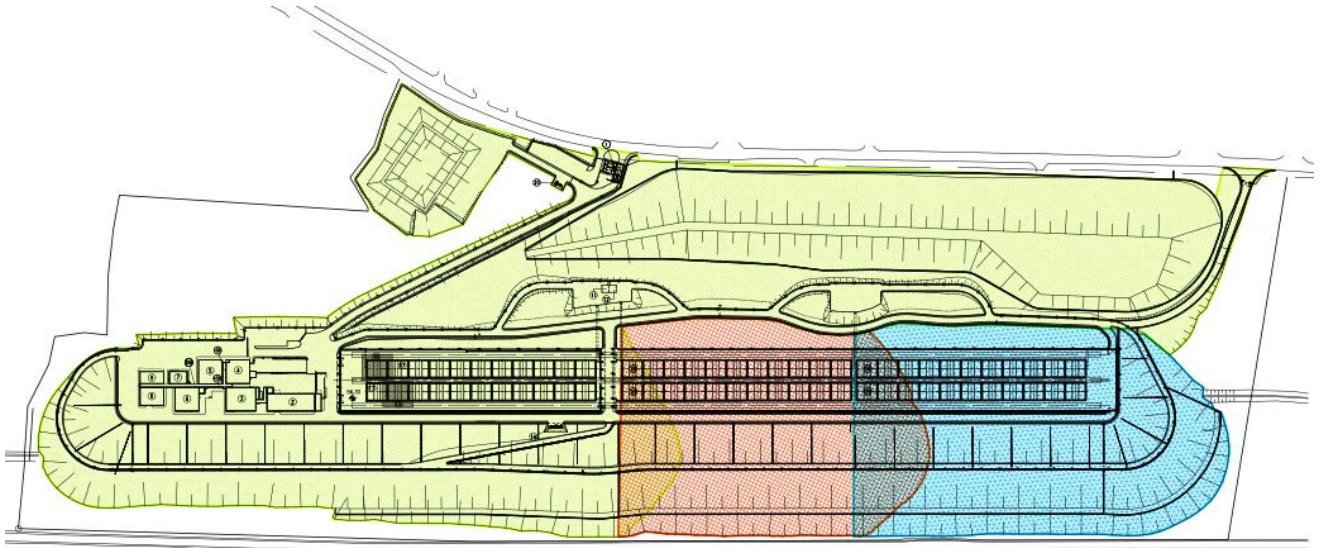
"Radiana" was defined as the site for the construction of the NRRAW after numerous complementary studies and comparisons with other selected sites based on the multi-criteria analysis. The site is situated in immediate vicinity of Kozloduy NPP between two roads, on the north – a road, controlled by Kozloduy NPP and regarded as internal for the plant, and on the south – a section of second-class road (national road No 11), connecting the village of Harlets, Mizia and the town of Kozloduy (Figure I-1.). The part in orange ( — ) shows the area of Radiana site.

***The Radiana site location***

***Figure I-1.***



The site is positioned at 3.3 km south-east from the regulatory line of town of Kozloduy, 4.3 km north-west from the construction boundaries of the village of Harlets and about 4.2 km south-west from the right bank of the Danube River. It covers an area of approximately 36 hectares, roughly rectangular in shape as shown in **Figure № I-2** above with maximum dimensions 470 x 1250 m which is located within the boundaries of the two-kilometer Precautionary action zone (PAZ) of „Kozloduy” NPP.



General plan of NRRAW at Radiana site with a legend regarding to the individual areas and elements of NRRAW and *Annex № 2* of this paper.

At present almost the entire territory of Radiana site is covered with deciduous tree vegetation.

The Investment Proposal affects the following land plots or part thereof :

- property No. 000355, owned by SE RAW, State property with PPU “another urban territory”
- part of property No. 000254, owned by SE RAW, State property with PPU “another urban territory”
- part of property No. 000005 with PPU – “field road”;
- part of property No. 000229 with PPU – irrigation canal;
- property No. 000225 with TPU “sports territory”.

The site is situated at the slope between the first and sixth loess terraces with displacement between them of about 60 m (from elevation +35 m to elevation +94 m) and is located between the second and sixth loess terraces on the non-flooding terrace of the right bank of the Danube River. The lower terrace, (T2), is relatively flat with elevations between 39 and 45 m and occupies the northern and northeastern part of the site. Upper terrace (T6), with elevations between 65 and 93 m occupies the southern sloping part. The average gradient of the site is 8°30'. The “Radiana” site falls within the northern periphery of the Mizia region. The slope outlines on the south the Danubian plain of Kozloduy.

According to the Report on Prognosis of the flood and erosion danger from the Danube River of Radiana site elaborated in May 2011 at a maximum elevation which can be flooded with a probability of  $p=0.01\%$ , the river level can raise to 32.28 m which is below the site elevation i.e. from 39 m and above. Therefore, even at maximum river level there is no flood risk for the repository. Furthermore, at this level of probability the maximum river level is likely to be reached only once in 10 000 years and this determines the very low probability of such an event to occur during the relatively short lifetime of the NRRAW (300-500 years).

Over the past four decades the Radiana site has been examined in detail; first as part of the research to determine the location of NPP Kozloduy site, and between 2007 and 2011 detailed

analysis were carried out for the implementation of the NRRAW site. In 2011 The Geological Institute of Bulgarian Academy of Sciences carried out a study: “Forecast of potential change of geological conditions of the plane part of Radiana site under the most unfavorable hydrological, hydraulic and climatic conditions, and erosion and flood risk assessment”. The thorough investigation of Radiana site has shown that the site is not endangered by any flood or erosion process caused by the Danube River as the estimated maximum rise of water level is 0,9 m. It has been established that the geological characteristics of Radiana site are suitable for the desired objectives. For the purposes of the NRRAW design additional studies of the site were carried out in November and December 2012 by The Geological Institute of Bulgarian Academy of Sciences for justification of the Pliocene sediments upper surface elevation. “Elaboration of geological and hydrogeological profiles of the plateau through the Radiana site to the Danube River” and “Elaboration of hydrogeological map in the NRRAW area of Radiana site” shall further characterize the selected site for the NRRAW implementation.

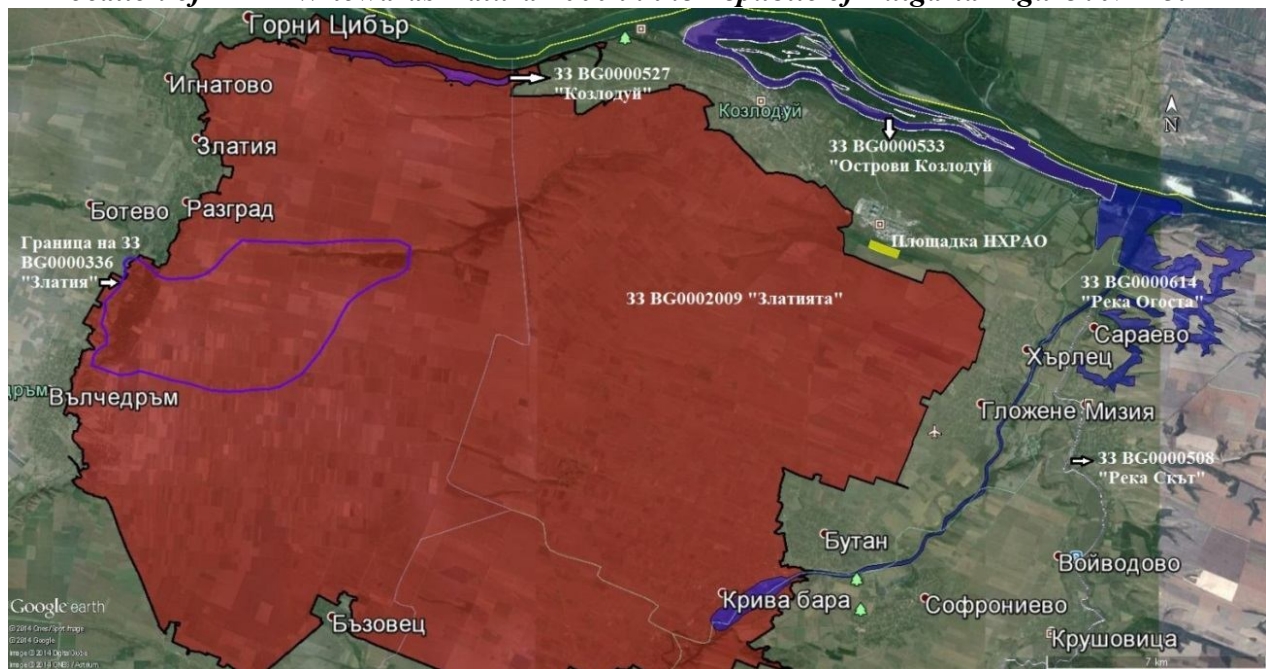
**The nearest protected areas of the European ecological network Natura 2000 in the Republic of Bulgaria located at the external border of the IP site (Figure № I-3) as follows:**

- ***Zlatiyata Protected Area identified by code BG0002009 declared under the Directive 2009/147/EC on the conservation of wild birds.*** The area is located at 0.45 km south and west from the NRRAW site. It is approved by Council of Ministers Decision No 122 of 02.03.2007 (OJ No 21 of 09.03.2007) and is approved by Order No RD-548/05.09.2008 of the MOEW.
- ***Kozloduy Islands Protected Area identified by code BG0000533 declared under Directive 92/43/EEC on the protection of natural habitats and of wild flora and fauna.*** The area is located at 3.8 km north from the NRRAW site. It is approved by Decision of the Council of Ministers No 122 of 2.03.2007 (OJ No 21 of 09.03.2007).
- ***Ogosta River Protected Area identified by code BG0000614 declared under Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.*** The area is located at 6 km east from the NRRAW site. It is approved by Decision of the Council of Ministers No 122 of 2.03.2007 (OJ No 21 of 09.03.2007).
- ***Skat River Protected Area identified by code BG0000508 declared under Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.*** The area is located at 6.3 km east from the NRRAW site. The protected area is approved by Council of Ministers Decision № 122 of 02.03.2007 (OJ No 21 of 09.03.2007).

The location of NRRAW site towards the listed protected areas is shown in **Figure № I-3** below.



Location of NRRAW towards Natura 2000 in the Republic of Bulgaria Figure. № I-3.



#### 1.4.2 Necessary areas for the IP implementation.

The territory subject to status change for the implementation purposes of the NRRAW covers a total area of 464.026 dka, but only one part of which shall be used for construction. A territory balance, according to the project, is shown in Table below.

Balance of NRRAW territory Table № I-1.

Territory	Area, m <sup>2</sup>	Percent, %
Disposal cells – first stage	7 558.3	1.63
Disposal cells – second stage	7 558.3	1.63
Disposal cells – third stage	7 558.3	1.63
Buildings and facilities zone	5 480.3	1.18
Landscaping area	244 480.0	52.69
Undisturbed areas	132 572.8	28.57
Ground – roads and others	58 818.0	12.68
<b>Total</b>	<b>464 026.0</b>	<b>100.00</b>

As can be seen from the territory balance hereabove exactly **377 dka (about 80%)** remain available in the form of planting areas and undisturbed zones, and **only 87 dka (20 %) are planned for construction** of facilities, buildings and elements of infrastructure.

The entire site shall be fenced and secured in accordance with the requirements of the NRA for physical security of the radioactive waste management facilities.

The main activities during the building period will be carried out at the Radiana site. In addition to the areas planned for construction another areas will be required for temporary storage of 90 000 m<sup>3</sup> loess, which be used for the execution of the loess-cement cushion and temporary storage of 68 000 m<sup>3</sup> soil materials, used for the back filling at the site.

In compliance with the requirements of the Safe Use of Nuclear Energy Act and Regulation for the conditions and procedure for establishing of special-statutory areas around nuclear

facilities and facilities with sources of ionizing radiation shall be established Precautionary action zone (PAZ). The PAZ defined in the purpose of NRRAW is confined within the boundaries of the site – inside the area surrounded by an outer fence.

The status of the land within the site and inside its area according to current information of the “Agriculture and Forests” municipal service and the Cadaster, Geodesy and Cartography Agency is given in Table № I-2 below.

**Status of property at the Radiana site and its vicinity** Table № I-2.

<b>№ of property</b>	<b>Owner</b>	<b>PPU</b>	<b>Type of property</b>	<b>Area, dka</b>
000254, formed by 000238	The State, granted to SE “RAW” for the purposes of NRRAW construction by DCM №393/5.07.2013	another urban territory	State property	309.633
000355 formed by 000231	The State, granted to SE “RAW” for the purposes of NRRAW construction by DCM №393/5.07.2013	another urban territory	State property	129.871
000229	MAF-HMS	Irrigation canal	State private	15.606
000225	Municipality of Kozloduy	Sports territory	Municipal private	4.26
000005	Municipality of Kozloduy	Field road	Municipal public	4.656
<b>TOTAL</b>				<b>464.026</b>

It is evident from the Table that the land is mainly a state property, granted to SE RAW for the construction purposes of NRRAW by DCM №393/5.07.2013 by acts of state property on behalf of SE RAW No 3220/03.09.2013 and No 3219/03.09.2013 issued by the district governor of Vratsa region. There are also small land plots which are municipal private property, as well as municipal public property and state property.

Excerpt of cadastral map of the region, within which is located the site, with given numbers and purposes of the land properties in the region is presented in Annex № 3 of this paper.

The Radiana site is divided into two main areas - “controlled area” and “supervised area”.

The facilities for disposing and the building for temporary operational storage of the packages of radioactive waste are situated in the controlled area.

In the supervised area are situated the administrative buildings and the auxiliary facilities – building for access control (checkpoint), administrative building providing appropriate working conditions for the staff with offices, conference room, space for archives and auxiliary equipment, laboratory building for performing laboratory analyses, building of service systems with workshops for various applications, industrial section which contains the energy supply systems and other service systems, main service building which includes approach to the controlled area to areas of general services.

The access of staff and vehicles to/and out of the NRRAW area will be controlled through the checkpoint.



## ***1.5 Description of the Investment Proposal.***

### ***1.5.1 Main characteristics of the facility, the accompanying equipment and service development.***

Based on the current international practice, domestic and foreign regulations and recommended documents, a disposal has been selected by burial of low and intermediate level RAW category 2a in a surface engineering facility, which by definition is located at a depth of several tens of meters from the ground surface, according to the Bulgarian Ordinance on the Safety of Radioactive Waste Management. Taking into account the specific conditions of "Radiana" site, the disposal facility will be located at a depth of 35 m below the ground surface.

The disposal facility is a multi-barrier engineering facility of modular type whose safety is ensured by passive means. Safety is based on the application of deep echelon protection, which is implemented by the simultaneous application of a system of physical barriers and technical and organizational measures, ensuring the following levels of protection:

- ✓ System of successive physical barriers in the way of dissemination of the radioactive substances into the environment;
- ✓ System of technical and organizational measures to protect the barriers and maintain their effectiveness;
- ✓ System of technical and organizational measures to protect the operating personnel;
- ✓ System of technical and organizational measures to protect the population and the environment.

The system of physical barriers (multi-barrier protection) will ensure the safety during the operation of the repository and after closure of the disposal facilities. In the after-operation period the safety of NRRAW will be ensured entirely by the engineering and natural barriers.

A multi-barrier system for insulation of NRRAW includes the following five main components:

- ✓ **First engineering barrier.** This is the form of waste, which is cemented radioactive waste, some of which has already been put in steel drums with or without super pressure.
- **Second engineering barrier.** This is a reinforced concrete container with thick walls, a bottom plate and a lid, where the cemented radioactive waste is put, with the free space between the cement matrix of the waste and the lid of the concrete container being filled with grout, forming a monolithic block. The reinforced concrete container should allow for the extraction of waste in the period until the final closure of the NRRAW. The safety function is to ensure **complete retention** by maintaining mechanical integrity, incl. integrity of the clamps, **for the period of operation of the repository**, which will be **about 60 years**. The reinforced concrete container maintains its functions of a chemical barrier for thousands of years.
- ✓ **Third engineering barrier** of the repository. Includes the reinforced concrete walls of the disposal cell, the lower and upper plates. The specified safety function is retention of the potentially released radionuclides from packages with RAW by maintaining the integrity at reasonably achievable level for a period of 300 years.
- ✓ **Fourth engineering barrier** includes **external** loess-cement base (cushion) and multilayer coating. Besides being a barrier to migration of radionuclides, the base also increases the thickness of the unsaturated zone and improves the overall condition of the base. Multilayer protective coating will be built from natural materials (clay, sand, gravel, etc.) and has many functions.
- ✓ **Fifth (natural) barrier** is performed by the favourable characteristics of the site.

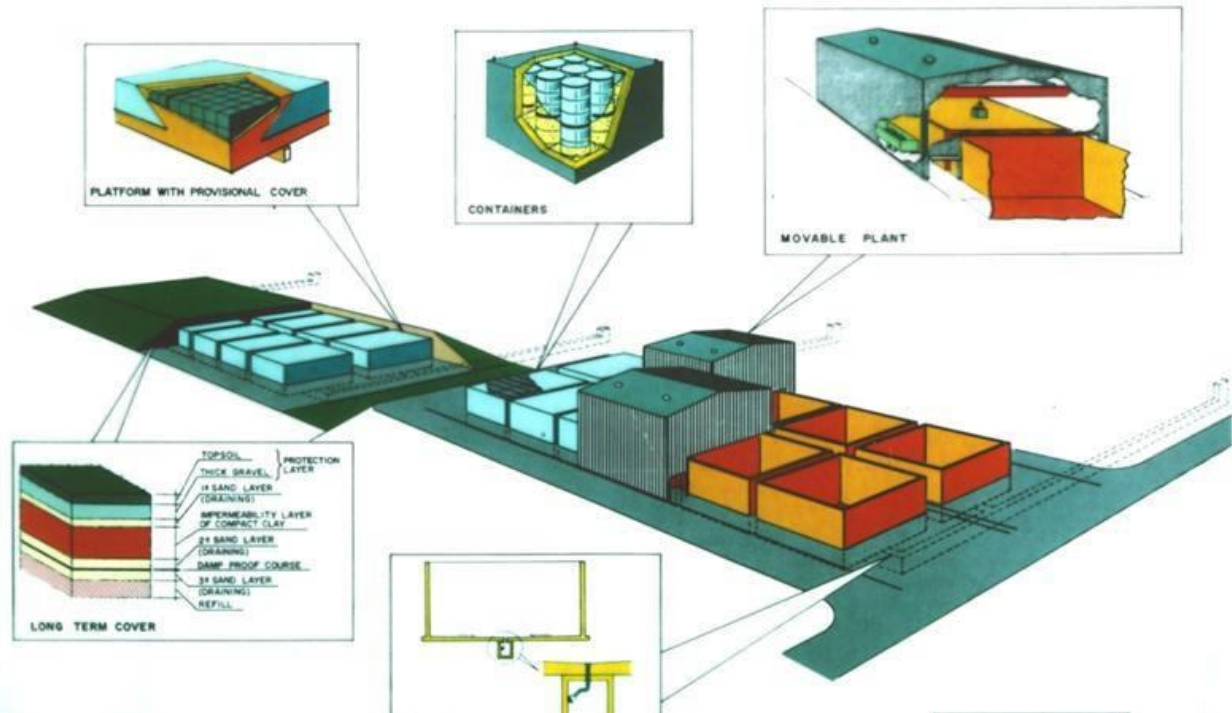
During operation the disposal facilities are protected from surface water (precipitation, surface runoff due to rainfall and snowmelt) through a system of drainage of surface water and by means of a protective hall, lightweight construction over the facilities in operation.

It is envisaged that the equipment will have internal drainage system that allows capture and storage of potentially penetrated (infiltrated) water in the containers with conditioned RAW. The internal drainage system will be built in a way which allows to determine exactly in which cell with buried radioactive waste moisture has penetrated and to determine the condition of the containers.

**Figure № I-4** below presents schematically the system of engineering barriers in the NRRAW.

System of engineering barriers in the NRRAW

**Figure № I-4**

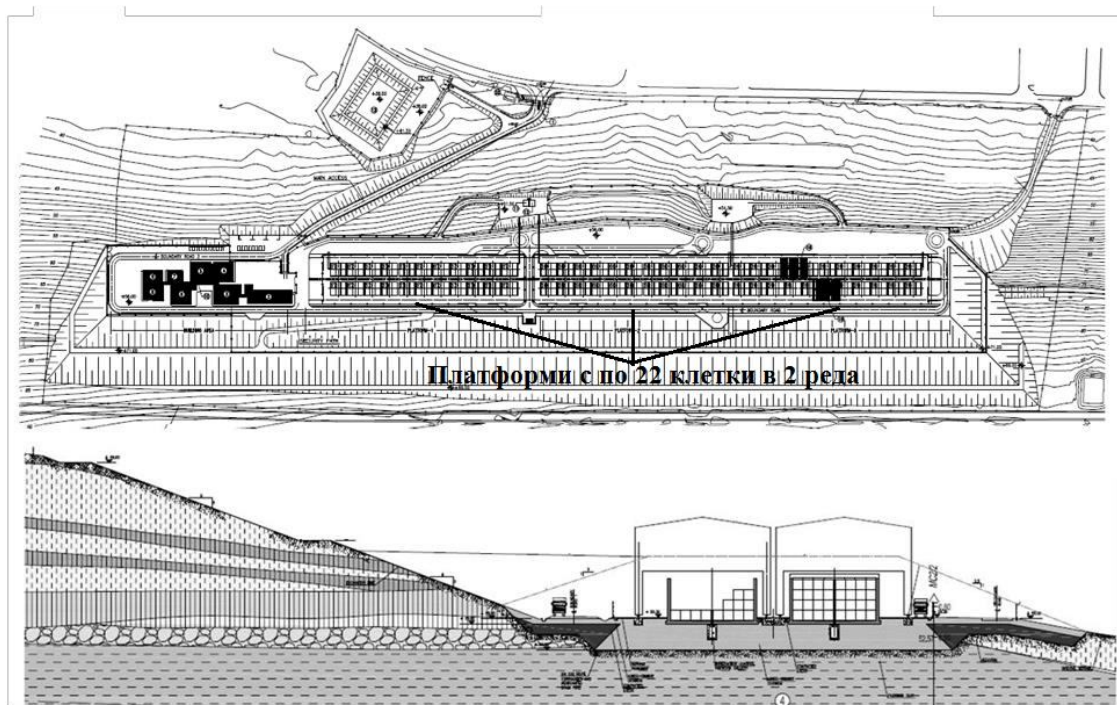


In accordance with the best practices in the developed European countries and the legal requirements established by the Ordinance on the Safety of Radioactive Waste Management, the design of NRRAW provides a technical possibility to retrieve packages with radioactive waste (Reinforced Concrete Containers - RCC) during the period of operation of the repository, although burial by definition is deployment in facilities without the intention of retrieval. Disposal facilities, for which corrective actions can be implemented, are manageable and most secure, since in case of a defect of any of the stored containers there is an option for the container to be removed and RAW in it to undergo repackaging.

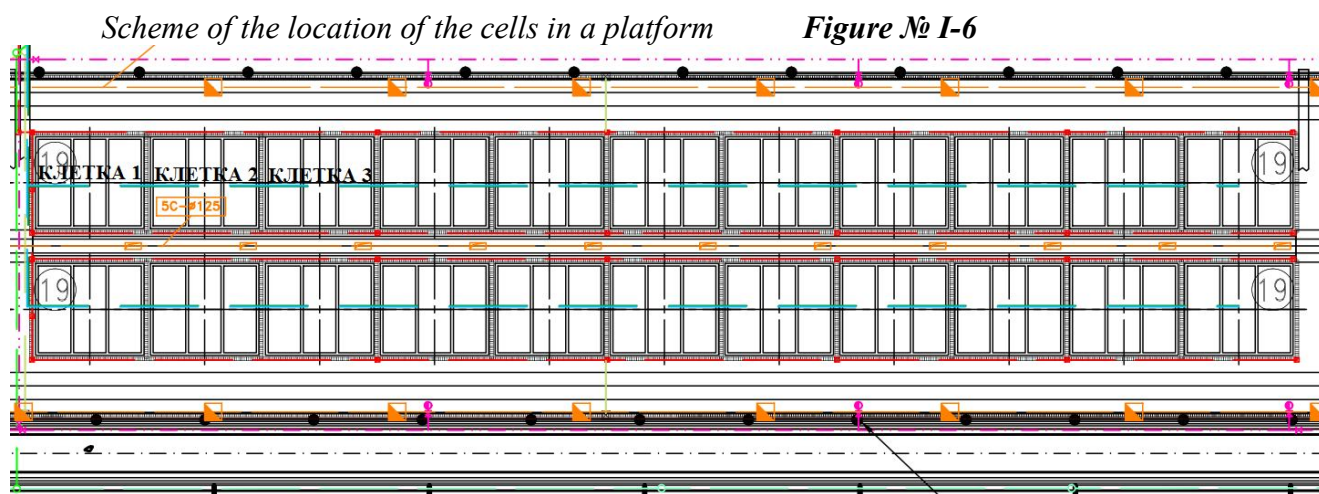
#### I.5.1.1 Type, characteristics, elements and capacity of the repository.

It is envisaged that the NRRAW will have sixty-six (66) cells for burial of the packages with waste. These disposal cells are located on 3 identical platforms, each of which has twenty-two (22) cells, together with their systems. The total built-up area of the platforms is 22 675 m<sup>2</sup> (3x7558.3 m<sup>2</sup>). The first disposal platform will be built before the start of the burial, the second one - in about 20 years, and the third one - after 40 years of operation of the NRRAW. The disposal cells are located in two rows, each of them having eleven cells. **Figure № I-5** below presents schematically the location of the platforms with the cells.

Scheme of the location of the platforms of the NRRAW **Figure № I-5**



**Figure № I-6** presents schematically the location of the cells within the boundaries of one platform.



The disposal cells are monolithic rectangular boxes with a capacity of 288 packages of waste placed in three chambers, each one of them having 96 packages of waste (8x3 packages of waste, stacked in 4 rows one on top of the other). The external dimensions of each cell are 20.15 m length and 17.05 m width. The height is 9.45 m, measured from the level of the foundations to the top of the filled and closed disposal cell. The disposal cell is composed of a lower baseplate, 4 external walls and 2 parallel internal walls, dividing the cell into 3 chambers, 24 covering, prefabricated concrete panels, which are placed on the walls after filling with packages and a top plate for closing, which is built on top of the concrete panels. The cells are

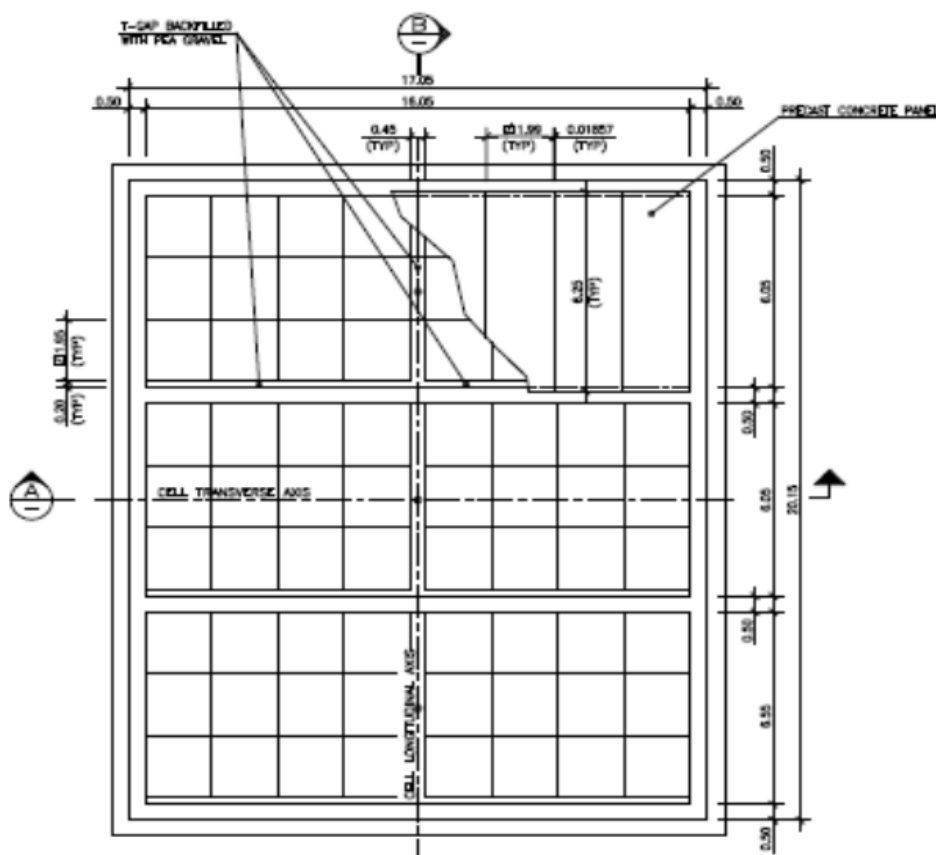
made of reinforced concrete with a wall thickness of 0.5 m and upper plate thickness of 0.6 m. Each cell is structurally independent.

After the disposal cell is completely filled with packages of waste, it is closed with a top plate, which is made of reinforced concrete. During the process of burial and construction of the reinforced concrete plate, the cell will remain covered with a retractable roof for protection of the placed packages and works of closure from meteorological phenomena. Under the retractable roof there is an overhead crane used to place the packages of RAW in place in the cells of the repository.

The bottom plate allows for water, which has penetrated the construction, to be collected and taken away through the network for control of infiltrated water. In each chamber the bottom plate has a slope to the central point of runoff. It is covered with an equalizing layer of porous concrete, on top of which the packages are placed.

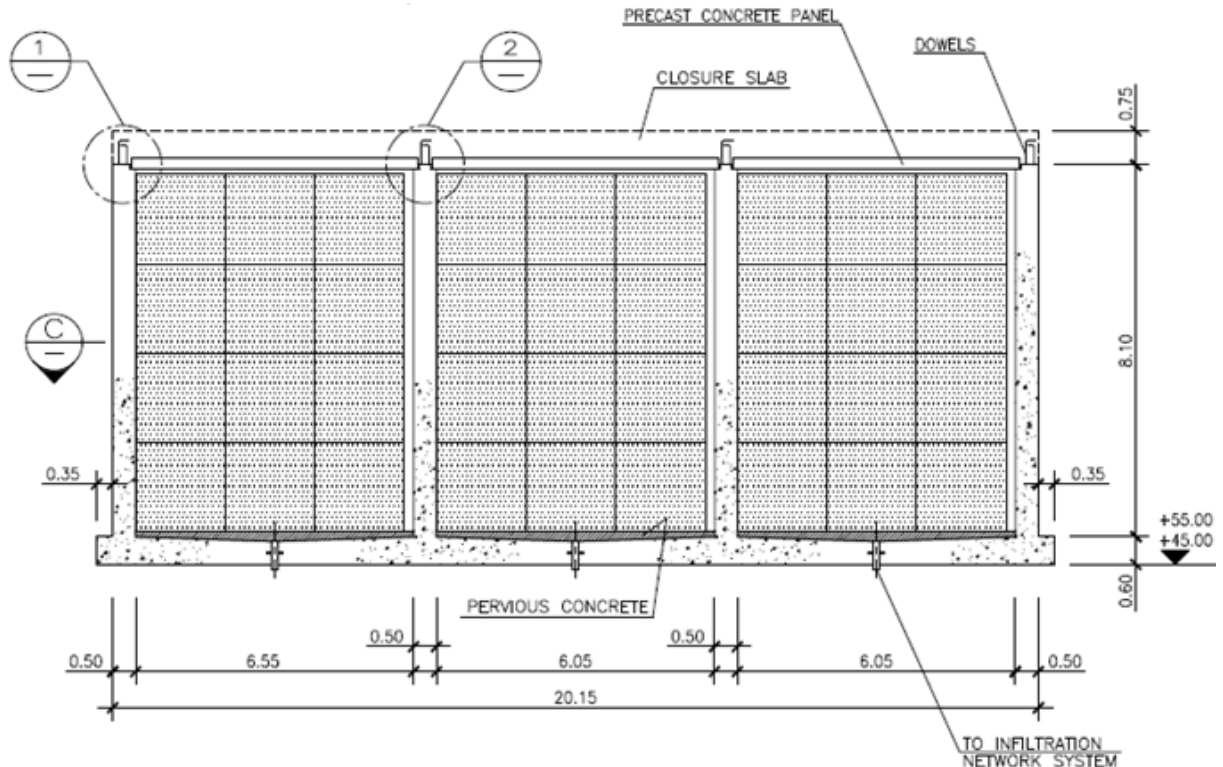
**Figure № I-7** and **Figure № I-8** below present a horizontal and vertical section of the cell for storing RCC.

Geometry of the cell in horizontal plan **Figure № I-7**



Geometry of the cell in vertical plan **Figure № I-8**





Each disposal platform will store 6,336 packages of waste, corresponding to about 20 years of operation of the repository. The total capacity of the NRRAW is 19,008 packages of waste. It should be noted that a total of only 18,615 packages is expected, and the additional capacity of the repository of up to 19,008 packages is a function of the construction of the cells and the total available volume.

The possibility of extracting packages of waste from the disposal cells during the operation period is a design criterion, applied to the NRRAW, as required under the permit for design. For this reason the packages are not fixed to the structure of the disposal cells. If necessary, the packages can be extracted during the operational phase using standard lifting and transport vehicles. If necessary, extraction of packages during the phase of institutional control can be done by means of standard excavation and lifting and handling techniques.

The network for infiltration control is a critical component of the disposal system. It consists of a pipeline system, which collects and controls the water that can penetrate into the disposal cells after their closure, and that can interact with the packages of waste. The pipelines are located in the underground galleries under each row of disposal cells. These galleries are accessible for service. The system includes a pipeline connection of the pipelines coming from each disposal cell and a storage reservoir. The water moves only by gravity. The design of NRRAW includes another two systems for water management: a stormwater pool for surface water and drainage at the base of the slope to the north of the disposal platforms for groundwater. This water can accumulate around the underground structures, if not properly managed, and represents a potential risk to the NRRAW.

**A more detailed description of the barrier insulation system of the NRRAW follows.**

#### *1.5.1.1.1 Characteristics of the first engineering barrier – form of RAW.*

The form of waste is a cemented RAW, some of which has already been included in steel drums with or without super pressure. A safety function of the form of waste (cement matrix in which the waste is placed) is related to the inclusion of radionuclides in the solid phase of the matrix, and retaining them by adsorption and sedimentation in the highly alkaline environment



of the cement. The cement matrix is regarded as a chemical barrier that does not lose its safety functions for thousands of years.

#### *1.5.1.1.2 Characteristics of the second engineering barrier – package of RAW.*

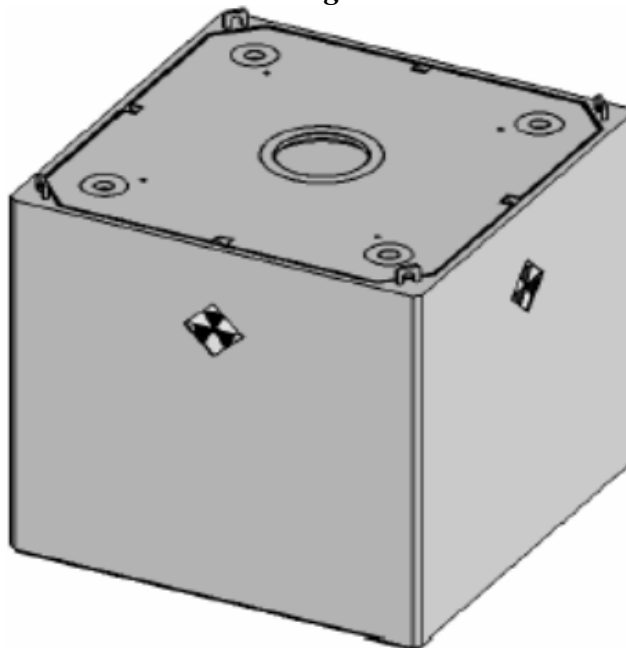
NRRAW is a near-surface multi-barrier engineering facility intended for the disposal of low- and intermediate-level short lived RAW, conditioned and packaged in reinforced concrete containers (RCC), which perform one of the main roles of waste storage. **It is not envisaged to perform conditioning or processing of RAW in NRRRAW.** The package of RAW is designed specifically to be transported to the site of the NRRRAW and buried there.

It is assumed that all waste received in the NRRRAW is fully conditioned in a cement matrix, located in a reinforced concrete container in the shape of a cube with the following main parameters:

- Overall dimensions 1950 x 1950 x 1950 mm;
- Weight of an empty container – 6 tons;
- Maximum weight of a full container and its contents: 20 tons;
- Useful volume: 5 m<sup>3</sup> approximately;
- External volume: 7.41<sup>3</sup> m;
- There are 4 clamps from the top to perform manipulations.

The packages of waste have sufficient structural firmness to allow stacking four of them in height, one on top of the other. A general model of a RCC for RAW disposal in the NRRRAW is presented in **Figure № I 9** below.

*RAW container in NRRRAW Figure № I-9*



The packaging is designed to maintain its mechanical integrity and to ensure full retention of radioactive substances for a period of at least 50 years. For this purpose, the requirements for the structure of the concrete of the packages are defined as:

- Compressive strength indicators not less than 25 MPa;
- Water tightness not less than 0.8;
- Frost-resistance class F 100;

In addition, packages are seismically qualified to withstand 0.20g maximum horizontal ground acceleration when stacked 4 pieces one on top of the other.

**The power of the equivalent dose of gamma radiation from one package of RAW is limited to:**

- 2 mSv / h at the surface;
- 0.1 mSv / h at a distance of 1 m from the surface;

The free surface contamination of the package, averaged for 300 cm<sup>2</sup>, must be less than:

- Bq / cm<sup>2</sup> for  $\beta$  and  $\gamma$  emitters and low toxicity  $\alpha$  emitters;
- 0.4 Bq / cm<sup>2</sup> for all types of  $\alpha$  emitters;

#### *I.5.1.1.3 Characteristics of the third engineering barrier - cells of NRRAW.*

The disposal cells are reinforced concrete shafts for final deployment of packages of RAW. They are grouped in three platforms, each with 22 cells, and their parameters have already been described in section I.5.1.1.

#### *I.5.1.1.4 Characteristics of the fourth engineering barrier - loess-cement base and multi-layer coating.*

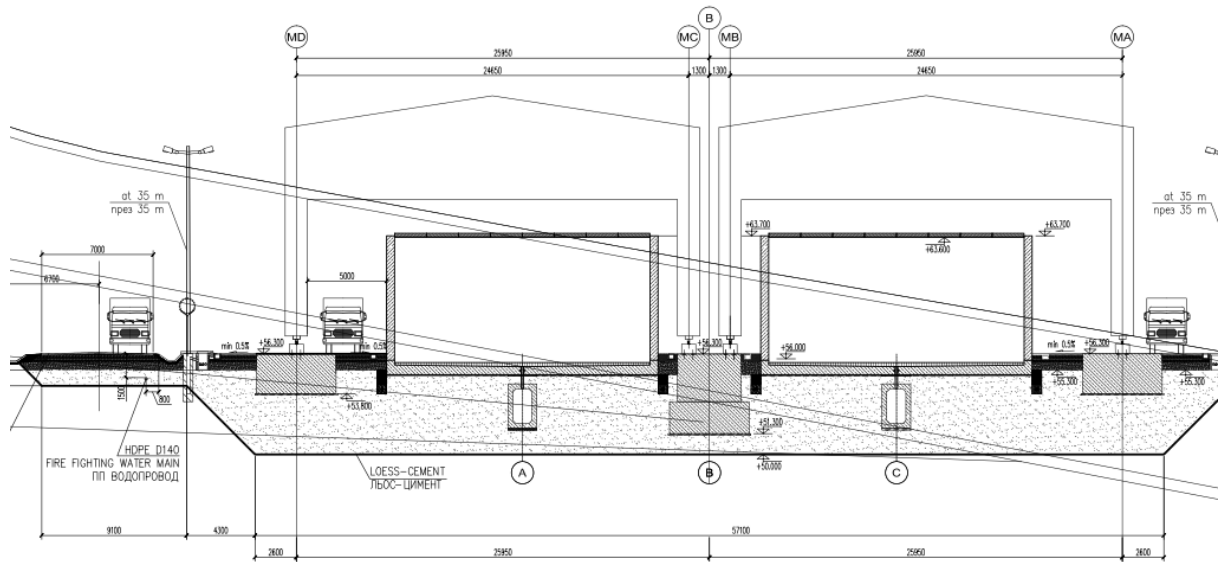
As mentioned, the third (external) engineering barrier includes external loess-cement base and multi-layer coating with the following main parameters:

➤ *Loess-cement base.*

The design base for the foundation of the platforms with the cells consists of loess-cement cushion with the same thickness under the cells of the repository and the border roads (5.0 m). The thickness decreases on both sides (bottom-up) on the outer border of the platforms. The cushion is positioned between elevations +50.0 and +55.0 m. The final thickness of the cushion, in the lateral part of the cells, will be greater in order to cover the edges of the foundation plates. This structure will consist of the loess of the site, supplemented and mixed with cement so as to meet the structural geotechnical integrity and stability of the system. Such a cushion is also envisaged for the foundation of the building designated for receiving and temporary storage of the packages of RAW at the site of NRRAW. **Figure № I-10** below and *Appendix № 4* to the Report on Environmental Impact Assessment (REIA) present a vertical section of the repository with designated location of the loess-cement base.

*Vertical section of NRRAW with designated location of the loess-cement base.*

**Figure № I-10.**



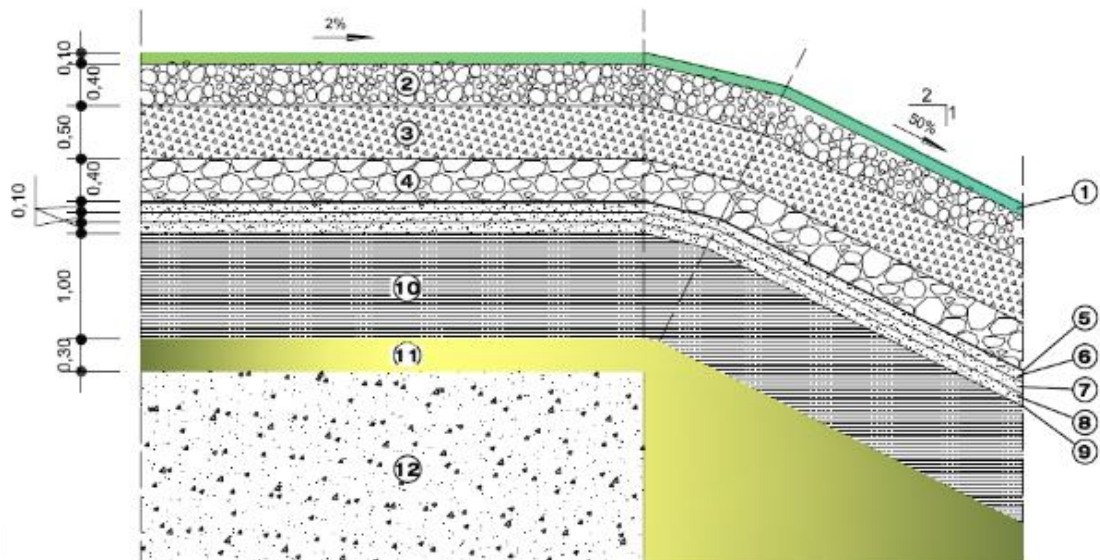
*The loess-cement cushion will perform the following main functions:*

- Increase the bearing capacity and reduce the relative subsidence;
- Insulate the modules of the lens with Pliocene waterlogged fine loamy sand, increase the distance to the level of groundwater (LGW). Avoid potential leaks to the aquifer;
- Establish a system of the network for control of infiltration and galleries;

➤ *Multilayer engineering barrier.*

This barrier is a multilayer structure for covering the disposal in the NRRAW after the activities of filling the cells are completed for all three phases of the operation. The proposed multilayer coating has a total thickness of 3.00 m. The structure of the coating is presented on **Figure № I-11** below and *Appendix № 5*, and its composition is described in *Table № I-3* below.

*Vertical section of multi-layer engineering barrier*      **Figure № I-11.**



**Composition of multi-layer engineering barrier (Legend to Figure № I-11)**

Table № I-3

Layer №	Type of the layer	Description of the layer, function	Depth (m)
1	Topsoil	Soil and vegetation	0,10
2	Anti-erosion clay layer	Clay with gravel, anti-erosion	0,40
3	Loess	Base for planted vegetation	0,50
4	Protective layer of gravel and stones	Protection against mechanical damage	0,40
5	Geotextile	Separates the drainage layer from the coarse soil. Prevents soil contamination.	≈0,01
6	Drainage layer	Sand	0,10
7		Coarse sand / gravel	0,10
8		Gravel	0,10
9	HDPE or geocomposites	Watertight layer of sheets of high density polyethylene or bentonite geocomposites	>0,002
10	Glau layer	Engineering barrier of clay (KMIN = 10-9 m/s)	1,0
11	Supporting base (low-plastic and inorganic)	Granular support base of the engineering barrier (sand-clay and gravel)	0,30
12	Concrete	Concrete for the disposal cells	

*The multi-layer engineering barrier will perform a number of functions, the main ones of which are the following safety functions:*

- Reduce the risk of infiltration of water through the roof and walls of the cells of the repository;
- Serve as a barrier against external intrusion of humans, animals or plants;
- Serve as protection from prolonged erosion agents such as rain and wind;
- Serve as a protective shield against possible radiation in the event of accidents in the cells until the accident is removed;

#### 1.5.1.1.5 Characteristics of the fifth engineering barrier – natural features of the site.

From the perspective of the role of natural features with regard to the safety during the implementation of the investment proposal, the geology of the site is of greatest importance. The immediate geological environment of "Radiana" site and the terrain to its north from top to bottom is made of quaternary formations and Neogene sediments of Brusarski and Archar Formation, where the following engineering-geological layers could be differentiated:

- *Modern soil* with thickness of 0.5 ÷ 1.0 m;
- *Layer 1* - collapsible loess II-nd type (dust loess, light yellow, macro-porous with fragile structure, passing at the foundation into dark brown loess-type of clay with macropores) with a thickness of 6.0 m to 16 m;
- *Layer 2* – non-collapsible loess from the high Danube terrace (dust loess without macropores, having layers of loess clay - buried soils). It is located under layer 1 with a thickness of 30 ÷ 33 m south of terrace T<sub>6</sub>, up to 32 m within the scope of terrace T<sub>6</sub> and up to 1.0 m within the boundaries of terrace T<sub>2</sub>;
- *Layer 1a* - collapsible loess I type (dust to dust-sandy loess, macro-porous, light yellow, with a fragile structure, having at places layers of loess). It builds the near-surface part of terraces T<sub>2</sub> and T<sub>1</sub> with a thickness of 5 ÷ 11 m;

- *Layer 2a* – non-collapsible (slumping) loess (clay loess, without macropores with a compact structure, highly humidified to saturated). It is found in terraces  $T_2$  and  $T_1$  with a thickness of  $2 \div 4$  m to  $8.0$  m;
- *Layer 3* - sandy clay, alluvial (sandy clay, beige and brown, sometimes with gravel pieces). It is found in the upper part of the alluvium with a thicknesses up to  $2.0 \div 5.5$  m within terraces  $T_6$  and  $T_2$  and with a thickness of  $2 \div 8$  m within terrace  $T_0$ ;
- *Layer 4* – gravel, alluvial (gravel or gravel sand with clay-sand (terrace  $T_1$ ) and sand filling (terraces  $T_1$  and  $T_0$ ). Within the boundaries of terrace  $T_6$  it usually has a thickness of  $1.0 \div 4.3$  m. In terraces  $T_1$  and  $T_0$  its thickness is variable - from  $2 \div 5$  m to  $8 \div 13$  m;
- *Layer 4a* - alluvial sand (small to medium sand, sometimes clay-sand). It is found in the low terraces  $T_1$  and  $T_0$  with a thickness of  $1.0$  m to  $3.3$  m in the form of lenses and strata in layer 4;
- *Layer 5* - dust clay, Pliocene (Brusarski Formation) – dust clay, solid, yellow-rusty, colorful to gray in depth with carbonate and single gravel pieces. It builds the footing of the terraces and most of the section of the suite. Its upper part is at elevations of  $48 \div 54$  m within the scope of terrace  $T_6$ ,  $24 \div 27$  m - within terrace  $T_2$ ,  $13 \div 19$  m – within terrace  $T_1$  and  $11 \div 17$  m - within the boundaries of terrace  $T_0$ . The thickness of layer 5 together with the sand layers and seams included in it (layer 6) is  $48 \div 52$  m within the boundaries of terrace  $T_6$ ,  $25 \div 26$  m - within terrace  $T_2$ , and  $20 \div 25$  m - within terrace  $T_1$ .
- *Layer 6* - Pliocene sand (Brusarski Formation) - small to medium or clay sand, beige to gray. It forms seams in the clays of Brusarski Formation (layer 5) with a thickness of  $0.5 \div 1.0$  m to  $12$  m;
- *Layer 7* - clay sand, Miocene (Archar Formation) - small clay sand, glaucous, aquifer, thixotropic. It is found below an altitude of  $(4.7)$  to  $(-8.6)$  m .;
- *Layer 8* - dust clay, Miocene (Archar Formation) – dust clay, solid, blue-grey, passing into clay marl.
- The following hydrogeological units are distinguished in the hydrogeological section of "Radiana" site: unsaturated (aeration) zone and saturated zone - groundwater body "Porous groundwater in Neogene – Lom-Pleven depression" code BG1G00000N2034 with upper layer in Brusarski Formation and bottom layer in Archar Formation.
- The clays of Smirna Formation play the role of regional aquitard. This formation has not been reached in the area of the site. It is composed of solid, practically watertight clays that are the lower aquitard of the aquifer sediments.

According to its geomorphology "Radiana" site can be provisionally divided into two sections - sloped section and flat section. Repository of trench type can be built in the two sections, i.e. within the boundaries of terrace  $T_6$  and within the boundaries of terrace  $T_2$ .

**In conclusion it can be said that the NRRAW is designed as a system of multiple barriers that will ensure the safe isolation of radioactive waste from the environment for a period of time until the radionuclides in the waste are hazardous to the living organisms. These barriers act consecutively, so that a failure in one or more barriers or their degradation over time is compensated by the retention capacity of the other barriers.**

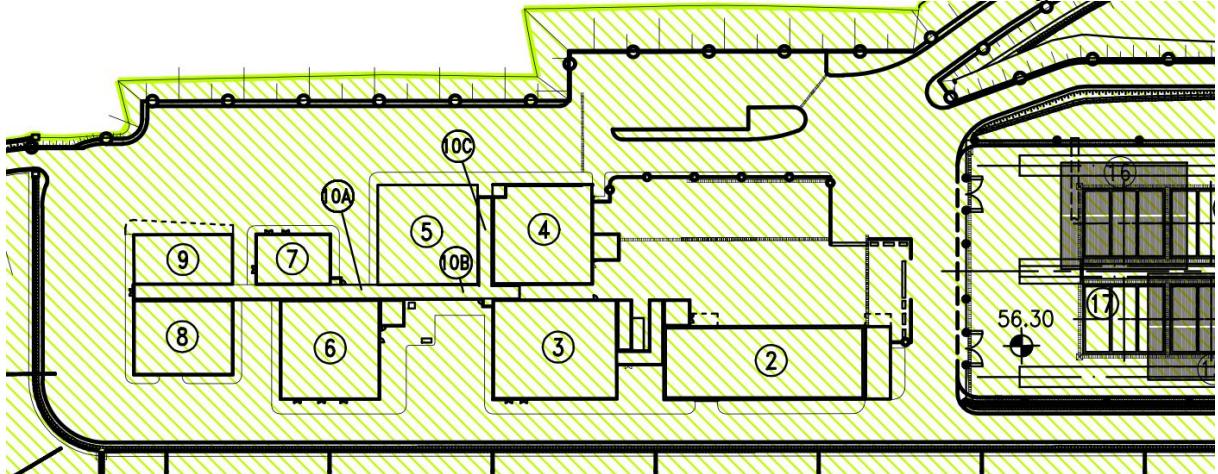
#### I.5.1.2 Auxiliary buildings and facilities.

Auxiliary buildings are located west of the repository, separately from the cells. The technical and administrative management and supervision of the operation of the NRRAW are carried out in the auxiliary buildings. Their location with respect to the NRRAW is designated in the appendixes to this Master Plan (*Appendix № 2*) and in **Figure № I-10** below.



Scheme with designated location of the main auxiliary buildings of NRRAW.

Figure № I-10



**Legend:** 2. Building for reception and temporary storage of packages of RAW; 3. Basic service building; 4. Building for physical protection and control room; 5. Administrative building; 6. Building of service systems; 7. Building of conventional (construction and other.) laboratories; 8. Workshops. 9. Garages.

The description of the buildings and basic equipment in them is as follows:

➤ Building for access control and portal for vehicles.

Located at the entrance of the NRRAW, in immediate proximity to the road to the site of Kozloduy NPP. The building for access control is designed as one-storey building with a direct link to the area of the portal for vehicles with a built-up area of 153.8 m<sup>2</sup>. The portal for vehicles consists of a roof, standing on reinforced concrete columns and located directly above the main road to the NRRAW. A built-in moving barrier is designed to prevent unauthorized entry and exit of vehicles at the site of the NRRAW.

The building is equipped with cameras for access control in the area of the entry / exit for visitors, a scanner for luggage, arches with radiation detectors and arches with metal detectors in the area of the entry / exit.

➤ Building for reception and temporary storage of packages of RAW (X).

The building for reception and temporary storage of packages of RAW is located in the controlled area. It is a one-storey massive building occupying an area of 750 m<sup>2</sup>. The foundation of this building is loess-cement "cushion". This is necessary because of the main functions of the building, which are:

- Admittance of vehicles for packages of RAW;
- Handling of packages of RAW;
- Inspection and control of packages of RAW;
- Deactivation of vehicles in the unlikely event of open radioactive surface contamination;
- Repair of minor damage to the packages of RAW;
- Temporary storage of passing packages of RAW, before and after their approval for burial;

The building provides an opportunity to arrange and optimize the flow of packages of RAW to the disposal cells and includes the following main areas:

- Area for loading/unloading of packages of RAW, which is equipped with two double electrically-driven and electronically controlled shielding doors, each with an electric block system. The premise is separated from the other areas of the building for the reception and temporary storage of packages of RAW by shielding walls and by a fire alarm and fire extinguishing system. This area is intended for deactivation of vehicles in

the unlikely event of radioactive contamination of the vehicles.

- Premises for inspection of packages of RAW intended to provide space for visual inspection and verification through a system of video surveillance of the power dose of packages of RAW;
- Area for temporary storage of packages of RAW. It is separated from the waiting and repair area by 4.5 m high shielding wall. It has a storage capacity of 120 packages of RAW, arranged in 2 levels of 60 packages each. Packages of RAW are stored in this area before being moved to the area for disposal;
- Area for waiting and repair of packages of RAW. It is separated from both sides from the area for temporary storage by a shielding wall with a height of 4.5 meters. The maximum number of packages of RAW, which can be placed in this area, is 3;
- Room for waste. It has a small area and is used to store solid radioactive waste subject to reduction in volume, such as protective equipment (personal protective equipment), materials from smear-tests, and the like, before being sent to the Kozloduy NPP for treatment and conditioning ;
- Corridor with control via monitors for surface radioactive contamination on the hands and feet;
- Electro room;
- Area for cleaning and drying of trucks for transportation of packages of RAW where the truck loaded with packages of RAW is subject to cleaning and drying of the external radioactively non-contaminated parts (wheels and bodywork), before entering the main building.

*The main equipment of this building* consists of an overhead crane, which moves along the building for reception and buffer storage of packages. The crane is used to unload incoming trucks with packages of RAW, facilitating their inspection, moving them to the area for temporary storage and later loading the packages of RAW on the transport platform to be transferred to the disposal area.

➤ Main service building (E).

*The main service building* is a massive one-storey building located between the controlled area and supervised area with a total area of 700 m<sup>2</sup>. The main function of the main service building is to control the supply of packages of RAW for disposal in the NRRAW. The building is divided into two areas with regard to the requirements for radiation control. These areas are respectively the controlled area and the supervised area.

The controlled area is used to locate facilities and carry out activities necessary to prove that the packages of RAW meet the criteria for acceptance and disposal in the NRRAW. Here are the premises for radiation control, a radiochemical laboratory with its auxiliary facilities - laboratory ventilated fireplaces, a system for liquid radioactive waste with its own shield tank (a separate system is provided for collection of all potentially radioactive liquids from the showers for decontamination, laboratories, drainage in the controlled area, etc.), warehouse for radiation protection and maintenance etc. Radioactive contamination in the controlled area is unlikely (i.e. there are no areas where the power of the dose is above permitted levels) and therefore it is not necessary to make a further separation of potentially radioactively contaminated areas. Although radioactive contamination of the surface is unlikely, the project provides for funds to facilitate the implementation of decontamination if necessary. The radiochemical laboratory is designed for analysis of swabs and different samples (including packages of RAW, samples from wastewater systems, etc.) as well as for analysis of samples from the environment.

The supervised area includes the premises and facilities necessary to support the activities carried out in the main service building, including premises for radiation protection of the staff, offices, locker rooms, laundry services and other service premises.

*The main equipment of the main service building includes: equipment for radiochemical laboratories, including pH meters, scales, conductivity meter, titrator, colorimeter, laboratory fireplaces and refrigerators; equipment for radiological analyzes, including NaI scintillator for gamma and X-ray spectroscopy, germanium detectors, gas proportional counter, liquid scintillation counter, alpha spectrometry system; equipment for radiation protection;*

➤ Building for physical protection and control room (H).

This is a massive one-storey structure located in the supervised area of the NRRAW with an area of 540 m<sup>2</sup>. It is designed for staff required for physical protection, technological safety and operational control of the NRRAW. It includes two departments with different functions:

- 1) Department of Physical Protection - intended to perform 24 hour control, supervision and monitoring of the facility. Continuous monitoring and supervision of the NRRAW during and after normal work shift is carried out through alarms and warnings, including: fire alarms, cameras and sensors for physical protection and alarm systems for perimeter violation, and alarms of radiation protection;
- 2) Department of the Main Control Room - intended to centralize all information and systems for control and supervision needed for the safe operation of the facility. Specifically, the Main Control Room is the place where the remote control is concentrated as well as the monitoring of the following systems:
  - Systems for handling of packages of RAW in the building for the reception and temporary storage of packages of RAW;
  - Systems for handling of packages of RAW in the area for disposal;
  - System for radioactive wastewater;
  - System for radiation control;
  - System for ventilation and air conditioning;
  - Fire alarm system;
  - Electrical systems;
  - Other auxiliary systems: for water supply and delivery of diesel fuel;

➤ Administrative building (J).

This is a one-storey massive structure, which covers an area of 550 m<sup>2</sup> in the supervised area of the NRRAW near the building for physical protection and the control room. The building is designed to support the implementation of the following functions:

- Management of the operation of the NRRAW;
- Computerised management of the storage of packages of RAW;
- Management of the staff of the NRRAW.

The administrative building includes offices, conference rooms, accounting, computer room and archive, storage for office supplies, bathroom. The building is supplied with office equipment, computer equipment and auxiliary tools (computer terminals, photocopiers, system for management of the packages of RAW, etc.).

➤ Building of the service systems (L).

The building is a one-storey structure located near the main service building (separated by an outer space) with an area of approximately 550 m<sup>2</sup> in the supervised area. In the building, in the respective premises, there are the necessary facilities to perform the following functions:

- Power supply equipment including transformer, electrical cabinets, switchboards and emergency diesel generator;

- The mechanical auxiliary equipment, including storage tank of drinking water and distribution pumps, boilers of the heating system of the site, water-cooling aggregates of the cooling system of the site, cold and hot water pumps for the heating systems, ventilation and air-conditioning, anti-fire water pumps and fuel pumps;
  - Additionally, in the outer area, next to the building, there is a water tank for fire fighting and a tank for diesel fuel, both located underground;
- Building of conventional (construction, etc.) laboratories (Z).  
One-storey building located in the supervised area on an area of 230 m<sup>2</sup>. It contains non-radiological or conditionally "clean" laboratories for activities that may be necessary for the implementation of the control on the facility of the NRRAW. It is designed for permanent jobs of 5 people. It consists of two laboratories with warehouses, an office and two rooms (rooms for electric and heating, ventilation and airconditioning installations) with an inside corridor. The building will be used to carry out environmental monitoring, storage and preparation of environmental samples.
- Workshops (F).  
One-storey building located in the supervised area on an area of 450 m<sup>2</sup>. The workshop consists of a machine workshop (with a channel for viewing), which has direct access to the electrical workshop, welding workshop, two storage rooms and interior corridors. The building has the following functions:
- Maintenance and repair of mechanical and electrical equipment;
  - Maintenance and repair of the vehicles used vehicles in the NRRAW;
  - Warehouse for spare parts;
- All activities carried out in the workshop building are with radioactively non-contaminated materials and equipment.
- Garages.  
One-storey building located in the supervised area. The building is designed to provide a covered parking area for the specialized vehicles. There are four compartments, one of which is intended for washing cars and trucks, and the remaining three – for parking of up to four cars or one truck in each of them. Each compartment has an independent entrance for vehicles. The building has a total usable area of 290 m<sup>2</sup>.
- Main corridor.  
The main corridor is a structurally independent building, providing connection and access for people and equipment to all buildings located in the area of the buildings, with the exception of the building for the reception and temporary storage of packages of RAW, which is connected through the main service building. The main corridor is a single-storey building with low (suspended) ceiling with a total built-up area of 416 m<sup>2</sup>. The space under the ceiling is intended for passage of personnel.  
The buildings of the auxiliary building stock will generally be equipped with the following systems:
- Water supply systems;
  - Sewerage systems;
  - Systems for heating, ventilation and air conditioning;
  - Fire alarm systems;
  - Operational phones and alarm system;
  - Electricity distribution systems;
  - UPS systems for uninterrupted power supply;
  - Compressed air systems, local;
  - Systems for liquid radioactive waste;



- Systems for radiological characterization;
- Network of the management systems;
- Systems for handling the packages of RAW in the building for reception and temporary storage;
- Radiation monitoring systems;
- Emergency system for supply of diesel fuel (including fuel tank, diesel generator, feed pumps, etc.).

**The premises in the auxiliary buildings, which are used for inspection, control and handling of packages of RAW and which might have radiation from radioactive substances, are protected by shielding walls and doors that prevent the radioactive radiation outside them and prevent the penetration of radiation in the environment and radioactive contamination of the area.**

### *1.5.2 Main processes in the implementation of the investment proposal.*

#### 1.5.2.1 Technological processes and operations during construction.

The construction period comprises the construction of auxiliary buildings and facilities of the NRRAW, and the construction and preparation of disposal cells for "Phase 1" (i.e. "Platform 1") and the subsequent two phases (i.e. "Platform 2" and "Platform 3"). The areas of construction and operation will be separated by a protective fence running between the cells of different phases. The construction activities will be completely separated from the storage activities and will not pose any risk of radioactive release or exposure of workers to direct radiation.

The construction period comprises the following main processes, operations and phases:

- Preparation of the respective construction area, including: cleaning the site of the auxiliary buildings and of the terrain of the respective platform of the NRRAW - removal of trees and shrubs, removal of the surface humus layer, excavation works, disposal of humus and soil (loess) etc.;
- Temporary construction - construction of temporary roads within the boundaries of the controlled and supervised areas, provision of power supply, water supply, provision of vans or temporary household containers for residence of the working personnel and the like;
- Excavation and shuttering works related to the construction of the foundations of the buildings and facilities and the foundation loess-cement base (cushion) of the respective platform of the NRRAW, building up of retaining walls and the like.
- Construction of the foundations of buildings and facilities and the foundation loess-cement base (cushion) of the respective platform of the NRRAW together with the system for control of infiltrated water and the system for deep drainage, construction of the foundations of the cells of the respective platform;
- Construction of the buildings, facilities and installations - auxiliary buildings, the cells on the respective platform, service systems, installations and additional facilities;
- At the same time, the supporting site infrastructure in both areas (controlled and supervised) will be built – power distribution network, water supply network, sewerage network, video surveillance and control, service roads and road links, levelling, landscaping;
- Equipment of the buildings and facilities - supply and installation of the necessary equipment and machinery to be used in the operation of the NRRAW;

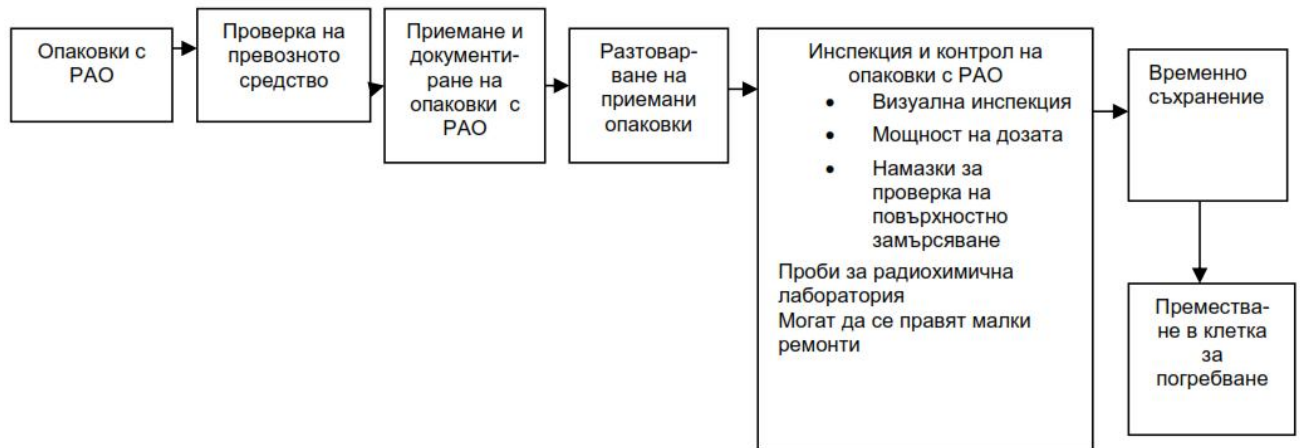
The duration of the main construction (auxiliary buildings, facilities and "Platform 1"): in the range of 2-3 years.



### I.5.2.2 Technological processes and operations during operation.

The main processes during the operation, which will be carried out at the site of the NRRAW, are schematically presented in **Figure № I-11**.

*Main processes during the time of operation of the NRRAW* **Figure № I-11**



In a more detailed aspect, the essential technological processes and operations during the operation of the repository, following the chronology of receipt of the packages of RAW until the closure of the cells, are as follows:

- Control of the access to the site of vehicles loaded with packages of RAW;
- Transportation to the parking area and drying of the vehicle (if cleaning and drying of the exterior and the wheels of the truck is necessary);
- Inspection of the documents accompanying the package of RAW in the premises for control of the incoming packages of RAW, located next to the building for reception and temporary storage of packages;
- Access road for the truck loaded with packages to the unloading area in the building for reception and temporary storage of packages of RAW;
- Unloading of the package of RAW from the vehicle and positioning on a rotating platform for inspection, using the overhead crane of the building, managed remotely from the Central Control Room;
- Check for surface radioactive contamination by taking smear-tests;
- Non-destructive characterization of the package of RAW (including determining the power of the dose, visual inspection and gamma spectrometry);
- Control of surface radioactive contamination of the truck before leaving the facility site;
- Moving the package of RAW from the area for inspection to the area for temporary storage or the area for waiting and repair, if necessary. The package is monitored by video surveillance systems and is positioned in the area for temporary storage in the designated place;
- Loading the package of RAW at the area for temporary storage onto an internal site-truck. For this purpose the overhead crane of the building for the reception and temporary storage is used, with the process being managed from the Central Control Room;
- Internal transport of the package of RAW to a disposal cell in operation, with a sliding roof being positioned above the cell;

- Placing the package of RAW in a disposal cell. The operation is performed by the overhead crane located in the sliding roof and is managed remotely from the Central Control Room;
- Control and verification of the identification of the package of RAW;
- Unloading and placement of the packages of RAW line by line, one on top of the other;
- The package of RAW is identified with the help of the video surveillance system and its position in the cell is localized. This information is managed by the system for tracking of packages of RAW at the repository;
- Final activities after filling the cell:
  - Closing the disposal cell.
  - Moving the sliding roof in a position above the adjacent cell.

#### I.5.2.3 Technological processes and operations during the closing of the cells and the closure of the repository.

The main processes and operations of the closing of the cells include:

- Stoking gravel to fill the gaps between the packages of RAW in order to prevent movement of the packages;
- By remote operation using the overhead crane, located under the sliding roof and the system for video surveillance, prefabricated concrete panels are placed on top of the cell walls;
- Placing a layer of polyethylene to prevent spillage and penetration of concrete between the covering concrete panels;
- Pouring of concrete levelling layer;
- Building a closing reinforced concrete slab (0.6 m);
- Waterproofing of the slab by using waterproof coating;

After filling the cells of the platforms with RCC and their closing, the decommissioning and closure of the repository follows. The period of closure, which is assumed to continue not more than 15 years, will include the following main processes and operations:

- Building multilayer coating of the modules;
- Removal of all waste generated by decontamination processes;
- Removal of all buildings, structures, systems and equipment that are not necessary during the period of institutional control;
- Removal of the construction waste generated during the removal of buildings and transportation to a specialized landfill;
- Updating the relevant archives of disposal with the final status;
- Technical reclamation by performing final backfilling of the repository with soil that was excavated from the site of the platforms and stored at "Radiana" site in such a way that the slope can regain approximately its original condition;
- Biological reclamation of the finally shaped slope by planting vegetation of the original species, with the surface over the disposal cells for RAW being subject to planting grass or species with shallow roots;

#### I.5.2.4 Activities after the operation period – period of institutional control.

The period of institutional control includes the following main activities:

- Control of the status of the facilities through periodic inspections and radiation monitoring of the site and infiltrated water during part of the period;

- Carrying out of preventive protective measures and monitoring, security and control of access;
- Carrying out potential activities of maintenance by repairing the unexpected damage to the coating;
- Application of administrative measures of control of the land use of the site throughout the entire period;

After the expiry of the period of institutional control the site will be released for unrestricted use, i.e. 300 years after the closure of the repository, since after this period the residual radioactivity of the buried RAW will no longer be an unacceptable radiological risk for the living organisms.

### *1.5.3 Delivery and service infrastructure – transport access and scheme of a new or change of the existing road infrastructure, water and sewerage, power supply.*

The infrastructure of "Radiana" site does not require large investments and is not associated with large-scale infrastructure activities, as it is located near the site of Kozloduy NPP, provided with all services and utilities.

#### 1.5.3.1 Transport access and road-transport network of the site.

"Radiana" site is accessible to its North by the road controlled by Kozloduy NPP, i.e. there is no need to build new access roads. This road will be used for transportation of conditioned radioactive waste from the Workshop for processing radioactive waste of the Specialized Unit of the State Enterprise RAW (SU RAW-Kozloduy). A main road and bypass roads will be constructed on the site itself. The location of the road from the NPP and the internal roads is designated in the attached Master Plan to the REIA (*Appendix № 2*).

The main access road will connect the road from Kozloduy NPP, which is the starting place of the waste, with the border-crossing checkpoint for access to the building for physical protection. There will be direct access of the waste to the building for reception and temporary storage of the waste, after passing a physical security.

Bypass road 2 is designed for the transportation of radioactive loads and people around the administrative area, giving priority to traffic patterns around the buildings.

The final access to the area for disposal will be via bypass road 1, which is parallel to the cells of the platform and at the same level. The construction of this road ends at the end of each stage of the construction of the repository and will continue during the next phase of construction of the NRRRAW.

There are also special roads to the pool for stormwater, the inlet of the inspection galleries and the area of the tanks of the network for control of the infiltration / for final control and the network for deep drainage.

The speed limit will be 30 km/h for all roads in order to avoid to the maximum possible degree accidents with the vehicles transporting packages of RAW.

#### 1.5.3.2 Power supply.

An overhead power line "ELBA" 20 kV, owned by CEZ, passes through "Radiana" site. The section of the overhead power line, passing through the site, will be moved in accordance with the instructions of CEZ, for which there is a detailed design. The site will be supplied with power by means of a deviation from the overhead power line. For this purpose, a power substation in accordance with the legal requirements will be provided.

#### I.5.3.3 Water supply.

The nature of the investment plan determines the need to provide only drinking water supply of the auxiliary buildings at the site to serve the needs of the staff working in them. Disposal of containers with conditioned RAW in the repository does not require provision of industrial water supply.

In this case, a water main of the drinking water supply network passes through "Radiana" site, which feeds Kozloduy NPP and which has sufficient capacity to cover the needs of drinking water during the construction, operation and closure of the NRRAW. For this purpose, the section of the water supply network, which passes through "Radiana" site, will be moved to the north between the fence of the site and the existing road, while maintaining the existing capacity for supply of Kozloduy NPP and providing a deviation for power supply of the NRRAW.

#### *I.5.4 Sewerage and wastewater treatment.*

There is no constructed or existing sewerage network at "Radiana" site. IP envisages constructing a separate sewer network: for household wastewater from the administrative area; for storm water; for infiltrated water from the cells of the repository; for drainage water from the repository.

##### I.5.4.1 Discharge and treatment of household wastewater

IP envisages constructing a separate sewerage system at "Radiana" site: for household wastewater and for storm water. Additionally, the following system will be provided for the flows for which there is a potential risk, however minimal, of radioactive contamination: "system for control and disposal of infiltrated water" "system for liquid RAW", "system for deep drainage".

##### I.5.4.2 Discharge and treatment of infiltrated water at the NRRAW.

Since there is some risk of infiltration of water into the cells of the NRRAW as a result of accidents during their filling, and after their filling and sealing, it is envisaged to construct a system for control and disposal of infiltrated water in the platforms of the repository. Water collected in the network for control and disposal of infiltrated water can come as a result of:

- Penetration of storm water due to damage of the sliding roof, under which the filling of the respective working cell will be performed;
- Occurrence of the phenomenon of capillarity in the cells and the sequence of processes of condensation and evaporation inside them. As a visible result, water appears in the cell;
- Small quantities of infiltrated water (if any), which has penetrated through the upper waterproofing coating of the sealed cells, in case this coating is defective or its integrity has been compromised invisibly as a result of negligence during the operations of its installation. Since this coating will be accessible until putting a multilayer coating upon the final closure of the repository, it can be easily repaired or replaced during the phase of the operation of the facility;
- Infiltration of small amounts of water during the period of institutional control of the repository as a result of a damage of the long term multilayer coating of the facility after its closure;

The system for control of infiltrated water at the NRRAW is planned to be in operation during the phases of construction, operation and institutional control in the course of 300 years,



with minimal maintenance. The system allows easy detection and localization of infiltrated water in the storage cells. To fulfill its functions, the pipelines of the system are located in accessible galleries, called galleries of the system for control of infiltrated water. As a whole, this network includes:

- For each disposal cell there is a pipe that collects the drainage of the bottom plate (from each of the 3 chambers of the cell) and is connected to the network for control of infiltrated water.
- A monitoring vessel is installed on the respective discharge pipe of each cell which collects the water and allows inspection for the presence of water;
- System of longitudinal ferro-concrete underground galleries of access, which is located under the two rows of cells - one gallery under each row of cells with a width of 1.20 m and height of 2.20 m along the east-west axis (*Figure № I-10*);
- Cross galleries at the ends of each platform, which serve as access points to the two longitudinal galleries that pass under the rows of cells. Each gallery has two independent entries for access;
- Sewer pipelines for collecting infiltrated water - in the longitudinal access galleries there are main sewer pipes, connected to the discharge pipes of the cells. In the underground galleries, parallel to the sewer pipes of the network for control of infiltrated water there are pipelines for collecting stormwater. In the period before the commissioning of the cells, their drains are connected to these pipelines. The transfer of the discharge pipe from a given cell to the network for control of infiltrated water is carried out immediately before the commencement of the works on the filling of the cell with packages of RAW;
- Pipes of the network of sewers in the galleries to a control collection tank;
- Control collection tank with a capacity of 100 m<sup>3</sup>, the volume of which is designed for the amount of infiltrated water in the cover of all cells for disposal for a year plus the water, corresponding to possible accident damage in the long-term multilayer coating under the conditions of average annual rainfall. The location of the site is designated in the attached Master Plan (*Appendix № 2*).

The pipes of the system are designed (with slope and dimensions) so that the flow is directed by gravity to the collection tank for infiltrated water.

The network for control of infiltrated water is independent of the network for collecting stormwater. The collected infiltrated water is subject to inspection for radioactivity before being released from the tank. The contamination of wastewater must be below the required limits for release. If the limits are exceeded, the water will be transported by specialized water tank outside the site to be treated in a specialized installation of the Specialized Unit Radioactive Waste (SU RAW) located in NPP Kozloduy (outside "Radiana" site). If radioactivity is below the permissible limits, the wastewater in the tank is released into the pool for collecting stormwater.)

#### I.5.4.3 Discharge and treatment of potentially radioactive wastewater (liquid waste) generated in the auxiliary buildings.

The collection, control and management of potentially radioactive wastewater generated in the premises of the buildings in the controlled area during the operation of the repository is planned to be carried out by a system for liquid radioactive waste. More specifically, the system is designed to collect by gravity, store and transfer potentially radioactive liquid waste generated in the main service building and the building for reception and temporary storage of packages of RAW. During normal operation this wastewater can be obtained from:

→ Drainage from the floors of various premises in the controlled area;

→ Drainage from washing dishes in the radiochemical laboratory;

Additional liquid radioactive waste can be obtained from the following activities:

→ Wastewater from cleaning and decontamination of contaminated equipment and vehicles;

→ Showers for decontamination of personnel;

→ Water from the fire sprinkler system in some of the premises in the packages of RAW and radiochemical laboratory);

**It is expected that the generated liquid radioactive waste will be very little - the maximum expected value is less than 1 m<sup>3</sup> per month** (the normal expected amount is about 0.41 m<sup>3</sup>/month).

Potentially radioactive wastewater generated during the normal operation in some of the premises of the two buildings mentioned above is planned to be discharged by gravity through drainage pipes to two storage tanks located in the basement near the main service building. Only one of the tanks will receive wastewater, while the other one will be in reserve, for release. The capacity of reservoirs allows separation of collected wastewater and its management.

Before the transfer or release operations, wastewater will be homogenized in the reception tank and samples will be taken. The system has a pump for circulation and transfer of wastewater. The recirculation pipe has an extension for taking samples for analysis of the liquids before being discharged from the tanks. Depending on the degree of contamination, water will be discharged from the tanks in the following directions:

- Transfer of radioactive wastewater to a mobile tank, located in the area of vehicles in the building for reception and temporary storage of packages of RAW, for subsequent treatment at a site in Kozloduy NPP, if the contamination of the liquids is above the permissible limit;
- Transfer of wastewater in the nearest manhole of the stormwater sewer in the controlled area of the buildings to the pool for collecting stormwater for further control and release if the contamination of the liquid is within acceptable limits;

The system for liquid radioactive waste will be managed remotely from the Central Control Room by using a local programmable controller. The tanks will be equipped with controlling and measuring devices for visualization of the level in the Central Control Room and alarm for high and low level.

#### I.5.4.4 Discharge and treatment of drainage water.

A "deep drainage system" is envisaged for collection and disposal of stormwater, which may be collected around the important underground structures, such as the base of the cells for storage of RAW. It consists of permeable underground horizontal pipes installed on top of a layer of filtering material, which provide a way for discharge of groundwater. There are two pipes located longitudinally under each row of cells. The pipes are placed in a trench covered with concrete panels, thereby providing access for repair. Water collected in the pipe network is discharged into a tank - tank for deep drainage with capacity of 100 m<sup>3</sup>, located next to the tank of the infiltration control system. Water from the tank for deep drainage is controlled by taking samples before being released into the pool for stormwater or transferred into a cistern for further treatment in a specialized installation (outside "Radiana" site), depending on the degree of contamination of the collected drainage water.

It is estimated that the operation of the network for deep drainage is of critical importance during the stage of operation, before putting the long-term multi-layer coating since it prevents groundwater to reach by infiltration the structures dug into the ground. Also, during the stage of

institutional control, if some amount of water passes through the long-term coating, which is unlikely, it is subject to collection in the deep drainages.

I.5.4.5 Discharge and treatment of surface water formed as a result of rainfall - discharge of stormwater and a stormwater collection pool.

*I.5.4.5.1 Discharge of stormwater.*

In order to ensure controlled discharge of the surface runoff at "Radiana" site, formed as a result of rainfall, and to minimize the infiltration of water through the soil, it is envisaged that the site will be encircled by a free-flow network for stormwater collection. The network consists of open sewers of cast concrete, covered or not by grids of galvanized steel, straight PVC or HDPE pipes, PVC pipes in the network of drainage and inspection galleries, revision manholes, ditches and shafts for stormwater and a collection pool for this water.

Stormwater that has fallen on the closed and sealed disposal cells of platforms 1, 2 and 3 (including: cells, sliding roofs, road lanes around the cells, bypass road 1) and on the observed part of the building platform (including: roofs, sidewalks and a stretch of bypass road 2) is discharged by means of sewers and pipes for stormwater to the stormwater collection pool.

Stormwater, which has fallen in the open cells before putting them into operation (i.e. after their construction and before filling them with packages of RAW), is discharged through PVC pipelines located within the network of drainage and inspection galleries and via underground PVC pipelines to the stormwater collection pool. During the period prior to the operation of the cells, their drains are connected with the pipelines for stormwater collection, and the transfer of the pipe from a given cell to the network for control of water infiltration is carried out immediately before the commencement of the works on the filling of the cell with packages of RAW.

Stormwater, which has fallen on the slopes outside the platforms, is collected by rectangular open sewers located on the upper and lower boundary of the slopes and is discharged into the separate sewerage network of the site.

Stormwater, which has fallen on the roofs of the buildings, is collected through gutters and discharged through drain pipes, attached to the walls of the buildings into the sewage network of the site.

*I.5.4.5.2 Stormwater collection pool.*

The pool for collecting stormwater is planned to be an open concrete tank located on waterproof geomembrane of high-density polyethylene on excavated valley in the form of tapered pyramid in the lowest part of "Radiana" site. Geotextile will be placed under the geomembrane in order to avoid piercing. Water of different origin will be collected into the pool, and will be checked before being released as a conventional water. The pool will collect the flows from:

- Clean water from the tank of the system for control of infiltrated water where the collected water quantity will be checked before being taken to the combined pool for stormwater collection;
- Clean water from the tank of the deep drainage system where the collected water quantity will be checked before being taken to the combined pool for stormwater collection;
- Empty cells of a given platform before putting them into operation, i.e. before they are filled;

- Surface water described in the preceding subsection (incl. from the surface of the cells, which are filled, sealed and covered with waterproofing);

**Samples will be taken from the water collected in the stormwater collection pool before it is released. It may be released only if its contamination is below the permissible limits for release into the environment. In the event that these limits are not exceeded, the water will be removed from the pool and transferred outside the site for treatment, i.e. in the specialized installation of SU RAW, located on the site of Kozloduy NPP. If the values are within the permissible limits, the water will be discharged into the stormwater sewer of NPP Kozloduy.**

#### *1.5.5 Personnel required for the operation of NRRAW and regime of work.*

Personnel of about 51 people will be needed to operate and manage the repository during its operation. Additional personnel will be required to ensure the security of the site on a continuous basis, i.e. 24 hours a day, 7 days a week, throughout the year. It is estimated that 6 people of security personnel will be needed for each shift. Additionally, 15-20 people will be employed temporarily for the operations of the closing of the cells.

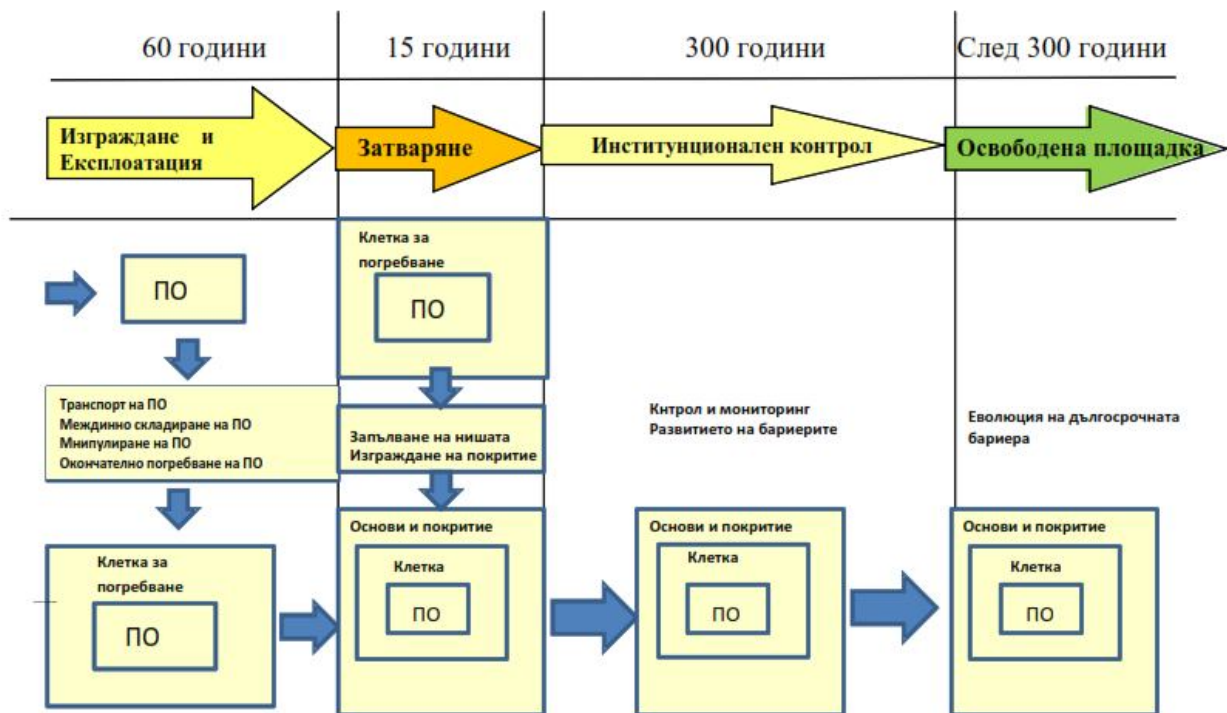
NRRAW will have the following regime of work: one shift a day with an 8-hour working day and 5-day working week.

#### *1.5.6 Stages and period of implementation of the Investment Proposal.*

According to the project design, the investment proposal can be provisionally divided into several main stages, which are presented with their respective timelines in **Figure № I-1**.below.



Figure № I-12.



#### I.5.6.1 Brief characteristics of the stage of construction and operation of NRRAW.

The stage of *construction* of the NRRAW envisages a phased construction approach, consisting of three phases, i.e. "Phase 1", "Phase 2" and "Phase 3". During the first phase of construction it is necessary to complete all buildings, which are operatively connected with the NRRAW, as well as the first group of 22 disposal cells. The NRRAW will be fully operating after completion of "Phase 1". The subsequent phases 2 and 3 will be completed at intervals of about 20 years. These phases of construction will increase the capacity for disposal of waste in the NRRAW by 22 additional cells. They will be implemented in such a way as not to interfere with the operation of the NRRAW. For the purpose, separate access roads will be used for the construction and the areas where construction will take place, and they will be separated by a fence from the NRRAW. Disposal of waste can begin after the completion of "Phase 1" and after the NRRAW receives a license to operate. The second and third phases will expand the facility to reach its full capacity. The cells in the process of construction will be isolated from the cells in operation by means of a physical barrier, so that the access to the area of construction will be through a separate and independent entrance. Standard construction techniques and materials will be used during the construction of the NRRAW (concrete, reinforcement of concrete work, bricks, paint, etc.), which will be subject to strict control for availability of certificates of quality and additional sampling, both by the construction supervision and by SE "RAW". Additionally, SE "RAW" is planning to carry out quality control of construction activities using non-destructive methods.

The *operation*, i.e. the reception and disposal of the packages of RAW and the closure of the disposal cells is expected to last 60 years, starting with the reception of the package of RAW and ending with all cells being filled and closed (i.e. "Phase 1", "Phase 2" and "Phase 3"). The activities begin with the reception and handling of the packages of RAW, which represent a double engineering barrier, with the main processes of operation being described in subsection I.5.2.2 of the Report on the assessment of the degree of impact (RADI). The packages of RAW are designed and manufactured following the specifications in accordance with their safety

functions. The disposal cells are built on site, as one step of the activities at the facility. Then they are filled and sealed with a ferro-concrete slab. This is repeated until all disposal cells are built, filled and closed. All operations in the facility will be carried out and controlled in such a way as to maintain the integrity of the packages of RAW during their handling and to prevent falling and also to minimize the risk of damage to the packages of RAW by extraordinary events such as fire and explosions. During operation, the radiological risk is managed directly, being actively controlled by professionals in radiation protection of the site and by automatic radiation monitoring systems, operating under strict regulatory supervision. The criteria for acceptance of waste include such restrictions, and they are based on the assessment of the operational safety and assessment of the safety for an extended period of time.

#### I.5.6.2 Brief characteristics of the stage of closure of NRRAW.

The period of closure will start after all cells of the facility have been built, filled and closed and is expected to last up to 15 years. It includes the filling of the volumes between the disposal cells and construction of a multi-layer coating as described in subsection I.5.1.1.3, as well as the decommissioning of the auxiliary buildings of the NRRAW and of the supporting facilities. The multi-layer coating provides protection of the buried waste from adverse weather conditions and is built in such a way as to ensure that the coating remains sufficiently watertight at least throughout the period of institutional control. The only radiological risk during the stage of closure is the direct radiation from the closed disposal cells. Since the cell walls provide a sufficient shield for the radiation, this risk is practically absent. After the multi-layer coating is placed on the disposal cells, the repository will be subject to technical and biological reclamation, as a result of which it will be completely covered with soil and vegetation. During the technical reclamation the soil that was excavated from the place of the platforms and stored at "Radiana" site will be laid in such a way that the slope will regain approximately its original condition.

#### I.5.6.3 Brief characteristics of the stage of institutional control of NRRAW.

During the period of institutional control, which lasts 300 years, the entire multi-barrier system will be functioning and its operation will be monitored by periodic inspections of its integrity as well as by controlling the infiltrated water (if any), collected in the network for control of infiltration. Eventually, it may be necessary to conduct some maintenance activities through repairs of unexpected damage to the coating. Environmental protection is provided by the above-mentioned multi-barrier system for retention of radionuclides, together with the limitation of the specific activity and the general activity of the NRRAW.

The defined safety function of the disposal cells is virtually complete retention of potentially released radionuclides from packages of RAW, by maintaining the integrity of the cells in a reasonably achievable degree for a period of 300 years after the closure of the NRRAW. After expiration of this period the site will be released for unrestricted use, since afterwards the residual radioactivity of buried RAW will not constitute an unacceptable radiological risk for the living organisms.

The NRRAW is actually designed as a system of several barriers that will ensure the safe isolation of radioactive waste from the environment for a period of time until the radionuclides in the waste are hazardous to the living organisms. These barriers act consecutively, so that a failure of one or more barriers, or their degradation over time, is compensated by the retention capacity of the other barriers.

#### *1.5.7 NRRAW capacity.*

The NRRAW should provide capacity for the disposal of all radioactive waste of category 2a, generated in Bulgaria by the operation of the NPP, by other nuclear facilities, by the use of radionuclides for scientific, medical and industrial purposes. These include:

- **Liquid RAW** subject to additional concentration by evaporation and to conditioning by cementing - cubic residue resulting from the treatment and concentration of different types of radioactively contaminated water, generated by the operation of the power plant, spent ion-exchange resins and sorbents;
- **Solid waste** - contaminated clothing and personal protective equipment, contaminated equipment and tools, earth, construction waste, laboratory waste;

The repository will not be used for burial of spent nuclear fuel generated by the operation of the reactors of Kozloduy NPP and by other power plants, and generally it will not be used for any high-level waste (HLW).

As described above, the NRRAW is a modular facility to be constructed in stages, the first of which consists of 3 main phases. "Phase 1" is intended to provide capacity for disposal of about 50,000 m<sup>3</sup> solid and conditioned liquid RAW. Preliminary estimates indicate that the total disposal capacity of the facility is a maximum of 138,200 m<sup>3</sup> (345,500 tons) of RAW, which corresponds to 18,615 packages of RAW. On the other hand, the design capacity of the repository amounts to 142,000 m<sup>3</sup> or 19,008 packages. It should be noted that a maximum of 18,615 packages is expected, as the additional capacity of the repository up to 19,008 packages is a function of the construction of the cells and the whole available volume.

It is envisaged that the daily productivity of the NRRAW will be 3 to 4 RCC per day. The maximum annual productivity will be 800 RCC, determined on the basis of reception of RAW 200 days per year, taking into account the fact that RAW is transported only on weekdays, and that there will be no transport in case of adverse weather conditions.

#### *1.5.8 Brief overview of the types of non-radioactive and radioactive solid waste that will be generated during the construction, operation and closure of the NRRAW and method of management.*

##### *1.5.8.1 Types of waste that will be generated during the construction of the NRRAW and method of management.*

It is expected that household and construction waste, redundant earth (soil), industrial and some hazardous waste will be generated during the construction of the NRRAW, the service buildings and the related infrastructure, as follows:

- *Household waste* generated by the construction personnel, which will be collected in a container provided at the site and will be subsequently disposed at the landfill for non-hazardous household and industrial waste (Regional landfill for non-hazardous waste-RLNW - Oryahovo)
- *Construction waste* (mixtures of concrete, bricks, roof-tiles, faience and ceramic products)
  - a relatively small amount of waste generated by the construction, which will be collected in the designated areas for construction waste and will be subsequently disposed at RLNW - Oryahovo.
- *Earth masses - loess and soil materials* from the excavation works for the foundations of the buildings and platforms of the repository. They will be disposed at the designated terrains within the boundaries of "Radiana" site, and subsequently the loess (about 90,000 m<sup>3</sup>) will be used for the construction of the *loess-cement cushion of the*

repository, one part of the soil materials (about 68,0000 m<sup>3</sup>) will be used for levelling of the site and the remaining – for the reclamation of the repository during the period of its closure, so that the proposed management of excess earth masses will minimize their negative impact on the environment and respectively on the biodiversity at the site of the IP;

- *Industrial non-hazardous waste* (paper and cardboard packaging, plastic packaging and mixed packaging) - from materials and equipment that will be transferred to a specialized company for further treatment;
- *Hazardous waste* - waste oils from the construction machinery, which will be collected in the designated vessels at the site and will subsequently be transferred to external licensed companies for further treatment.

#### I.5.8.2 Types of waste that will be generated during the operation of the NRRAW and method of management.

During the operation it is expected to generate non-radioactive waste: household waste, construction and industrial waste, hazardous waste in relatively small quantities and radioactive waste in minimum quantities, as follows:

✓ *Non-radioactive solid waste:*

- *Mixed household waste* generated by the staff, in the amount of approximately 32 m<sup>3</sup> per year, which will be first collected in a container at "Radiana" site until it is filled and will be later transported and disposed at RLNW - Oryahovo;
- *Construction waste* (mixtures of concrete, bricks, roof-tiles, faience and ceramic products) – incidentally in case of repair during the operation; it will be transported to RLNW - Oryahovo;
- *Industrial non-hazardous waste – packaging (paper, cardboard, plastic and mixed packaging)* from materials and equipment in the expected quantity, which will be collected at the site of the IP for temporary storage and will be transferred to a company for further treatment;
- *Hazardous waste* - burned mercury and fluorescent lamps (fluorescent tubes and other mercury-containing waste) in the amount of about 20 units/year. It will be stored temporarily in closed premises with limited access in specially designed containers for such waste. Subsequently it will be transferred to a licensed company for disposal, which will periodically take it from the place for temporary storage, using its own transport.

✓ *Radioactive solid waste:*

- *Personal protective equipment* (protective clothing, shoes, gloves) - they will be in relatively small quantities - not more than 40 sets per year and will be transported by specialized vehicles for treatment to the existing installations of SU RAW (facilities for radioactive waste processing) outside "Radiana" site. After packaging in RCC they will be transported back to the repository for disposal.

#### I.5.8.3 Types of waste that will be generated during the closure of the NRRAW and method of management.

During the decommissioning of the NRRAW it is expected to generate:

- *Non-radioactive waste* - mostly construction waste and a limited amount of household and non-hazardous industrial waste, which will be treated in the same way as during the stage of construction.



- *Radioactive waste* - not expected to be generated during the period of closure of the NRRAW.

## **II. DESCRIPTION OF THE CHARACTERISTICS OF OTHER PLANS, PROGRAMS AND PROJECTS / INVESTMENT PROPOSALS (PPP/IP), EXISTING AND/OR UNDER CONSTRUCTION OR APPROVAL, WHICH IN COMBINATION WITH THE EVALUATED INVESTMENT PROPOSAL MAY HAVE ADVERSE IMPACT ON PROTECTED AREAS.**

In general, a more significant adverse cumulative impact on the purpose and subject of protection of the four protected areas, as a result of the construction, operation and post-operation period (stage of institutional control) of the NRRAW, might occur as a result of future implementation of other PPP/IP in the area of "Radiana" site in the following direction:

- similar investment proposals, which are related in some way with the use of radioactive materials and the generation of some radioactive radiation;
- future nearby implementation of larger-scale industrial production, which is subject to a mandatory environmental impact assessment or a competent authority has decided that such an assessment is necessary;
- construction of more significant building sites (large-scale construction of buildings) or sites with energy (e.g. wind farms and photovoltaic plants) and economic purpose, whose construction leads to the generation of noise and other emissions, and coincides in time with the construction of the site in consideration, with an environmental impact assessment required for them as well;

It should be noted that with regard to PA BG0002009 "Zlatiyata", PA BG0000533 "Ostrovi Kozloduy", PA BG0000614 "Reka Ogosta", PA BG0000508 "Reka Skat", no **cumulative effect** can be expected, which is **associated with increased immediate/direct pressure on the areas (increase of the direct damage as a result of losses of areas in them due to absorption within the zones)**, as all types of areas and facilities of the NRRAW are outside the four areas and are far enough from them – the first one is located at a distance of 0.45 km southwest of the external border of "Radiana" site, the second one - 3.8 km to the north, the third one - 6 km to the east and the fourth - 6.3 km to the east. In this situation, the implementation of the IP, with respect to some of the components of the four areas, could generate only indirect negative cumulative impacts in combination with other PPP/IP. Apart from the projects located in the area of "Radiana" site, it is also necessary to take into account those that are close in nature to the IP in consideration or are related to the implementation of projects, which are the sources of significant emissions that fall within the protected areas, partially affect them or are in close proximity of them.

**In accordance with the guidelines provided in letter № B-1701/12.08.2014 of RIEW-Vratsa**, included in *Appendix № 6* to this assessment, *Table № 2.1* and *Table № 2.2* below provide information about the PPP/IP found on the website of the information system of protected areas in Natura 2000 network, and on the websites of MEW and RIEW-Vratsa, as well as the projects planned by the SE RAW according to data obtained from it, with whose implementation the IP in consideration could have a potential adverse cumulative impact on the subject and purpose of the PA in consideration. The tables also include projections about the expected cumulative impact.

Table № 2.1

PPP/IP, which are located in the area of "Radiana" site and, in combination with the implementation of the assessed IP, could have an adverse impact on the protected areas in consideration.				
№	Site, PPP, Investment proposal	Potentially affected protected areas	Potential impacts	Analysis of the causes and the potential cumulative impact of the implementation of the IP in consideration
1	Investment proposal for the decommissioning of units 1 ÷ 4 of Kozloduy NPP.	PA BG0002009 "Zlatiyata", PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River", PA BG0000508 "Skat River", PA BG0000527 "Kozloduy" and PA BG0000199 "Tsibar"	The IP has a prepared REIA with attached to it RADI, supplemented by a <b>positive decision № 8-6/2013</b> of the MEW, which states that no significant negative impact is expected on the subject and purpose of protection in the nearest protected areas.	<b>No direct cumulative impact</b> (loss of area, fragmentation, and the like) in the protected areas can be expected, as both IP are outside the PA and do not treat areas within their boundaries. Serious and significant indirect cumulative impact can not be expected, in view of the absence of significant impacts on the areas as a result of the decommissioning of units 1÷4 of Kozloduy NPP. It must be taken into account that the NRRAW is mainly built with the purpose of disposal of the processed and conditioned low- and intermediate-level RAW of category 2a, generated as a result of the decommissioning of the first four units of Kozloduy NPP, which will terminate their storage in the used warehouses for temporary storage of the plant, thus fulfilling all the requirements for their safe disposal and minimizing the risk of radiation impacts on the nearest PA as a result of the occurrence of various incidents. In this regard, the implementation of both IP is associated with and leads to a positive impact. We cannot talk about a cumulative negative impact because practically we only have a change of the place of storage of low- and

Table № 2.1

PPP/IP, which are located in the area of "Radiana" site and, in combination with the implementation of the assessed IP, could have an adverse impact on the protected areas in consideration.				
№	Site, PPP, Investment proposal	Potentially affected protected areas	Potential impacts	Analysis of the causes and the potential cumulative impact of the implementation of the IP in consideration
				intermediate-level RAW in the region of Kozloduy NPP, in a most safe modern facility - NRRAW. The transport vehicles will not pass through or near the PA – the transport will be within the secured area of the NPP along the inter-plant road.
2	Investment proposal for "Construction of new nuclear power capacity of the latest generation at the site of Kozloduy NPP".	PA BG0002009 "Zlatiyata", PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River"	The IP has a prepared REIA with attached to it RADI, which states that the IP is compatible with the subject and purpose of protection in the three protected areas and, provided that the specified mitigation measures are undertaken, it can be implemented, assuming that it will have no significant adverse impact on the subject and purpose of protection therein.	No direct cumulative impact (loss of area, fragmentation and the like in the PA) can be expected, as both IP are outside the PA and do not treat any areas within their boundaries. No serious or significant indirect cumulative impact can be expected either, given the expected absence of significant impacts on the PA as a result of the implementation of new nuclear power capacity (NNPC). It must be taken into account here that the NRRAW will also be used for reliable disposal of the processed and conditioned low- and intermediate-level RAW, generated during the operation of the new reactor, i.e. it will have a kind of auxiliary functions related to its servicing. In the absence of the NRRAW, this waste is subject to temporary storage in the

Table № 2.1

PPP/IP, which are located in the area of "Radiana" site and, in combination with the implementation of the assessed IP, could have an adverse impact on the protected areas in consideration.				
№	Site, PPP, Investment proposal	Potentially affected protected areas	Potential impacts	Analysis of the causes and the potential cumulative impact of the implementation of the IP in consideration
				warehouses for temporary storage of the plant, where the waste from the decommissioning of units 1÷4 of Kozloduy NPP is stored.
3	Project: "Construction of a facility for treatment and conditioning of radioactive waste (RAW) with high coefficient of volume reduction (HCVR) at the site of Kozloduy NPP".	PA BG0002009 "Zlatiyata", PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River", PA BG0000508 "Skat River", PA BG0000527 "Kozloduy" and PA BG0000199 "Tsibar"	The IP has a prepared REIA with attached to it RADI, supplemented by a <b>positive decision № 2-2/2014</b> of the MEW, which states that no significant negative impact is expected on the subject and purpose of protection in the nearest protected areas.	No direct cumulative impact (loss of area, fragmentation and the like in the PA) can be expected, as both IP are outside the PA and do not treat any areas within their boundaries. No serious or significant indirect cumulative impact can be expected either, given the absence of significant impacts on the PA as a result of the construction and operation of the facility for treatment and conditioning of RAW with HCVR at Kozloduy NPP. No indirect adverse cumulative impact can be expected, on the contrary - the facility will be used for treatment by using a plasma technology of low- and intermediate-level RAW subject to disposal in the NRRAW, which is associated with a reduction of the volume and their safe disposal, thus freeing spare capacity in the repository and avoiding the use of the warehouses for temporary



Table № 2.1

PPP/IP, which are located in the area of "Radiana" site and, in combination with the implementation of the assessed IP, could have an adverse impact on the protected areas in consideration.

№	Site, PPP, Investment proposal	Potentially affected protected areas	Potential impacts	Analysis of the causes and the potential cumulative impact of the implementation of the IP in consideration
				<p>storage of RAW at the plant, while meeting all requirements for their entirely safe disposal. The risk of radiation impacts on the nearest PA resulting from the occurrence of various incidents will also be minimized.</p> <p>In this regard, the implementation of both IP is closely linked and we cannot talk about any adverse cumulative impact, as the operation of the facility will contribute to the extending of the operation lifetime of the NRRAW and the avoiding for a longer period of time of any potential renewal in the future of the collection and accumulation of low- and intermediate-level radioactive RAW in the warehouses of the NPP, after the decommissioning of the NRRAW.</p>
4	Project: "Construction of a repository for dry storage of spent nuclear fuel (RDSSNF) at the site of Kozloduy NPP".		The IP has a prepared REIA with attached <b>positive decision № 14-7/14.12.2006</b> of the MEW. The Nuclear Regulatory Agency (NRA) has issued permit № 3571 dated 24.11.2011 for the commissioning of the RDSWNF. Its final	<p>There can't be any direct cumulative impact (loss of area, fragmentation and the like in the protected areas), as both IP are outside the PA and do not treat any areas within their boundaries.</p> <p>No serious or significant indirect cumulative impact can be expected during the operation of</p>

Table № 2.1

PPP/IP, which are located in the area of "Radiana" site and, in combination with the implementation of the assessed IP, could have an adverse impact on the protected areas in consideration.

№	Site, PPP, Investment proposal	Potentially affected protected areas	Potential impacts	Analysis of the causes and the potential cumulative impact of the implementation of the IP in consideration
			commissioning is expected in November 2014, after the NRA has issued a license for its operation. The construction of the NRRAW is scheduled to begin in 2015.	the two projects since, according to the REIA of the RDSWNF, the facility will be used for safe and environmentally reliable storage of waste fuel from Kozloduy NPP (by a system of storage with containers). Its contribution to the background radiation in the vicinity of the town of Kozloduy from external radiation is negligible and is at least 4 orders of magnitude smaller than the contribution of the other facilities at the NPP, and the area of potential impact is limited to the fenced site of Kozloduy NPP, outside of which is located the NRRAW, i.e. within the boundaries of the site with the repository no radiation overlay with other radiation sources and respectively no cumulative impact on the PA can be expected.
5	Project: "Supply of equipment for treatment of liquid RAW ("Danube installation") at the site of Kozloduy NPP".	PA BG0002009 "Zlatiyata", PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River", PA BG0000508 "Skat River", PA BG0000527 "Kozloduy" and PA BG0000199	This project is part of the IP for decommissioning of units 1÷4 of Kozloduy NPP, therefore the potential impacts of its implementation should have been taken into account in the prepared REIA and RADI, approved by <b>decision № 8-6/2013</b> of MEW,	Since the project is part of the IP already discussed at the beginning of the table, the possible cumulative impact of its implementation should be part of the cumulative impact of the overall implementation of the two main IP.

Table № 2.1

PPP/IP, which are located in the area of "Radiana" site and, in combination with the implementation of the assessed IP, could have an adverse impact on the protected areas in consideration.				
№	Site, PPP, Investment proposal	Potentially affected protected areas	Potential impacts	Analysis of the causes and the potential cumulative impact of the implementation of the IP in consideration
		"Tsibar"	which has already been mentioned above.	
6	Project: "Mobile equipment for decontamination and purification of the water from reactors at the site of Kozloduy NPP".	No	According to a letter by MEW ref. № 26-00-2555 to Kozloduy NPP, the project could not be referred to the investment proposals set out in Appendices 1 and 2 to the EPA and is therefore not subject to environmental impact assessment, i.e. it is not associated with adverse impacts on the components of the environment and, respectively, with adverse impacts on the nearest PA.	There can't be any direct or indirect negative cumulative impact on the closest PA, given that the IP is associated with the decontamination and purification of the water from the reactors at the site of Kozloduy NPP, i.e. the impacts in terms of radioactive radiation and respectively in terms of the impacts on environmental components (including the living organisms) are rather in a positive direction.
7	Project: "Facility for extraction and immobilization of spent ion-exchange resins in Kozloduy NPP".	PA BG0002009 "Zlatiyata", PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River", PA BG0000508 "Skat River", PA BG0000527 "Kozloduy"	This project is part of the IP for decommissioning of units 1÷4 of Kozloduy NPP, therefore the potential impacts of its implementation should have been taken into account in the prepared REIA and RAD, approved	Since the project is part of the IP already discussed at the beginning of the table, the possible cumulative impact of its implementation should be part of the cumulative impact of the overall implementation of the two main IP.

Table № 2.1

PPP/IP, which are located in the area of "Radiana" site and, in combination with the implementation of the assessed IP, could have an adverse impact on the protected areas in consideration.				
№	Site, PPP, Investment proposal	Potentially affected protected areas	Potential impacts	Analysis of the causes and the potential cumulative impact of the implementation of the IP in consideration
		and PA BG0000199 "Tsibar"	by <b>decision № 8-6/2013</b> of MEW, which has already been mentioned above.	
8	Project: "Facility for extracting and processing of the solid phase of the tanks with concentrate from the evaporators in Kozloduy NPP".	PA BG0002009 "Zlatiyata", PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River", PA BG0000508 "Skat River", PA BG0000527 "Kozloduy" and PA BG0000199 "Tsibar"	This project is part of the IP for decommissioning of units 1÷4 of Kozloduy NPP, therefore the potential impacts of its implementation should have been taken into account in the prepared REIA and RADI, approved by <b>decision № 8-6/2013</b> of MEW, which has already been mentioned above.	Since the project is part of the IP already discussed at the beginning of the table, the possible cumulative impact of its implementation should be part of the cumulative impact of the overall implementation of the two main IP.
9	Project: "Measuring equipment for release from control and monitoring of waste in Kozloduy NPP".	PA BG0002009 "Zlatiyata", PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River", PA BG0000508 "Skat River", PA BG0000527 "Kozloduy" and PA BG0000199 "Tsibar"	The implementation of the project is not associated with adverse impacts on protected areas since the installation and operation of the facilities is not associated with generation of pollutants into the environment – the case in point is the delivery and operation of measuring devices, which do not generate any emissions. Moreover, this project is part of the already mentioned	The case in consideration refers to measuring devices, which are not sources of hazards to the environment, but are rather intended for registering such hazards. Therefore, no cumulative impact whatsoever could be expected from such devices.



Table № 2.1

PPP/IP, which are located in the area of "Radiana" site and, in combination with the implementation of the assessed IP, could have an adverse impact on the protected areas in consideration.				
№	Site, PPP, Investment proposal	Potentially affected protected areas	Potential impacts	Analysis of the causes and the potential cumulative impact of the implementation of the IP in consideration
			IP for decommissioning of units 1÷4 of Kozloduy NPP.	
10	Project: "Supply of equipment for control of liquid and gaseous discharges from Kozloduy NPP".	PA BG0002009 "Zlatiyata", PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River", PA BG0000508 "Skat River", PA BG0000527 "Kozloduy" and PA BG0000199 "Tsibar"	The implementation of the project is not associated with adverse impacts on protected areas since the installation and operation of the facilities is not associated with generation of pollutants into the environment – the case in point is the delivery and operation of measuring devices, which do not generate any emissions. Moreover, this project is part of the already mentioned IP for decommissioning of units 1÷4 of Kozloduy NPP.	The case in consideration refers to control equipment, which is not a source of hazards to the environment, but is rather intended for registering and controlling such hazards. Therefore, no cumulative impact whatsoever could be expected from such equipment.
11	Project: "Construction of a workshop for size reduction and decontamination of materials (WSRD) in Kozloduy NPP".	PA BG0002009 "Zlatiyata", PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River", PA BG0000508 "Skat River", PA BG0000527 "Kozloduy" and PA BG0000199 "Tsibar"	This project is part of the IP for decommissioning of units 1÷4 of Kozloduy NPP, therefore the potential impacts of its implementation should have been taken into account in the prepared REIA and RAD, approved by <b>decision № 8-6/2013</b> of MEW, which has already been mentioned above.	Since the project is part of the IP already discussed at the beginning of the table, the possible cumulative impact of its implementation should be part of the cumulative impact of the overall implementation of the two main IP.

Table № 2.1

PPP/IP, which are located in the area of "Radiana" site and, in combination with the implementation of the assessed IP, could have an adverse impact on the protected areas in consideration.

№	Site, PPP, Investment proposal	Potentially affected protected areas	Potential impacts	Analysis of the causes and the potential cumulative impact of the implementation of the IP in consideration
12	Project: "Design and construction of sites for management of materials from the activities of decommissioning of units 1-4 of Kozloduy NPP".	PA BG0002009 "Zlatiyata", PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River", PA BG0000508 "Skat River", PA BG0000527 "Kozloduy" and PA BG0000199 "Tsibar"	This project is part of the IP for decommissioning of units 1÷4 of Kozloduy NPP, therefore the potential impacts of its implementation should have been taken into account in the prepared REIA and RAD, approved by <b>decision № 8-6/2013</b> of MEW, which has already been mentioned above.	Since the project is part of the IP already discussed at the beginning of the table, the possible cumulative impact of its implementation should be part of the cumulative impact of the overall implementation of the two main IP.
13	Project: "Construction of a heating station for the production of steam and hot water at the site of Kozloduy NPP".	PA BG0002009 "Zlatiyata", PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River", PA BG0000508 "Skat River".	According to letter of RIEW-Vratsa (ref. № B-1214/29.07.2009), the investment proposal is subject to a mandatory EIA. Therefore, REIA and RAD should have been prepared for the project, specifying the degree of the potential impact on the environment and the nearest PA under Natura 2000. As of this point in time, there is no data that such reports have been deposited for quality assessment (according to the	In the case, this project should not be considered since, as mentioned in the previous column, it has been terminated.

Table № 2.1				
PPP/IP, which are located in the area of "Radiana" site and, in combination with the implementation of the assessed IP, could have an adverse impact on the protected areas in consideration.				
№	Site, PPP, Investment proposal	Potentially affected protected areas	Potential impacts	Analysis of the causes and the potential cumulative impact of the implementation of the IP in consideration
			Public Register with data for carrying out EIA procedures). Given that, according to para. 4, item 1 of Art. 2a of the Ordinance on EIA, the procedure, and the IP respectively, should be considered terminated because the contracting authority has failed to implement the instructions provided by the competent authority under Art. 5 para. 1 of the Ordinance in due time, which is 12 months (IP was announced in 2009).	

Table № 2.2				
PPP/IP, which are located in the territory of the protected areas in consideration and, in combination with the implementation of the assessed IP, could have an adverse impact on these areas.				
№	Site, PPP, Investment proposal	Affected protected areas	Potential impacts	Analysis of the causes and the potential cumulative impact of the implementation of the IP in consideration

1	Closure of the existing landfill for solid household waste in the town of Kozloduy.	PA BG0002009 "Zlatiyata"	The closure of the landfill is associated with technical and biological reclamation. This should be considered a positive aspect regarding the subject and purpose of protection of the area, given the termination of pollution of its parts with waste.	The biological reclamation is associated with the restoration of plant habitats in the area, which will create positive conditions for the settlement on the reclaimed terrain of animal species (including some birds) that inhabit it, i.e. in this case positive impacts could be expected for the region and possibly on a part of the subject of protection of PA "Zlatiyata", and no cumulative negative impacts could be expected on it as a result of the reclamation with the simultaneous construction and operation of the NRRAW.
2	Initial afforestation of non-agricultural lands in the village of Hayredin.	PA BG0002009 "Zlatiyata"	There is a risk to change the nature of some habitats in the area and of the composition of animal species, inhabiting them.	No cumulative impact is expected as the implementation of the NRRAW is associated with clearing the site of trees, among which there are many invasive species - acacia, honey locust and other that can quickly spread in the area. In this case, the afforestation of non-agricultural lands in the village of Hayredin has a completely opposite effect compared to the removal of the artificially planted acacia vegetation within the boundaries of the construction sites in the NRRAW. Thus, with respect to the adjacent areas of PA "Zlatiyata" it can be stated with certainty that their afforestation has a compensating character with regard to the release of afforested areas within the terrain of the NRRAW, i.e. we have two completely opposite impacts that are impossible to cumulate.



3	Fish farming in the existing micro-dam in the village of Butan.	PA BG0002009 "Zlatiyata"	Fish-breeding in the lake, regarding some birds attached to water areas, can have positive impacts on their nutritional base in the region, given that the provision and maintenance of a constant volume of water in the micro-dam is a prerequisite for the development of a number of aquatic organisms, including amphibians, which are part of the food base of such birds. In principle, the artificial maintenance of fishery resources in such micro-dams helps their conservation as such sites in view of the fact that very often they are subjected to draining by poachers through breakthroughs	No cumulative impact is expected since the implementation of the NRRAW does not treat any aquatic habitats (artificial or natural) and the corresponding birds attached to them. The potential impacts of the two IP are quite different in nature, which precludes their possible combination and cumulation with regard to identical classes of land cover, habitats and species in PA "Zlatiyata" and in the surrounding area. Furthermore, fish-breeding in the micro-dam can have positive impacts on the food base of certain birds in the area, which are attached to water areas.
4	Main repair of restaurant "The Three Pines" in the village of Hayredin and assembly of 6 bungalows.	PA BG0002009 "Zlatiyata"	IP is territorially located in a settlement. There is an issued Decision № VR-20-PR/2009 dated 14.04.2009 for this IP not to carry out EIA since the activities of overhaul and installation have long been implemented and therefore the potential indirect impacts on the area have long been terminated.	The activities of the overhaul of the restaurant and the installation of the bungalows have long been completed; therefore it is not possible for them to overlap in time with the future construction and operation of the NRRAW and to cumulate with regard to any potential impacts on PA "Zlatiyata". Moreover, this case concerns a completely different type of habitats and respectively of birds that could possibly be attached to them, i.e. no significant cumulative impact can be expected with regard to habitats and bird species.

5	Rubble extraction from the bed of Ogosta River, correction of Ogosta River in the land of the village of Hayredin.	PA BG0002009 "Zlatiyata"	The IP affects the river bed of Ogosta River, passing through the territory of PA "Zlatiyata" under Birds Dir. (outside PA "Ogosta Rive" - under Habitats Dir.). In practice, gravel extraction is mainly associated with the disturbance and displacement of some target bird species in the area of the IP as a result of the noise and increased anthropogenic pressure, however this impact is small, given its possible small perimeter of manifestation.	No impact is expected, as the implementation of NRRAW does not treat any aquatic habitats (artificial or natural) and has no relation to species of birds attached to such habitats. Rather it affects a forest area, which is related to other species of birds (inhabiting forested areas). Given this situation, no cumulative impact can be expected on forest and aquatic habitats in the area and outside it with regard to bird species attached to this type of habitat. We should also take into account the sufficient territorial remoteness of the NRRAW from the PA, which makes it impossible for any significant hazards (noise, dust, etc.) to reach it, and which could cumulate in the PA with those from the land of the village of Hayredin, located at a distance of about 13 km in a straight line from "Radiana" site.
6	Reconstruction and renovation of sheep farm for breeding 500 animals.	PA BG0002009 "Zlatiyata"	The Investment intention was announced in 2009, and there is an issued Decision № VR-37-PR/2009 dated 02.09.2009 not to carry out EIA since the activities on restoration and renovation of the sheep farm have already been implemented and therefore the potential impacts on the area have long been terminated.	The activities on the restoration and renovation of the sheep farm have long been implemented and therefore cannot overlap in time with the future construction and operation of the NRRAW and thus be cumulated with regard to any potential impacts on PA "Zlatiyata".

7	IP "Construction of protective retaining wall to strengthen the left bank of Ogost River" and IP "Building a protective embankment at Ogosta River and security channels for flood protection".	PA BG0002009 "Zlatiyata"	The first IP was announced in 2008, and there is an issued Decision № VR-28-PR/2008 dated 11.07.2008 not to carry out EIA. For the second IP there is an issued Decision № VR-33-PR/2010 dated 27.10.2010 not to carry out EIA, as the activities of the construction of the above-mentioned facilities have long been implemented and therefore the potential impacts on the area have long been terminated.	The activities of the construction of the two facilities have long been completed; therefore they cannot overlap in time with the future construction and operation of the NRRAW and be cumulated with regard to any potential negative impact (noise, dust, displacement of species, etc.) in PA "Zlatiyata". Moreover, this case concerns a completely different type of habitat (aquatic areas in Ogosta River and a forest habitat on the terrain of NRRAW) and respectively the birds attached to them, i.e. no significant cumulative impact on habitats and bird species can be expected.
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8	Construction of "Ogosta 4" MHPP in the bed of Ogosta River in the land of the village of Hayredin, Hayredin Municipality, in the land of the village of Kriva Bara and the village of Butan, Kozloduy Municipality, in the land of the village of Sofronievo, Mizia Municipality, Vratsa District.	PA BG0002009 "Zlatiyata"	As of this point in time, out of the three mentioned facilities, only "Elena" MHPP has been constructed and operating, while the other two have been dropped as IP, subject to implementation (incl. due to the expiry of the legal period of the decision on EIA, which is valid for 5 years /Art . 93, paragraph 7 of the EPA /). In this case, the activities of the construction of the operating MHPP have already been implemented and therefore no adverse impacts can be expected as a result of the construction. The mere operation of the MHPP is not related to wooded areas, such as the area where the NRRAW is located and is not associated with generating any significant hazards to the environment. On the contrary, since the MHPP is of a river-bed type, very favorable conditions are formed in the reservoir volume behind the dam for the stay of waterfowl, including birds that are subject to protection in the area.	In this case, there are no prerequisites for overlapping of the hazards generated during the construction of the MHPP with the construction of the NRRAW since the plant has long been completed. The mere operation of the MHPP has no relation to afforested areas, such as that where the NRRAW is located. In this situation, no cumulative impact can be expected during the simultaneous operation, since the implementation of the NRRAW does not treat any aquatic habitats (artificial or natural) and has no relation to bird species attached to them. Rather, it affects a forest area, which is related to other bird species. Furthermore, the reservoir volumes in the river-bed MHPP provide food base and other appropriate conditions for a number of birds attached to water areas, including waterfowl – subject to conservation in PA "Zlatiyata", which can be considered a kind of positive impact on the subject and purpose of the particular protected area.
9	Construction of "Ogosta 5" MHPP in the bed of Ogosta River in the land of the village of Hayredin and in the land of the village of Manastirishte, Hayredin Municipality, Vratsa District.			



10	Construction of "Elena" MHPP in the bed of Ogosta River in the land of the village of Hayredin, Vratsa District.			
11	Construction of a wind farm "Valchedram" in the land of the village of Gorni Tsibar, village of Zlatiya, Razgrad, village of Cherni Vrah, village of Septemvriyski and the town of Valchedram.	PA BG0002009 "Zlatiyata"	Since the implementation of the IP has not commenced within a period of 5 years from the date of entry into force of the decision on EIA (Art. 99, para 8 of the EPA), the decision (№ MO2-2/2009 of RIEW- Montana) has lost its legal action, and therefore the investment proposal can be considered terminated.	No cumulative impact is expected as a result of the termination of the investment proposal.

12	"Construction of a wind farm by installing 55 WEA" in the land of the town of Oriahovo and the land of the village of Selanovtsi, Oriahovo Municipality.	PA BG0000614 "Ogosta River"	The main risk is associated with the utilization and destruction of areas of habitats subject to conservation in the area and those outside it, as well as areas of some target animal species. In this case, according to the RAD of the IP, the terrains that are affected are mostly lands used for intensive agriculture, mainly for cereals, and to a small extent covers open areas, some of which represent natural habitat 6250 * Pannonian loess steppe grassland communities and habitats of hamster. The artificially forested area within the scope of the NRRW is not related to such habitats.	No cumulative impact is expected, since the implementation of the NRRW does not affect any open areas around the region with a nature of habitat 6250* and suitable for habitation by the hamster. Rather, it affects an area occupied by an artificial forest vegetation of introduced species. In this situation, no increase in the affected area in the region can be expected with respect to the forest and open habitats in the area and outside it, nor any additional impacts on the animal species attached to these two completely different types of habitats. Near the site of the IP there are no such habitats that may be affected indirectly. The simultaneous operation of the wind farm and the NRRW is not able to generate impacts that can be combined and cumulated with regard to the species subject to conservation in the area.
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13	"Construction of MHPP at Ogosta River with capacity of 530 Kw" in the land of the village of Hurlets, Kozloduy Municipality	PA BG0000614 "Ogosta River"	<p>These two IP have not been implemented and have been dropped as ones subject to implementation:</p> <ul style="list-style-type: none"> <li>- The first one has been dropped because of the expiration of the legal period of 5 years under Art. 93, para. 7 of the EPA of the decision of whether EIA is required (Decision № VR-32-PR / 2007 dated 09.07.2007).</li> <li>- For the second IP the EIA procedure was officially terminated by Decision № VR-5-P / 2013 dated 04/11/2013.</li> </ul>	In this case, these IP should not be considered because, as mentioned in the previous column, they have been terminated.
14	"Construction of Glozhene MHPP at Ogosta River" in the land of the village of Glozhene, Kozloduy Municipality.			

15	"Construction of fish farm for breeding sturgeon" in the land of the village of Saraevo and the land of the town of Mizia.	PA BG0000508 "Skat River"	According to Decision № VR-09-PR/2010 of RIEW-Vratsa, "The implementation of the IP is not likely to affect, destroy or fragment natural habitats and habitats of species subject to conservation in PA" Skat River". "The implementation of the planned activities is not expected to lead to any adverse impact on the populations of the species subject to conservation in the protected area or to their disturbance". "The IP is not expected to generate emissions or waste in form and amounts that could have a negative impact on the protected area."	No impact is expected, as the implementation of the fishery is not associated with impacts on target habitats and species in the PA and outside it, i.e. even in the presence of any potential indirect impacts on the area as a result of the implementation of the NRRAW, they are not subject to cumulation with the adverse impacts from the farm since such impacts are practically absent. Moreover, the two IP treat completely different types of territories (respectively habitats) - the farm will be turned into arable fields, while the NRRAW will be turned into an artificially afforested area with introduced and somewhat invasive species, therefore no cumulative impact can be expected with regard to the loss of similar-type habitats in the region as a whole.
16	"Correction of Skat River in the area of the town of Mizia", in the land of the town of Mizia.	PA BG0000508 "Skat River"	The IP was announced in 2007, and there is an issued Decision № VR-29-PR/2007 dated 26.06.2007 not to perform EIA since the activities on the correction of the river in the urban part of the town of Mizia have long been implemented and the potential adverse impacts on the area have long been discontinued.	The activities on the correction of the river have long been implemented and the impacts on the riverbed have been discontinued, therefore it is not possible for the future construction and operation of the NRRAW to be cumulated with the IP in this position of the table with regard to any potential adverse impacts (noise, dust, displacement of species, etc.) in PA "Skat".

17	"Building embankment on Skat River" in the land of the village of Krushovitsa, Mizia Municipality.	PA BG0000508 "Skat River"	The IP was announced in 2007, and there is an issued Decision № VR-26-PR/2007 dated 08.06.2007 not to perform EIA since the activities on the correction of the embankment have long been implemented and the potential adverse impacts on the area have long been discontinued.	The activities on the construction of the embankment have long been implemented, and the impacts on the riverbed and the protected area have been terminated, therefore it is not possible for the future construction and operation of the NRRAW to be cumulated with the IP in this position of the table with regard to any potential adverse impacts (noise, dust, displacement of species, etc.) in PA "Skat".
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An independent analysis is made below with regard to the potential cumulative impacts of the implementation of the NRRAW with the possible implementation of the PPP/IP listed in *Table № II.2* for each protected area separately. Initially, analysis has been made of the expected cumulative impact on the individual components and environmental factors of the PPP/IP to be implemented in the region of the site of Kozloduy NPP (*Table № II.1*) with regard to the NRRAW. The identified impacts on each component determine the possible cumulative impact on the subject and purpose of the conservation of protected areas, since these components are included in the composition of these areas.

### ***II.1 Analysis of the expected cumulative impacts in the area of the IP as a result of its simultaneous implementation with the established IP/PPP at the site of Kozloduy NPP.***

According to the analysis made above in *Table № II.1*, the following IP/PPP are listed for the site of Kozloduy NPP:

- Investment proposal for the decommissioning of units 1÷4 of Kozloduy NPP, with the following projects in its composition (including those listed in *Table № II.1*):
  - Project: Delivery of equipment for treatment of liquid RAW ("Danube installation") at the site of Kozloduy NPP;
  - Project: Facility for extraction and immobilization of spent ion-exchange resins in Kozloduy NPP;
  - Project: Facility for extraction and processing of the solid phase from the tanks with concentrate from the evaporators in Kozloduy NPP;
  - Project: Measuring equipment for release from control and monitoring of the waste in Kozloduy NPP;
  - Project: Delivery of equipment for control of liquid and gaseous discharges from Kozloduy NPP;
  - Construction of Workshop for size reduction and decontamination of materials (WSRD) in NPP Kozloduy;
  - Project: Design and construction of sites for management of materials from the activities of decommissioning of units 1-4 of Kozloduy NPP;
- Investment proposal for "Construction of new nuclear power capacity of the latest generation at the site of Kozloduy NPP";
- Project: "Construction of a facility for treatment and conditioning of radioactive waste (RAW) with high coefficient of volume reduction (HCVR) in Kozloduy NPP";
- Project: "Construction of a repository for dry storage of spent nuclear fuel (RDSSNF) at the site of Kozloduy NPP";

In this case, the above-listed investment proposals, projects and activities related to their implementation are intended to be implemented within the boundaries of the operational industrial site of Kozloduy NPP. Given the nature of these projects (described in column 3 of *Table № II.1*), in non-radiation aspect their implementation is not associated with a significant in quantity or scope cumulative impact on the components of the environment - air, soil, geological environment, water, biodiversity, etc., because on the one hand they are not associated with the generation of organized industrial polluting discharges - various types of gas-dust emissions and wastewater from production and processing processes, indiscriminate disposal of large quantities of solid waste outside the locations intended for this purpose and the like, and on the other hand, they are located within the already established and utilized by concreting industrial site, including to a large degree in the existing buildings on the site. In this case, local cumulative impacts of a temporary and weak character can occur mainly within the scope of that site as a result of the combination of noise with noise and of fugitive dust

emissions with fugitive dust emissions during the simultaneous implementation of some assembly and disassembly activities in the open territory of the site as a result of the parallel operation of machinery. Anyway, similar activities constantly accompany the activities related to the operation of Kozloduy NPP. In fact, the cumulative effects of the above-mentioned combinations with the highest possible degree can be expected on the main operating industrial site of the NPP, as all IP are focused on it, and NRRAW is located nearby (in the guarded area), while the four areas in consideration remain outside the potential scope given the distances to them. For example, regarding the fugitive dust emissions, it is known that they have a limited impact on the air since they are spread at small distances from the source (10-20 m in still air, depending on the concentration of particulate matter), because they are cold (with ambient temperature), with high gravity deposition rate and small height of release height (they are generated close to the ground). Regarding the noise, it is known that doubling the distance (e.g., relative to the location with the highest overlay) and depending on the height of the sources, the noise is reduced by 3 ÷ 7 dB (A) and the area at the nearest PA "Zlatiyata" is at a distance of about 0.5 km, while the NPP site is located in a lower terrain compared to area, with the slope towards it playing a shielding role because of its large displacement (about 60 m according to Google Earth Pro) and because of the presence of a forest cover, i.e. whatever the cumulative impact in the perimeter of implementation of the relevant IP, there will be no additional noise pollution in the area beyond the existing level in its territorial scope.

In this case, given the nature of the relevant IP/PPP, the potential cumulative impact in radiation aspect is of greater interest. In this connection, here we examine the cumulative dose exposure to all possible radiation in the area of the NPP.

The maximum annual effective dose of the living organisms in the 30 km area of Kozloduy NPP, resulting only from aerosol emissions during normal operation of the existing and new nuclear capacity, is estimated at 1.94  $\mu\text{Sv/a}$ . This is only 0.08% of the exposure to the natural background radiation in the country (2.33 mSv/a) and 0.2% of the standard rate for the population (1 mSv/a) – according to the Regulation on Basic Standards for Radiation Protection (RBSRP)-2012.

The maximum annual effective dose of the living organisms in the 30 km area of Kozloduy NPP, resulting only from liquid emissions during normal operation of the existing and new nuclear capacity, is estimated at 0.94  $\mu\text{Sv/a}$ .

The radiation impact on living organisms under normal operation of the NRRAW is analyzed in IRSA<sup>1</sup>, exclusively because of the presence of external radiation, since no gaseous and liquid emissions from the NRRAW are expected under normal operation. This impact is localized within the boundaries of the site of the NRRAW and virtually has no cumulative impact on the living organisms in the monitored area. The total annual dose is set at 18  $\mu\text{Sv}$  ( $\approx 0.02$  mSv) of direct radiation and is well below the secondary limit (100  $\mu\text{Sv/a}$ ) for the NRRAW.

The received assessments of the dose impact of discharges from Kozloduy NPP are fully comparable with the world practice according to official UN data (UNSCEAR-2000, 2008).

The following has been taken into account for the conservativeness of the assessment of the cumulative impact of the dose loading of the living organisms within the 30 km area of Kozloduy NPP by all radioactive releases into the environment under all operating conditions of the NPP:

- NRRAW - "Radiana" site;
- 5 and 6 unit, Repository for waste fuel (RWF), Repository for dry storage of spent nuclear fuel (RDSSNF);

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<sup>1</sup> Interim Report on Safety Analysis (IRSA), R5-NDF-ISA\_Rev1, Consortium Westinghouse – DBE Technology – ENRESA. March 11, 2013.

- from all activities of decommissioning of units 1÷4 (Workshop for size reduction and decontamination of materials /WSRD/);
- from emissions from the operation of the burning plasma facility (BPF);
- from new nuclear power capacity (NNPC) - maximum value for EUR limits of discharges.

The maximum annual effective dose of the living organisms in the 30 km zone of Kozloduy NPP, including the site of the NRRAW, even under this highly conservative (practically impossible) scenario for a reference individual, permanently residing at the border of the site of the NRRAW, as a result of all radioactive emissions in the environmental in cumulation with all nuclear facilities on the site of NPP units 5 and 6, decommissioning of units 1-4, BPF, NNPC and NRRAW, is estimated to be 20.88  $\mu\text{Sv/a}$ , which is much lower than the quota of 100  $\mu\text{Sv/a}$  for NRRAW, 250  $\mu\text{Sv/a}$  for exposure to radioactive releases from nuclear power plants (Regulation on ensuring the safety of nuclear power plants (Prom. SG. issue 66 of 30 July 2004., last amend. SG. issue 5 of 19 January 2010) and the standard rate for the population 1000  $\mu\text{Sv/a}$  (RBSRP-2012). The resulting additional dose loading is about 100 times lower than that of the natural background radiation (2330  $\mu\text{Sv}$ ) in the country.

It can therefore be concluded that the natural background radiation within the scope of the four areas will be affected in a negligible degree.

The individual doses of all radioactive discharges in cumulation at the NRRAW with all operating nuclear facilities at the site of Kozloduy NPP: decommissioning of units 1÷4 (Workshop for size reduction and decontamination of materials /WSRD/), as well as all future IP: burning plasma facility (BPF) and new nuclear power capacity (NNPC) have a maximum value of 20.88  $\mu\text{Sv}$ .

These doses are **much lower** than the threshold set under Art. 10 of RBSRP-2012 as a limit of the annual effective dose, which is 1000  $\mu\text{Sv}$ .

On this basis, it can be **firmly** stated that there is **no risk of deterministic effects** (harmful to the living condition effects from the impact of ionizing radiation) for the living organisms within the 30 km zone of the NPP.

## ***II.2 Cumulative impact within protected area "Zlatiyata" with code BG0002009, declared for conservation of wild birds under Directive 2009/147 / EC.***

The expected cumulative impact for the area of PA "Zlatiyata" with code BG0002009 as a result of the implementation of the NRRAW in combination with the mentioned PPP/IP in the area has the following features:

- IP for "Closure of the existing landfill for solid household waste in the town of Kozloduy". The existing municipal landfill for solid household waste of Kozloduy municipality is located within the land of the town. It is situated about 5 km west of the town. It is built on the southern slope of a nameless gully with erratic water runoff. To the north it is bordered by arable lands and to the south – by the layout of the gully, above which there are over 20-25 m high loess hills with almost vertical slopes. At present, the existing landfill is not fenced, there is no checkpoint and 24-hour security guard, there is no developed external infrastructure - no power supply, water supply or organized removal of surface- and storm-water and it does not meet the EU environmental requirements for the status of regulated landfills for solid household waste. The dumping site on the territory of Kozloduy Municipality needs to be aligned with the legal requirements for prevention of the adverse impacts on the environment and comply with the objectives set out in the National Waste Management Program. According to the land division plan, property № 000 587 with an area of 41 decares is earmarked for municipal landfill. The process of closing the landfill

consists of the following activities: 1. Analysis of the current state of the components of the environment; 2. Pre-disposal of part of the waste in a common body with stable slopes outside the landfill; 3. Building 4 gas wells, located at a distance of 50 m from each other; 4. Technical and biological reclamation. The biological reclamation is planned to be carried out after completion of the technical reclamation and includes a complex of agrochemical, technological and ameliorative measures for the creation of conditions for plating grass and trees. The biological reclamation can be provisionally divided into the following types of activities: a. Melioration activities – mineral fertilization, planting grass and trees; b. Growing activities - mineral fertilization; activities for maintaining the humidity of the grown vegetation; mowing of grass vegetation. The implementation of the project will lead to the closure of the existing landfill of the town of Kozloduy and reclamation of the terrain in accordance with the requirements for reclamation of disturbed terrains. In accordance with the published documentation, the deadline for technical reclamation is 8 months, including the construction of the monitoring equipment, and for the biological reclamation - 3 years. The biological reclamation is associated with the restoration of plant habitats in the area, which will create positive conditions for the settlement on the terrain of animal species that inhabit this part of the country, i.e. in this case we can expect positive impacts for the region and possibly on part of the subject of protection of PA "Zlatiyata" and we cannot expect any negative cumulative impacts on the area as a result of the reclamation with the simultaneous construction and operation of the NRRAW and other mentioned IP/PPP at the site of the NPP.

- IP for "Initial afforestation of non-agricultural land in the village of Hayredin". The afforestation of non-agricultural land in the village of Hayredin has a completely opposite impact compared to the removal of the artificially planted acacia vegetation within the construction sites on the NRRAW. Thus, regarding the adjacent areas of PA "Zlatiyata" we can state in this case that the afforestation has a compensating character with regard to the release of afforested areas within the terrain of the NRRAW, i.e. we have two completely opposite impacts that are impossible to cumulate. The impacts from the other IP at the site of the NPP do not affect forest areas.
- IP for "Growing fish in the existing micro-dam in the village of Butan". The envisaged activities in the existing micro-dam in the village of Butan, related to fisheries, have no tangent points with the activities related to the construction and operation of the NRRAW, which does not have water development nature and does not treat artificial or natural water bodies. Therefore, there aren't any types of impacts from the two IP that could cumulate to identical types of land cover, habitats and species in PA "Zlatiyata" and in its surrounding area. Furthermore, fish-breeding in the dam, with regard to some birds attached to water areas, can have positive impacts on their nutritional base in the region, given that the provision and maintenance of a constant volume of water in the micro-dam is a prerequisite for the development of a number of aquatic organisms, including amphibians (i.e. besides fish), which are part of the food base of such birds.
- IP for "Overhaul of restaurant complex "The Three Pines" in the village of Hayredin and installation of 6 bungalows". The investment intention was stated in 2009, and has an issued Decision № VR-20-PR/2009 dated 14.04.2009 not to carry out EIA since the activities of overhaul and assembly have long been implemented and therefore cannot overlap in time with the future construction and operation of the NRRAW and be cumulated with respect to any potential impacts on PA "Zlatiyata". Moreover, this case affects a completely different type of habitats and respectively of birds attached to them, i.e. no cumulative impact can be expected on habitats and species.
- IP for "Extraction of gravel from the river bed of Ogosta River, correction of Ogosta River in the village of Hayredin". IP affects the river bed of Ogosta River (i.e. the habitats of

waterfowl species), passing through the territory of PA "Zlatiyata" under the Birds Dir. (outside PA "Ogosta River" – under the Habitats Dir.). In practice, the extraction of gravel is mainly associated with the disturbance and displacement of some target bird species from the area of the IP as a result of noise and increased anthropogenic pressure. However, this impact is weak, given its possible small perimeter of manifestation. The implementation of the NRRAW does not affect any aquatic habitats (artificial or natural) and has no relation to species of birds attached to such habitats. Rather, it affects an area with forest character, which is related to other species of birds, inhabiting forested terrains. Therefore, no significant cumulative impact could be expected on forest and aquatic habitats in the area and outside it, or on bird species attached to this type of habitat.

- IP for "Reconstruction and renovation of sheep farm for breeding 500 animals" in the land of the village of Hayredin, Hayreidn Municipality. The Investment intention was announced in 2009, and there is an issued Decision № VR-37-PR/2009 dated 02.09.2009 not to carry out EIA since the activities on restoration and renovation of the sheep farm have already been implemented and therefore cannot overlap in time with the future construction and operation of the NRRAW and thus be cumulated with regard to any potential impacts on PA "Zlatiyata".
- IP for "Construction of protective retaining wall to strengthen the left bank of Ogosta River" and IP "Building a protective embankment at Ogosta River and security channels for flood protection". The first IP was announced in 2008, and there is an issued Decision № VR-28-PR/ 2008 dated 11.07.2008 not to carry out EIA. For the second IP there is an issued Decision № VR-33-PR/2010 dated 27.10.2010 not to carry out EIA, as the activities of the construction of the above-mentioned facilities have long been implemented and therefore their construction cannot overlap in time with the future construction and operation of the NRRAW and be cumulated with regard to any potential negative impact (noise, dust, displacement of species, etc.) in PA "Zlatiyata". Moreover, this case concerns a completely different type of habitat (aquatic areas in Ogosta River and a forest habitat on the terrain of NRRAW) and respectively the birds attached to them, i.e. no significant cumulative impact can be expected on similar-type habitats and bird species.
- IP for Construction of "Elena" MHPP, "Ogosta 4" MHPP and "Ogosta 5" MHPP in the river-bed of Ogosta River (Decision on EIA №, № 22 PR/2008, 58-PR/2008 and 59-PR/2008 not to carry out an EIA). As of this point in time, out of the three mentioned facilities, only "Elena" MHPP has been constructed and operating, while the other two have been dropped as IP, subject to implementation (due to expiry of the legal period of the decision on EIA, which is valid for 5 years /Art . 99, paragraph 8 of the EPA/). In this case, there are no prerequisites for overlapping of the hazards generated during the construction of MHPP with the construction of the NRRAW. The mere operation of the MHPP is not related to considerable pollution of the environment with hazards and does not affect habitats and bird species in PA "Zlatiyata" with gas emissions, wastewater, radioactive release, as well as noise (given that the generators are placed, as required by the standard, in soundproof shield and further encapsulated /according to data from participation in REIA and RADI of similar projects/), etc. In this specific case we have a river-bed MHPP (not pressure), which is related to the formation of a large in area reservoir volume behind its dam. This could be considered a positive impact with regard to birds since such reservoir volumes can subsequently provide food base and other favourable conditions for a number of birds attached to aquatic areas, including waterfowl subject to conservation in PA "Zlatiyata". In this connection, regarding the subject and purpose of the protection of the area, no negative cumulative impact could be expected as a result of the operation of the constructed MHPP with the implementation of the NRRAW and the other PPP/IP at the site of the NPP.



- Construction of a wind farm "Valchedram" in the land of the village of Gorni Tsibar, village of Zlatiya, Razgrad, village of Cherni Vrah, village of Septemvriyski and the town of Valchedram. Since the implementation of the IP has not commenced within a period of 5 years from the date of entry into force of the decision on EIA (Art. 99, para 8 of the EPA), the decision (№ MO2-2/2009 of RIEW- Montana) has lost its legal action, and therefore the investment proposal can be considered terminated and no cumulative impact is expected respectively.

The comparative analysis of the nature of the NRRAW and the characteristics of the above listed investment proposals in the area of PA "Zlatiyata" makes it possible to conclude that, in combination with the assessed investment proposal, they will have no additional adverse impact on the habitats (i.e. land cover classes) and the birds subject to conservation in the protected area.

### ***II.3 Cumulative impact within protected area "Kozloduy Islands" with code BG0000533 declared under Directive 92/43/EC on the conservation of habitats and wild flora and fauna.***

In the area of PA "Kozloduy Islands" with code BG0000533 there are no IP/PPP, with which the implementation of the NRRAW can cumulate.

### ***II.4 Cumulative impact within protected area "Ogosta River" with code BG0000614 declared under Directive 92/43/EC on the conservation of habitats and wild flora and fauna.***

For the area of PA "Ogosta River" with code BG0000614 the expected cumulative impact of the implementation of NRRAW, in combination with the mentioned PPP/IP within the area, has the following features:

- "Construction of a wind farm by installing 55 WEA" in the land of the town of Oriahovo and the land of the village of Selanovtsi, Oriahovo Municipality. According to the RADI of the IP on the area, the terrains that are affected by the farm are mostly lands used for intensive agriculture, mainly for cereals, and to a small extent covers open areas, some of which represent natural habitat 6250\* Pannonian loess steppe grassland communities and habitats of hamster. The artificially forested area within the scope of the NRRAW is not related to such habitats. In view of this, no cumulative impact could be expected, since the implementation of the NRRAW does not affect any open territories in the area with a nature of habitat 6250\* and suitable for habitation by the hamster. Rather, it affects an area occupied by an artificial forest vegetation of introduced species (acacia, honey locust, etc.). In this situation, no increase in the affected area in the region can be expected with respect to the forest and open habitats in the area and outside it, nor any additional impacts on the animal species attached to these two completely different types of habitats. Near the site of the IP there are no such habitats that may be affected indirectly. The simultaneous operation of the wind farm and the NRRAW is not able to generate impacts that can be combined and cumulated with regard to the species subject to conservation in the area.
- "Construction of MHPP at Ogosta River with capacity of 530 Kw" in the land of the village of Hurlets, Kozloduy Municipality and "Construction of Glozhene MHPP at Ogosta River" in the land of the village of Glozhene, Kozloduy Municipality. These two IP have not been implemented and have been dropped as ones subject to implementation because:

- The first one has been dropped because of the expiration of the legal period of 5 years under Art. 93, para. 7 of the EPA of the decision of whether EIA is required (Decision № VR-32-PR/2007 dated 09.07.2007).
- For the second IP the EIA procedure was officially terminated by Decision № VR-5-P/2013 dated 04.11.2013 by RIEW-Vratsa.

Therefore these IP should not be considered with regard to any cumulative impact since they have been discontinued.

The comparative analysis of the nature of the NRRAW and the characteristics of the above-listed investment proposals in the area of PA "Ogosta River" allow us to conclude that, in combination with the assessed investment proposal, they will have no additional adverse impact on the habitats (ie . land cover classes) and birds subject to conservation in the protected area.

## ***II.5 Cumulative impact within protected area "Skat River" with code BG0000508 declared under Directive 92/43/EC on the conservation of habitats and wild flora and fauna.***

For the area of PA "Skat River" with code BG0000508 the expected cumulative impact of the implementation of NRRAW, in combination with the mentioned PPP/IP within the area, has the following features:

- "Construction of a fish farm for breeding sturgeon" in the land of the village of Saraevo and the land of the town of Mizia. According to Decision № VR-09-PR/2010 of RIEW-Vratsa, "The implementation of the IP is not likely to affect, destroy or fragment natural habitats and habitats of species subject to conservation in PA "Skat River". "The implementation of the planned activities is not expected to lead to any adverse impact on the populations of the species subject to conservation in the protected area or to their disturbance". "The IP is not expected to generate emissions or waste in form and amounts that could have a negative impact on the protected area." Therefore, no cumulative impact is expected, as the implementation of the fish farm is not associated with impacts on target habitats and species in the PA and on the area itself, i.e. even in the presence of any potential indirect impacts on the area as a result of the implementation of the NRRAW, they are not subject to cumulation with the adverse impacts from the farm since such impacts are practically absent. Moreover, the two IP treat completely different types of territories (respectively habitats) - the farm will be turned into arable fields, while the NRRAW will be turned into an artificially afforested area with introduced and somewhat invasive species. Therefore no cumulative impact can be expected with regard to the loss of similar-type habitats in the region as a whole.
- "Correction of Skat River in the area of the town of Mizia", in the land of the town of Mizia. The IP was announced in 2007, and there is an issued Decision № VR-29-PR/2007 dated 26.06.2007 not to perform EIA since the activities on the correction of the river in the urban part of the town of Mizia have long been implemented and the potential adverse impacts on the area have long been discontinued. In view of this, it is not possible for the future construction and operation of the NRRAW to be cumulated with the IP with regard to any potential adverse impacts (noise, dust, displacement of species, etc.) in PA "Skat".
- "Building embankment on Skat River" in the land of the village of Krushovitsa, Mizia Municipality. The IP was announced in 2007, and there is an issued Decision № VR-26-PR/2007 dated 08.06.2007 not to perform EIA since the activities on the correction of the embankment have long been implemented and the potential adverse impacts on the area have long been discontinued. In view of this, it is not possible for the future construction

and operation of the NRRAW to be cumulated with the IP with regard to any potential adverse impacts (noise, dust, displacement of species, etc.) in PA "Skat".

The comparative analysis of the nature of the NRRAW and the characteristics of the above-listed investment proposals in the area of PA "Skat River" allow us to conclude that, in combination with the assessed investment proposal, they will have no additional adverse impact on the habitats (i.e. land cover classes) and birds subject to conservation in the protected area.

### **III. DESCRIPTION OF THE ELEMENTS OF THE INVESTMENT PROPOSAL WHICH, ALONE OR IN COMBINATION WITH OTHER PPP/IP, COULD HAVE A SIGNIFICANT IMPACT ON THE PROTECTED AREAS OR THEIR COMPONENTS.**

It should be emphasized that the implementation of the complex of buildings and facilities in the composition of the NRRAW and the relevant service infrastructure is not related to the utilization of parts of protected areas or habitats subject to conservation therein, since the terrain where the complex will be established is located entirely outside the scope of Natura 2000 network and is not bordered by areas which are part of this network. **The industrial site includes the following areas and facilities, whose establishment, construction, operation and closure will have an impact, in one way or another, on the environment:**

1) Facilities in the controlled area, including:

- Cells of the repository first stage - "Platform 1" with built-up area of 7.5 decares;
- Cells of the repository second stage - "Platform 2" with built-up area of 7.5 decares;
- Cells of the repository third stage - "Platform 3" with built-up area of 7.5 decares;
- Collection control reservoir with a capacity of 100 m<sup>3</sup> of the system for control of infiltrated waters of the NRRAW;
- Collection control reservoir with a capacity of 100 m<sup>3</sup> of the deep drainage system;

The first platform for disposal will be built before the commencement of the burial, the second one - in about 20 years, and the third one - after 40 years of operation of the NRRAW;

2) Auxiliary buildings and facilities in the supervised area, including:

- One-storey massive building for access control and a portal for vehicles with a total built-up area of 153.8 m<sup>2</sup>;
- One-storey massive building for the reception and temporary storage of containers of RAW with built-up area of 750 m<sup>2</sup>;
- One-storey massive main service building (E) on an area of 700 m<sup>2</sup>;
- One-storey massive building for physical protection and a control room on an area of 540 m<sup>2</sup>;
- One-storey massive administrative building on an area of 550 m<sup>2</sup>;
- One-storey building of service systems on an area of 550 m<sup>2</sup>;
- One-storey building of conventional (construction, etc.), laboratories (Z), on an area of 230 m<sup>2</sup>;
- Workshops (one-storey building) on an area of 450 m<sup>2</sup>;
- Garages (one-storey building) on an area of 290 m<sup>2</sup>;
- Main corridor - structurally independent building, providing connection and access to people and equipment to all buildings, with a total built-up area of 416 m<sup>2</sup>;
- Tank for stormwater;
- Tank for water for firefighting;
- Tank for diesel fuel;

- 3) Adjoining infrastructure – water supply and sewerage systems on the site, surface and underground drainage systems, system for control of infiltrated water, power supply and road network: main access road, bypass road 1, bypass road 2 and parking for the staff;
- 4) Depot for loess with a volume of about 90,000 m<sup>3</sup>, which will be built up in stages on "Radiana" site, especially during the construction of platforms with the cells;
- 5) Depot for temporary storage of soil materials with a volume of about 68,000 m<sup>3</sup>;

Given the nature of IP, **its main elements**, which alone or in combination with other PPP/IP could have **only a potential indirect/indirect adverse impact** on the closest protected areas of the European ecological network Natura 2000 - PA BG0002009 "Zlatiyata", PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River" and PA BG0000508 "Skat River", are **mostly related to the construction of the repository platforms**. This is so because during this stage there will be significant in depth excavation works, required for the formation of the loess-cement cushion, which is part of the third engineering barrier. In this connection, these construction works can lead mainly to more significant dust emissions in the area of the excavation works and generation of significant amounts of dredging spoil, whose disposal could also generate significant dust emissions (if spraying measures are not applied to restrict them). This may be related to the occurrence of some more tangible impacts on the geological base and hydrogeological conditions in the area.

*During normal operation*, according to the findings and conclusions made in the REIA, no significant impacts on water, soil, air and biodiversity are expected in the area of the repository, and this applies to the period of closure and the period of institutional control. It is necessary to reflect that the title of the IP may create the impression in the public (not familiar in detail of its nature) and among non-specialists that there is a substantial risk of radioactive contamination of the area as a result of the disposal of packages of RAW. It should be emphasized here that **this risk is minimized as early as the stage of "sealing" of low- and intermediate-level radioactive waste in reinforced concrete containers. It is necessary once again to emphasize the type of radioactive waste subject to disposal, namely category 2a** according to the *Ordinance on the Safety of Radioactive Waste Management*. According to the definition of category 2a, the maximum specific activity of the long-lived radionuclides in one package is  $\leq 4.0E+06$  Bq/kg, provided that the maximum average value of the long-lived radionuclides in the disposal cells must not exceed  $4.0E+05$  Bq/kg. **This particular case refers to:**

- Liquid RAW subjected to additional concentration by evaporation and to conditioning by cementing - cubic residue resulting from the purification and concentration of different types of radioactively contaminated water generated during the operation of the power plant, spent ion-exchange resins and sorbents (treatment and packaging is done in a packing workshop located on the site of Kozloduy NPP);
- Solid waste - contaminated clothing and personal protective equipment, contaminated equipment and instruments (including from the decommissioning of the reactors), earth masses, construction waste, laboratory waste from the use of radionuclides for scientific, medical and industrial purposes (compression is done in a packing workshop located on the site of Kozloduy NPP);

**The investment proposal is not related to the treatment and disposal of spent nuclear fuel from the operation of the reactors in Kozloduy NPP or other NPP, as well as other RAW outside the above-mentioned category.**

The NRRAW will be used for burial of processed and conditioned waste in the Workshop for processing RAW (WPRAW). The processing technologies implemented in the WPRAW are as follows: 1/ Cementation of cubic residue (liquid RAW); 2/ Pressing of solid RAW; 3/ Packaging of cement mixture and solid RAW in protective reinforced concrete containers (RCC). **They will be covered sources of gamma ionizing radiation only, since the package will eliminate the spread of alpha and beta particles outside it.** The containers are planned



to be constructed in such a way that the power of the equivalent dose of gamma radiation of one packages of RAW is limited to 2 mSv/h at the surface and a maximum of 0.1 mSv/h at a distance of 1 m from the surface. **According to the law on the weakening of the power of the equivalent gamma dose with the square of the distance, the calculated equivalent dose after a few meters will virtually equal the natural one.** The subsequent disposal of packages in the cells of the repository by means of closing and covering them with a multi-layer engineering barrier (including the built in advance loess-cement cushion under them) will completely neutralize the possibility of radioactive contamination of water, soil, air, geological environment and the elements of biodiversity in the region as a result of the penetration of gamma radiation in them. This will be supported by the service systems of the repository - especially for network for control and discharge of infiltrated water and the network for deep drainage, which have been described in the abstract. It should be borne in mind that, as technology, the process of storing of RAW in the NRRAW is not associated with a probability of release of gas emissions into the air.

Of course, it is necessary to take into account the *probability of occurrence of accidents and incidents in the repository and in some of the buildings* where the containers with waste will be received and processed, and especially of accidents and incidents that may lead to distortions in the integrity of the structure of the facility, which can lead to penetration of the RCC in the environment, where the surfaces of such containers and their contents (in case of distortion in the integrity of the containers) will enter in direct contact with water, soil and air and will contaminate them locally in terms of radiation. Accordingly, on the one hand, there is a risk for part of this pollution to be transferred to the nearest protected areas and habitats in them during the movement of groundwater and surface runoff produced by rainfall. On the other hand, there is a risk to directly affect species subject to conservation, which inhabit the protected areas and the area of the repository, or to indirectly affect them by means of the food chain. In the case, such accidents can be caused mainly by very strong earthquakes.

As regards seismicity, "Radiana" site is located within the stable part of the Moesian platform, which determines the low level of seismic activity in a sub-regional scale. The maximum expected earthquake in the subregion is  $M_{max} = 5.0$ . The main sources of seismic hazard are the seismic zones outside the area of the site. The most important of these is Vranča area in neighbouring Romania, which has generated events with magnitude  $M > 7$ . The local seismic foci have documented earthquakes with  $M < 4$  and fall into the category of background seismicity. According to seismicity maps for periods of 1000 and 10,000 years, the area can be subject to seismic impacts of VII grade of the MSK-64 scale, under which the buildings and facilities are ensured with a seismic coefficient  $K_c = 0.10$ . In this regard, the repository, its service installations (system for infiltrated water, system for deep drainage, servicing tanks, etc.) and the auxiliary buildings, facilities and installations in it will be designed, constructed, sized and secured in accordance with the seismicity and the degree of earthquake strength, typical for the area. The seismic coefficient ( $K_c$ ) and the coefficient of dynamic  $\beta_i$  will be defined in accordance with Art. 152 of Ordinance № RD-02-20-2/2012 on the design of buildings and facilities in seismic areas (SG. 13/2012). In this situation, the risk of occurrence of disorders in the structures of the repository, auxiliary buildings and service installations as a result of occurrence of earthquake impacts ranging from I-st to VII-th degree under the MSK-64 scale for periods of 1000 and 10,000 years will be completely neutralized. In the case, in view of these periods, for the time of the stage of operation, closure and institutional control of the repository - a total of about 400 years, the probability of an earthquake of a higher order (VIII-th grade or higher under the MSK-64 scale) is negligible and virtually absent. Even in the case of occurrence of such an event, the negative effect of the release of the entire quantity of buried low and intermediate- level RAW in the environment would be incommensurably and negligibly small compared to the damage caused by the failed



blocks of Kozloduy NPP, located in proximity, whose earthquake resistance is also graded to the VII-th grade under the MSK-64 scale. After the expiry of the stage of institutional control the site of the repository will be subject to restoration of the land use, and after this period the residual radioactivity of the buried RAW will no longer be able to have dangerous radiation on the living organisms.

The NRRAW is designed as a system of five barriers that will ensure the safe isolation of radioactive waste from the environment for a period of time until the radionuclides in the waste are hazardous to the living organisms. These barriers act consecutively, so that a failure in one or more barriers or their degradation over time is compensated by the retention capacity of the other barriers.

Regarding possible terrorist attacks, there is a ban for aircraft to fly over the area of Kozloduy NPP, and the access to the perimeter of "Radiana" site will be monitored by security police. In addition, there will be an internal department of physical protection. It will perform 24-hour control, supervision and monitoring of the facility and will respond to infringement. Continuous monitoring and supervision of the NRRAW during and after normal work shift will be implemented through alarms and warnings, including: fire alarms, cameras and sensors for physical protection and alarm systems for infringement of the perimeter, alarms for radiation protection. It has been found that the only significant event of technogenic origin, which may occur in the area, is an explosion of a vehicle passing along the internal road of the plant under the site and the section of the national road II-11 Kozloduy-Hurlets-Mizia over the site. Since in the repository there are no any processes of energy-mass-exchange, vessels under pressure, storage of explosives and other flammable materials, explosions in it are excluded.

Flooding of a destructive nature is not possible to occur at the site due to natural or technogenic causes, in view of the climatic and hydrological characteristics of the terrain, its sufficient remoteness and altitude relative to the Danube River, as well as the tilt and displacement. The probability of an occurrence of a tornado is negligible.

In case of an accident with a special transport vehicle (STV) during the transportation of RCC with RAW, taking into account the speed limit for the vehicles on the site (max. 30 km/h), the intensity of the hit impact will not be high, i.e. it is not assumed that deformation of a container with RAW would occur. Even if such an event occurs, the container will immediately be dispatched by another STV to a workshop for defective packages or to "SU RAW Kozloduy" for additional conditioning and repackaging. Moreover, given the low- and intermediate-level radioactive character of RAW, there is only a slight risk for a temporary, short-term and low radiation of the available flora and fauna (mostly insects) near the incident.

On the basis of the analysis made so far it should be concluded that in this case the assessment of the degree of impact on the considered protected areas should comply mostly with the generated hazards during the construction of the buildings and the repository, when the generated pollution loads will be largest and, to a lesser extent, with the operation, closure and institutional control. It should be borne in mind that parts of the areas themselves will not be directly affected. Rather, some indirect impacts could be expected, associated with the transfer of pollutants in the direction of their territories. It is this possibility that should be taken into account when determining the significance of impacts on the habitats and species subject to conservation in PA, taking into account the likelihood of some impacts on individuals of species subject to conservation in the areas, whose residence is not limited to their territory only, but they could also be found in the area of the IP.

The relationship between the elements of the construction, operation, closure and institutional control of the NRRAW, as well as all potentially possible and probable impacts on species and their habitats in the nearest PA are shown in *Table № 3.1*.

*Table № 3.1*

Elements of the Investment Proposal	Possible potential impacts
<p><b>Construction and preparatory works, including initial design of the surface construction areas, excavation works, construction of the first platform and auxiliary buildings and facilities, delivery and installation of the necessary equipment, subsequent construction of the second and third platform during the respective phase.</b> (each disposal platform will be built over a period of about 20 years).</p>	<ul style="list-style-type: none"> <li>- Removal of topsoil and direct destruction of forest areas, which may be temporarily visited during certain periods of time (e.g. for feeding) by some animal species residing in the nearest protected areas (mainly birds, some mammals, etc.);</li> <li>- Direct impact on the fauna as a whole in the area of the construction sites, spots and routes – e.g. mortality of invertebrates during the extraction of overburden, which can be used as a food base by some vertebrates living in the areas;</li> <li>- Air pollution with dust and exhaust gases (affecting plant organisms and plant communities (habitats) or crops in neighbouring and nearby areas (outside the PA) - temporary physiological and biochemical reactions of pollution at organism level);</li> <li>- Disturbance of animals in adjacent territories (outside the PA) due to noise generation and increased human presence;</li> <li>- Change in the landscape characteristics in the region as a whole (not far from some of the protected areas);</li> <li>- Risk of random accumulation of overburden (soil materials) and dredging spoils (loess) outside the designated sites and landfills;</li> <li>- Termination or narrowing of wildlife corridors for the movement of terrestrial animal species between protected areas and other territories outside them;</li> <li>- Risk of negative impact on the hydrogeological and hydrological characteristics of the area - for example, reduction or drainage of nearby located water bodies as a result of the construction of drainages (in this regard, such areas are absent in the nearest part of the closest PA "Zlatiyata").</li> </ul>
<p><b>Backfilling works in forming the landfill for loess and the landfill for soil material (humus).</b></p>	<ul style="list-style-type: none"> <li>- Relatively long-term withdrawal of land currently occupied by forest vegetation, which may be temporarily visited at certain periods (e.g. for feeding) by some animal species residing in the nearest protected areas (mostly birds, some mammals, etc.);</li> <li>- Mortality of passing or migrated animal individuals (e.g. invertebrates, some reptiles and amphibians) during the backfilling works, which can be used as a food base by some vertebrates living in the areas;</li> <li>- Termination or narrowing of wildlife corridors for the movement of terrestrial animal species between protected areas and other territories outside them;</li> <li>- Disturbance of animals in adjacent territories due to increased human presence and noise during the operation of the machinery for backfilling of earth masses and soil materials;</li> <li>- Air dust pollution of neighbouring and nearby territories and habitats as a result of the activity of backfilling, as well as in windy and dry weather, in the form of dust from the surface of the landfills, provided that subsequently they are not planted with grass (affecting plant organisms and plant communities or crops in neighbouring and nearby territories - temporary physiological and biochemical reactions of pollution at organism level);</li> <li>- In the long term, change in species composition, respectively change in phytocenoses in neighbouring and nearby areas due to possible erosion control grassing and afforestation of landfills with aggressive and invasive species, which can subsequently create a risk of quality deterioration and even replacement of some habitats subject to conservation in the closest protected areas;</li> </ul>
<p><b>Management of infiltrated water from the cells of the landfill and of drainage groundwater from the area of the repository during the operation, closure and institutional control.</b></p>	<p>In this case all these potential waste flows - infiltrated water from the cells of the repository and drainage groundwater from its area are subject to capture by the system for control of infiltrated water and by a system for deep drainage and discharge into two separate tanks for each flow respectively. The collected water in the tanks will be controlled by sampling and, depending on the degree of pollution, it will be discharged either in the stormwater basin, by means of which it will be included in the sewerage and treatment plant of Kozloduy NPP, or it</p>

	<p>will be transferred in a cistern for further specialized treatment in a special installation at the site of the NPP if the contamination of the fluids is above the permissible limit. Therefore, no negative impacts are expected on surface water flows as a result of the discharge in them of waste water or on groundwater as a result of its mixing with water contaminated with radiation, generated by the repository.</p> <p>All systems and equipment related to the management of these flows will be designed, sized and constructed in accordance with the seismicity and level of earthquake proneness, typical for the region.</p>
<b>Management of potentially contaminated radioactive waste water from the floors of some rooms in the auxiliary buildings (main service building and building for reception and temporary storage of packages of RAW)</b>	<p>Potentially radioactive wastewater, generated during the operation and closure in some of the premises of the two mentioned buildings, will be collected by a separate system for liquid radioactive waste and will be discharged by gravity through drainage pipes into two storage tanks located in the basement near the main service building. The collected water in the tanks will be controlled by automatic sampling, and depending on the degree of pollution, it will be discharged either in the nearest shaft for stormwater (if it is not contaminated) or it will be transferred to a cistern for further specialized treatment in a special installation at the site of the NPP if the contamination of the fluid is above the permissible limit. Provided that these management measures have been undertaken, no negative impact should be expected on surface water flows as a result of the discharge in them of wastewater, or on groundwater as a result of its mixing with radiation-contaminated water generated by the auxiliary buildings. The very small amount of expected generated liquid radioactive waste will also contribute to this - the maximum expected value is less than 1 m<sup>3</sup> per month. All systems and equipment related to the management of liquid radioactive waste will be designed, sized and constructed in accordance with the seismicity and level of earthquake proneness, typical for the region.</p>
<b>Transport activities related to the transportation of packages of RAW along the main access road from the portal to the building for reception and temporary storage of packages of RAW, and subsequently along bypass road 1 and/or bypass road 2 to the repository.</b>	<ul style="list-style-type: none"> <li>- <i>Mortality of passing or migratory animal individuals (mostly invertebrates, some reptiles and amphibians) as a result of running over and crushing during the passage of special transport vehicles (STV), carrying packages of RAW, which individuals can be used as a food base by some vertebrates living in the areas.</i> In this case, the risk is negligible since the intensity of the traffic will be very low given the output of 3-4 packages of RAW per day (8 hours) in a five-day working week, and the low speed limit for vehicles passing on the roads within "Radiana" – up to 30 km/h;</li> <li>- <i>Fragmentation of wildlife corridors for the movement of terrestrial animal species between protected areas and other areas outside them as a result of the traffic along the internal site roads.</i> The risk is also negligible given the low productivity (such risk exists only during the 8-hour five days working week, and is absent during the rest of the day as well as on Saturday and Sunday);</li> <li>- <i>Disturbance of animals in adjacent areas as a result of increased human presence and noise from the traffic</i> - The risk is very small, since the intensity of the traffic of STV will be very small, there will be traffic only during the daylight hours, 5 days a week and it will move at a low speed, therefore the noise levels will not be high.</li> </ul>
<b>Activities related to the area for parking of the construction equipment, tank for diesel fuel, garages, parking for private vehicles of the staff and other (during the construction, operation and closure)</b>	<ul style="list-style-type: none"> <li>- In case of incidents - contamination of the soil, groundwater and geological environment as a result of spills of fuel and lubricant materials and as a result of the migration of contaminants, deterioration of habitats in nearby areas;</li> <li>- Increased risk of fires;</li> </ul>
<b>Increased anthropogenic pressure (during construction, operation and closure)</b>	<ul style="list-style-type: none"> <li>- Disturbance of animals as a result of accompanying activities and increased human presence in the neighboring territories of the investment area;</li> <li>- Increase of the intensity of the traffic of vehicles in the region, more specifically between the site and the town of Kozloduy, where the majority of service staff will reside;</li> </ul>

	<ul style="list-style-type: none"> <li>- Contamination of adjacent territories and habitats with household waste and deterioration of the quality of habitats in such territories outside the PA;</li> <li>- Increased risk of fire in the adjacent areas (especially in the forest areas) due to carelessness of the staff;</li> </ul>
<b>Biological reclamation</b> <i>(during the period of closure after the construction of the upper part of the third engineering barrier, i.e. the multi-layer coating whose surface is subject to additional technical and biological reclamation)</i>	<ul style="list-style-type: none"> <li>- Risk of carrying out biological reclamation of the decommissioned facility at the stage of closure with untypical for the region invasive and aggressive species;</li> <li>- Risk of changes in the structure and composition of habitats in the surrounding areas as a result of the spread of invasive species, which in time can spread to the nearest protected areas and create preconditions for deterioration of the quality and even replacement of some habitats subject to conservation in these areas;</li> </ul>

The above-mentioned possible potential impacts as a result of the implementation of the projects in the scope of the investment proposal are local in nature and scope. Therefore, they are not expected to directly affect the territories of PA BG0002009 "Zlatiyata", PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River" and PA BG0000508 "Skat River" - at this stage of preliminary planning and evaluation it is possible to expect only some indirect and secondary impacts on the subject and purpose of their protection. The expected impacts at the next stage of planning are summarized below in Table № 3.2.

The other more important IP and projects that should be taken into account in the assessment of the degree of impact as a result of the implementation of this IP on the habitats and species subject to conservation in the nearest protected areas under Natura 2000 are as follows:

✓ **Investment proposal for the decommissioning of units 1÷4 of Kozloduy NPP.**

The investment proposal envisages the decommissioning of units 1-4 of Kozloduy NPP through their final dismantling within the area for safe storage – as of this point in time the reactors are closed, and the spent nuclear fuel (SNF) of all four units is removed from them and is located in the spent fuel storage (SFS).

There is a REIA with RADI prepared for this IP with regard to the closest PA. The reports have obtained a **positive decision № 8-6/2013** of MEW, which states that no significant negative impact is expected on the subject of conservation in the nearest 6 protected areas.

✓ **Project for construction of a facility for treatment and conditioning of radioactive waste with high coefficient of volume reduction (BPF) at Kozloduy NPP.**

The aim of the investment proposal of Kozloduy NPP is to build a "Facility for treatment and conditioning of radioactive waste with high coefficient of volume reduction in Kozloduy NPP" by using plasma burning, whereby achieving a reduction of the volume of low- and intermediate-level radioactive waste (RAW), stored in the designated places in Kozloduy NPP. The burning plasma facility (BPF) will help to ensure sufficient capacity of the existing facilities for storage of radioactive waste in Kozloduy NPP until the construction of the NRRAW.

A separate REIA, supplemented by RADI, has been prepared for this project, with a **positive decision № 2-2/2014** of the Ministry of Environment and Water.

✓ **Investment proposal for "Construction of new nuclear power capacity of the latest generation at the site of Kozloduy NPP".**

The IP envisages the construction of new nuclear power capacity at the site of Kozloduy NPP, which represents a high-technology energy facility for the production of electricity based on nuclear fuel process. The designed technology for production of electricity from nuclear source includes a reactor with light water under pressure (of the type PWR -



Pressurised Water Reactor), with light water being used as the retarding agent and heat-transfer medium. The technological scheme of the new nuclear power capacity is double-circuit. The most significant advantage of the project for new nuclear power capacity compared to the second generation projects is that the project of the capacity to be constructed will include **passive and specific protective equipment**, including a concept for capturing the molten core, which increases significantly the safety of the nuclear power capacity.

✓ **Project: Construction of a repository for dry storage of spent nuclear fuel (RDSSNF) at the site of Kozloduy NPP.**

RDSSNF at the site of Kozloduy NPP will store assemblies of SNF in specially designed for this purpose containers. The design period of operation of the facility is at least 50 years. The fuel assemblies will be sealed in special containers for storage, which will ensure their safety during the storage period. A separate REIA has been prepared for this report with a **positive decision № 14-7/14.12.2006** of the Ministry of Environment and Water.

✓ **Project: Delivery of equipment for treatment of liquid RAW (Danube installation) at the site of Kozloduy NPP.**

The project ensures delivery of equipment for processing of the water from the special laundry, bathrooms and floor drain from Units 1-4 of Kozloduy NPP as well as conditioning of RAW subject to disposal in the NRRAW. Currently, this waste is processed by systems for special water washing (CBO3) of Units 1 to 4 of Kozloduy NPP, which will be stopped after the processing of all liquid operational RAW. **This project is part of the IP for decommissioning of units 1÷4 of Kozloduy NPP**, therefore the potential impacts of its implementation should be taken into account in the REIA and RADI, approved by **decision № 8-6/2013** of MEW, which has already been discussed above when considering this IP.

✓ **Project: Mobile equipment for decontamination and purification of the water from the reactors of Kozloduy NPP.**

The project will ensure delivery of mobile equipment to be used for decontamination of surfaces of the shaft of the reactor, the Spent Fuel Pool (SFP) and racks and other open and closed tanks of water in them, as well as for conditioning of the resulting radioactive waste. According to a letter of the MEW ref. No. 26-00-2555 to Kozloduy NPP, the project could not be related to the investment proposals listed in Appendices 1 and 2 to the Environmental Protection Act and therefore is not subject to mandatory environmental impact assessment, i.e. it is not associated with significant impacts on the environmental components and the nearest PA respectively.

✓ **Project: Facility for extraction and immobilization of spent ion-exchange resins in Kozloduy NPP.**

The project should ensure the delivery of equipment for extraction and processing of spent ion-exchange resins from the existing reservoirs. This will take place in a screened room in accordance with the appropriate standards, and is therefore not associated with impacts on the components of the external environment and the nearest PA respectively. **This project is part of the IP for decommissioning of units 1÷4 of Kozloduy NPP**, therefore the potential impacts of its implementation should be taken into account in the REIA and RADI, approved by **decision № 8-6/2013** of MEW, which has already been discussed above when considering this IP.

✓ **Project: Facility for extraction and processing of the solid phase from the tanks with concentrate from the evaporators in Kozloduy NPP.**



The project should ensure the delivery and installation of equipment for extraction and processing of the solid phase of the cubic residue from the evaporators in the reservoirs, located in CK 1 and CK 2. **This project is part of the IP for decommissioning of units 1÷4 of Kozloduy NPP**, therefore the potential impacts of its implementation should be taken into account in the REIA and RADI, approved by **decision № 8-6/2013** of MEW, which has already been discussed above when considering this IP.

✓ **Project: Measuring equipment for release from control and monitoring of the waste in Kozloduy NPP.**

The project should ensure the delivery of equipment for measurement of gamma activity for the purposes of exemption from regulatory control of dismantled equipment and other materials. Therefore, it is not associated with negative impacts on environmental components.

✓ **Project: Delivery of equipment for control of liquid and gaseous discharges from Kozloduy NPP.**

The aim of this project is to meet the requirements of the European Commission Recommendation 2004/2/EURATOM and of the NRA with regard to the monitoring of discharges from Kozloduy NPP. These requirements will be met by upgrading the system for monitoring of liquid and gaseous emissions. The purpose of this system is to improve and optimize the existing system for monitoring (control) of the liquid and gaseous emissions from units 1 to 4 of Kozloduy NPP. Therefore, the implementation of the project is not associated with negative impacts on environmental components.

✓ **Project: Construction of Workshop for size reduction and decontamination of materials (WSRD) in NPP Kozloduy.**

It is envisaged that the workshop will be used for size reduction and decontamination of dismantled radioactive contaminated materials from Turbine Hall, SC1, SC2 and the reactor compartments. **This project is part of the IP for decommissioning of units 1÷4 of Kozloduy NPP**, therefore the potential impacts of its implementation should be taken into account in the REIA and RADI, approved by **decision № 8-6/2013** of MEW, which has already been discussed above when considering this IP.

✓ **Project: Design and construction of sites for management of materials from the activities of decommissioning of units 1-4 of Kozloduy NPP.**

The storage of solid RAW of Category 1 and radioactive materials (RAM) is envisaged within the framework of this project. RAM will be temporarily stored in containers at that site for a period not exceeding 5 years until the specific activity of the contaminated elements is reduced to the level for exemption from regulatory control. Such a facility is currently operating in Greifswald NPP.

Three sites are examined on the territory of units 1-4 of Kozloduy NPP. Two of the sites are envisaged for temporary storage of radioactive materials (RAM) and solid RAW of category I and one site - for storage of conventional waste.

**This project is part of the IP for decommissioning of units 1÷4 of Kozloduy NPP**, therefore the potential impacts of its implementation should be taken into account in the REIA and RADI, approved by **decision № 8-6/2013** of MEW, which has already been discussed above when considering this IP.

The following *Table № 3.2* provides an assessment of the presented in *Table № 3.1* possible types of potential impacts from the implementation the IP on the subject and purpose of the protected areas, taking into account:

- their scope regarding their location with respect to the protected areas;
- at which stage of implementation of the project they are likely to occur; with respect to the effect - whether the impacts have lasting or temporary effect; regarding the duration of the impacts – whether they are permanent, long-term or temporary, and with regard to the temporary ones - whether they are short-, medium-term, periodical, incidental (it is not assumed that they will arise for sure);
- taking into account at this stage of the planning of the possible impacts in terms of the subject and purpose of the conservation of protected areas, i.e. whether they are likely to affect territories of the PA, habitats and species subject to protection in them;
- other plans, programs and investment intentions in the area of IP (in this case all of them are located on the site of the NPP), whose implementation might lead to a cumulative impact.

*Table № 3.2*

<b>Impact type</b>	<b>Impact scope (within the area, outside the area)</b>	<b>Impact stage Duration Periodicity</b>	<b>Possible impacts with regard to the subject and purpose of conservation of PA</b>	<b>Possible cumulative impacts of other IP/PPP in the area of NRRAW</b>
Direct destruction of habitats as a result of absorption of areas in the building-up at the site of the IP with facilities and buildings and shaping dumps with overburden, construction of the road, water and sewer infrastructure and other service sites in the region.	<b>Entirely outside the protected areas.</b> In this case, the entirely constructed road, water and sewer infrastructure for serving the needs of Kozloduy NPP, which is also completely outside the PA, will be used during the construction and operation.	Construction. The actual impact will be temporary and medium-term as it will occur during the construction, and the effect of it will be permanent and long-term - during the operation, closure and institutional control of the repository, i.e. 300 years.	The impact is beyond the habitats subject to conservation in the protected areas and the habitats in the areas of target species. Since the terrain selected for the NRRAW and the adjacent terrains are occupied by an artificially created forest plantation of acacia and other introduced species, there are no affected areas and habitats from Appendix № 1 of the BDA outside areas.	Not expected since there are no PPP/IP related to the utilization of any undeveloped areas, which are occupied by natural or modified habitats (the existing IP/PPP treat the independent industrial site of the NPP, which is a synanthropic habitat).
Fragmentation of habitats and disruption of wildlife corridors as a result of absorption of areas in the building-up at the site of the IP with facilities and buildings, dumps, construction of the road, water and sewer infrastructure and other service sites in the region.	<b>Entirely outside the protected areas.</b> In this case, the entirely constructed road, water and sewer infrastructure for serving the needs of Kozloduy NPP, which is also completely outside the PA, will be used during the construction and operation.	Construction. Operation. Closure. The impact during the construction will be temporary and medium-term, while that during the operation and closure will be permanent and long-lasting in nature.	The impact is outside the habitats subject to conservation in the protected areas and the habitats in the areas of targeted species. Only an impact of fragmentation is expected with respect to the artificial forest plantation of acacia and other introduced species, where the NRRAW will be implemented - conditions are created for its fragmentation of the eastern and western part. This will not lead to fragmentation of the habitats of species in the protected areas. Between the PA themselves no additional prerequisites are created for fragmentation of habitats since the NRRAW is located in the no-access zone of Kozloduy NPP next to the main industrial site of the plant, which in this case is most important for the fragmentation.	Not expected since there are no PPP/IP related to the utilization of any undeveloped areas, which are occupied by natural or modified habitats (the existing IP/PPP treat the independent industrial site of the NPP, which is a synanthropic habitat).
Negative impact on habitats as a result of contamination by dust and exhaust gases.	<b>Entirely outside the protected areas.</b>	Construction. Closure. The impact will be temporary (during the very dry periods) and medium-term in nature.	The potential impacts are outside the habitats subject to conservation in the protected areas and outside the habitats in the areas of targeted species, as the fugitive dust emissions have a limited impact on the air because they are spread over short distances from the source (10-20 m in still air, depending on the	There is possibility for a weak cumulative impact only on the territory of the main operating site of Kozloduy NPP, which is a synanthropic habitat.

			concentration of particulate matter), they are cold (having the temperature of the surrounding air), with high gravity deposition rate and small release height (generated close to the ground surface). In this case, the nearest part of the area subject to development is located at about 500 m from PA "Zlatiyata". The impacts from the exhaust gases of the used construction machinery are also limited to the area in proximity of the relevant construction and assembly equipment and work site.	
Negative impact on habitats as a result of noise pollution.	<b>Entirely outside the protected areas.</b>	The impact will occur mostly during the construction and closure and will be temporary and medium-term in nature.	The potential impacts are outside the habitats subject to conservation in the protected areas and the habitats in the areas of targeted species, as the noise tends to decrease by $3 \div 7$ dB (a) with the doubling of the distance (including with regard to the highest overlay) and depending on the height of the sources, and the territory of the nearest PA "Zlatiyata" is at a distance of about 0.5 km. Thus, assuming that the machinery on the construction site of the NRRAW is a source of noise with levels of 100 dB(A) (according to the REIA), after taking into account the shield characteristics of the terrain (trees and shrubs, i.e. $K_n = 1$ ) at 100 m the limit load decreases to 46 dB(A), at 200 m - 39 dB(A), at 300 m - 34 dB(A), at 400 m - 31 dB(A) and at 500 m - 28 dB(A), which is below the upper thresholds of noise load, typical of quiet areas outside agglomerations - 45 dB(A)/day and 35dB(A)/ night according to Regulation № 6 / 26.06.2006 on Environmental Noise Indicators.	There is possibility for a weak cumulative impact only on the territory of the main operating site of Kozloduy NPP, which is a synantropic habitat.
Negative impact on habitats as a result of increased human presence and traffic in the area.	<b>Entirely outside the protected areas.</b>	The impact will occur in all stages of the implementation of the IP and will be permanent and long-term in nature.	The potential impacts are outside the habitats subject to conservation in the protected areas and the habitats in the areas of targeted species, as the existing access roads to "Radiana" site will be used for access (the independent road from the town of Kozloduy and the road Hurllets-Kozloduy). The site will be entered and exited through the two checkpoints of the guarded area of Kozloduy NPP, which are used for entry by the entire personnel of the plant. The internal road located at a distance of 0.8 km north of the nearest PA "Zlatiyata" will be used afterwards. Therefore, no impacts are expected on the subject and purpose of conservation of the areas. The impacts in consideration will actually be entirely within the already existing ones of NPP and the two loaded roads.	There is possibility for a weak cumulative impact only on the territory of the main operating site of Kozloduy NPP, which is a synantropic habitat.
Risk of negative impact on habitats due to changes in their hydrogeological and hydrological	<b>Entirely outside the protected areas.</b>	Such impacts may occur mostly during the construction and will have a temporary and short-term nature.	No natural watercourses pass through "Radiana" site or near it, there are no areas with standing water (ponds, lakes, etc.), which could be affected by the construction of the NRRAW and	Not expected due to the absence of negative impacts on the hydrological and hydrogeological conditions during the implementation

parameters.			therefore there is no risk of affecting the hydrological conditions of the region and the PA in consideration, and thus affecting indirectly their subject and purpose of conservation. The implementation of the IP is not related to reaching water-saturated geological strata in the hydrogeological profile of "Radiana" site. Thus, such strata could not be affected by the construction of the NRRAW and therefore there is no risk of affecting the hydrogeological conditions of the region and the PA in consideration, and thus affecting indirectly their subject and purpose of conservation.	of the NRRAW.
Risk of negative impact on habitats due to pollution with different types of waste.	<b>Entirely outside the protected areas.</b>	Construction. Operation. Closure. Occasional, short-term and reversible in nature.	In view of the method of management of the types of waste expected to be generated during the construction, operation and institutional control of the repository, described in section I.5.8 of RADI, there will be no contamination of the IP region with waste and thus there will be no preconditions for secondary/indirect negative impact on the habitats in the nearest protected areas and respectively on the subject and purpose of their conservation. Risk of accidental pollution with waste exists only for the specific site of the IP (i.e. outside the habitats in the PA). In view of the nature of the project and the maintenance activities envisaged in the conceptual design, the pollution is subject to immediate removal by the workforce immediately after its occurrence, and therefore can be defined as reversible and short-term in nature.	There are no preconditions for the occurrence of such impact given the incidental, short-term and reversible nature of this risk.
Risk of negative impact on habitats as a result of increased fire hazard.	<b>Entirely outside the protected areas.</b>	Construction. Operation. Closure. Occasional and short-term in nature.	Fires that might occur could not spread towards the protected areas and damage their subject and purpose of conservation because "Radiana" site is limited to the south by the asphalt road between the village of Hurlets and the town of Kozloduy, to the north – by the industrial complex of Kozloduy NPP, further west is the town of Kozloduy, and further east – the village of Hurlets, all located between the protected areas and the territory of IP. It should also be noted that even some reduction of this risk could be expected, as currently the control in this respect within "Radiana" site is very much reduced compared to the envisaged control after the implementation of the repository, given that currently the access to one part of the site from national road II -11 Kozloduy-Hurlets-Mizia to the south is not seriously hindered. A number of passive and active measures will be implemented at the site for protection against fire (including fire alarms, automatic fire irrigation systems, live security guards and places with easily accessible fire-	There are no preconditions for the occurrence of such impact given the incidental, nature of this risk.

			fighting devices).	
Risk of negative impact on habitats as a result of the occurrence of accidents of non-radiation nature.	<b>Entirely outside the protected areas.</b>	Construction. Operation. Closure. Occasional, short-term and reversible in nature.	Possible contaminants generated in the event of occurrence of accidents of non-radiation nature (e.g. oil spills due to damage of the construction machinery, traffic accidents, etc.) are not able to spread towards the protected areas and damage their subject and purpose of conservation as they have a very limited scope - up to several tens of meters from the place of occurrence of the accident, with the pollutants being subject to timely removal by the workforce (e.g. sorbents will be provided for removal of oil leakages at the main construction and operating sites of the project).	There are no preconditions for the occurrence of such impact given the incidental, short-term and reversible nature of this risk.
Risk of negative impact on habitats as a result of the occurrence of accidents of radiation nature.	<b>Entirely outside the protected areas.</b>	Operation. Temporary, occasional (with very low probability of occurrence), short-term and reversible in nature.	Such type of accidents may occur mainly as a result of accidents with vehicles during the transport of RCC with RAW from the site of Kozloduy NPP along the connecting internal road of the plant and during the placing into the cells of the repository. Given the envisaged precautionary measures concerning these activities, this risk is practically negligible, but even if such events occur, in case of damage of the containers, they are subject to immediate shipment to the workshop for defective packages or SU RAW Kozloduy for repackaging. Moreover, given the low- and intermediate-level nature of the RAW, there is only a slight risk for a temporary, short-term and low radiation within the perimeter in immediate proximity to the accident (up to several tens of meters), which is located at a distance of about 500 m from the nearest area. Therefore, there is no risk of spread of contamination in habitats in the PA or impacts on their subject and purpose of conservation, respectively.	There are no preconditions for the occurrence of such impact given the incidental, short-term and reversible nature of this risk.
Risk of negative impact on habitats as a result of incursion of invasive species in habitats.	<b>Outside the protected areas and their surrounding terrains.</b>	Operation (landscaping), closure (biological reclamation). Long-term and permanent in nature.	The IP is associated with the utilization of the artificial forestry area, which is represented mainly by such invasive species (acacia, honey locust, scholar-tree) that will be removed from the site of the IP during the construction, which can be seen as a positive aspect in respect of that risk. Rye-grass will be used for the landscaping and the same species will be used only in some places but in much smaller quantities than the removed ones. The biological reclamation is envisaged to lay down mostly rye-grass, which is spread everywhere. In this regard, in respect of the risk in consideration, there will be no additional impact on habitats in the protected areas and their subject and purpose of conservation, respectively.	There are no preconditions for the occurrence of such impact.
Risk of negative impact on habitats as	<b>Entirely outside the protected areas.</b>	Construction - temporary and	This potential impact concerns the specific site of the IP, which does not	No such impact, because in the area of the IP there are



a result of loss of food base in the area.		medium-term in nature, the impact is long-term and almost permanent as a result of the construction.	treat the forest areas within the scope of the PA. The main purpose of the areas is to ensure sufficiently large habitats where the species under Appendix № 2 of the BPA are provided with the necessary food base and conditions for breeding and residence. In this case, the site does not refer to these parts of the areas and therefore could not affect their main purposes. Regarding the species subject to conservation in the areas, the potential risks should be estimated at the next stage of assessment, examining the degree of impact on each type of species separately (section V).	no PPP/IP related to the utilization of undeveloped areas that are habitats providing food to species subject to conservation (the existing IP/PPP treat the industrial site of the NPP, where there are no conditions for feeding).
Mortality of individuals.	<b>Entirely outside the protected areas.</b>	Construction - temporary and medium-term in nature. Operation and closure - accidental (the existing risk is associated with the transport activities along the service roads and has a very low probability of occurrence, as the speed of the vehicles will be limited to 30 km/h).	It is possible to occur mainly during the construction only with respect to certain species subject to conservation in the PA, which are related to forest areas, whose areas of habitation include not only the areas but also the terrain with the site. In this case, the probability is small as the nearest forest areas are quite far away. The potential risk should be estimated at the next stage of assessment, examining the degree of impact on each type of species separately (section V). It is also necessary to mention here that the potential impacts on the animal species typical of the area of the IP (including with respect to the species included in Appendix 2 of the BDA) are addressed in the REIA, with this assessment being an integral part thereof.	No such impacts are expected because there are no PPP/IP related to the utilization of any undeveloped areas, occupied by natural habitats (the existing IP/PPP treat the industrial site of the NPP, which is a habitat of synantropic species, which are not related to the subject and purpose of conservation of the PA).

#### IV. DESCRIPTION OF THE PROTECTED AREAS, HABITATS, SPECIES AND THE OBJECTIVES OF THE MANAGEMENT AT THE NATIONAL AND INTERNATIONAL LEVEL AND TAKING THEM INTO ACCOUNT WHEN PREPARING THE INVESTMENT PROPOSAL.

The site of the IP is located in immediate proximity to Kozloduy NPP between two roads; one going north and controlled by the NPP as an inner service road of the plant and the other which represents a section of the state road II -11 Kozloduy-Harlets-Mizia to the south. The site measures about 46 ha and is almost rectangular as shown on **Error! Reference source not found.** It belongs to the 2-km preventive protection measures zone PPMZ of Kozloduy NPP.

In this case the territory within which the IP will be implemented along with the adjacent structures does not belong to any protected areas from the Natura 2000 network and does not border any such areas. The protected areas in the Republic of Bulgaria closest to the site of the NRAWR are presented on **Figure No I-3** at the beginning of the report and are situated as follows:

- **Protected area "Zlatiyata" with code BG0002009 established under Directive 2009/147/EC on the conservation of wild birds.** The area is located 0.45 km to the south

and west from the NRAWR site. It was established with Decision of the CM No 122 from 02.03.2007 (SG issue 21/09.03.2007) and approved with Ordinance No ПД-548/05.09.2008 of the MoEW.

- **Protected area "Kozloduy Islands" with code BG0000533 established under Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.** The area is located 3.8 km to the north of the NRAWR site. It was established with Decision of the CM No 122 from 02.03.2007 (SG issue 21/09.03.2007).
- **Protected area "Ogosta River" with code BG0000614 established under Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.** The area is located 6 km to the east from the NRAWR site. It was established with Decision of the CM No 122 from 02.03.2007 (SG issue 21/09.03.2007.).
- **Protected area „Skat River“ with code BG0000508 established under Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.** The area is located 6.3 km to the east from the NRAWR site. It was established with Decision of the CM No 122 from 02.03.2007 (SG issue 21/09.03.2007).

#### **IV.1 Protected area BG0002009 „Zlatiyata” under Directive 2009/147/EC**

- **Identification and location of the area.**

**Protected area BG 0002009 “Zlatiyata”** has been established under Directive 79/409 EEC on the conservation of wild birds, later replaced by Directive 2009/147/EC. The protected area has been approved with Decision of the CM No 122 from 02.03.2007 (SG issue 21/09.03.2007) and established with Ordinance No ПД-548/05.09.2008 of the MoEW. **It spans on an area of 43498.7 ha.**

The protected area “Zlatiyata” occupies a large portion of the plane plateau of the same name. It is located in North-western Bulgaria, in the Danube Valley between the Danube River and the town of Kozloduy to the North, the road connecting the town of Vulchedrum and Hayredin to the South and the riverbeds of the rivers Tsibritsa and Ogosta to the West and East. It is located on a plateau-like level land covered with open steppe type grass areas and arable areas. At some places there are earth loess walls and low trees and bushes, mainly of Common Hawthorn (*Crataegus monogyna*), dog rose (*Rosa canina*) etc. On the earth walls and around them there is plenty of Ailanthus (*Ailantis altissima*). On the territory of Zlatiyata are located the Shishmanov Val Dam (Asparuhov Val), the micro-dams of Bazovets and Hayredin and several smaller water basins (Michev & Stoyneva, 2007). Also, there are scattered pastures, orchards, vineyards, field protection areas and small deciduous forests, as well as river-side forests alongside the Ogosta River.

A map of the protected area is presented in *Appendix No 7.1* to the report.

- **Environmental features and description of the protected area.**

Pursuant to the establishment ordinance of the protected area (SG issue 83/2008) the bird species subject to protection in it are 51 in total. Their distribution is as follows:

- 33 species under item 2.1 of the ordinance of the MoEW: Eurasian Bittern (*Botaurus stellaris*), Little Bittern (*Ixobrychus minutus*), Little Egret (*Egretta garzetta*), Purple heron (*Ardea purpurea*), White stork (*Ciconia ciconia*), Honey Buzzard (*Pernis apivorus*), Black Kite (*Milvus migrans*), Short-toed Eagle (*Circus gallicus*), Marsh Harrier (*Circus aeruginosus*), Hen Harrier (*Circus cyaneus*), Pallid Harrier (*Circus macrourus*), Montagu's Harrier (*Circus pygargus*), Levant sparrowhawk (*Accipiter brevipes*), Long-legged Buzzard (*Buteo rufinus*), Lesser Spotted Eagle (*Aquila pomarina*), Red-footed Falcon (*Falco vespertinus*), Peregrine Falcon (*Falco peregrinus*), Merlin (*Falco columbarius*), Common Crane (*Grus grus*), Great Bustards (*Otis tarda*), European Nightjar (*Caprimulgus europaeus*), Common Kingfisher (*Alcedo atthis*), European Roller (*Coracias garrulus*), Grey-headed Woodpecker (*Picus canus*), Syrian Woodpecker (*Dendrocopos syriacus*), Calandra Lark (*Melanocorypha calandra*), Greater short-toed Lark (*Calandrella brachydactyla*), Woodlark (*Lullula arborea*), Tawny Pipit (*Anthus campestris*), Barred Warbler (*Sylvia nisoria*), Red-backed Shrike (*Lanius collurio*), Lesser Grey Shrike (*Lanius minor*), Ortolan Bunting (*Emberiza hortulana*).
- 18 species under item 2.2 of the ordinance of the MoEW: Little grebe (*Tachybaptus ruficollis*), Great crested grebe (*Podiceps cristatus*), Black-necked grebe (*Podiceps nigricollis*), Great cormorant (*Phalacrocorax carbo*), Grey heron (*Ardea cinerea*), Mallard (*Anas platyrhynchos*), Garganey (*Anas querquedula*), Eurasian sparrowhawk (*Accipiter nisus*), Common buzzard (*Buteo buteo*), Common kestrel (*Falco tinnunculus*), Hobby (*Falco subbuteo*), Water rail (*Rallus aquaticus*), Common moorhen (*Gallinula chloropus*), Eurasian coot (*Fulica atra*), Little ringed plover (*Charadrius dubius*), Northern lapwing (*Vanellus vanellus*), European bee-eater (*Merops apiaster*), Sand martin (*Riparia riparia*).

Table No 4.1.1 below shows information about the habitat class distribution in the protected area as well as the percentage and size distribution.

Table No 4.1.1

<b>Habitat Class</b>	<b>% Coverage</b>	<b>Area dca</b>
Water inland areas (standing water, running water)	1	4350
Other arable land	0	0
Other land (including towns, villages, roads, waste places, mines, industrial sites)	3	13050
Extensive grain crops (including rotation crops periodically let lie fallow)	90	391489
Non-forest areas cultivated with wood vegetation (incl. fruit trees, vineyard, roadside trees)	1	4350
Rocks within the inland, taluses, sands, permanent snow and glaciers	0	0
Dry grass communities, steppes	4	17399
Shrub communities	0	0
Broad- leaved deciduous woodland	1	4350
<b>Total habitat coverage</b>	<b>100</b>	<b>434987</b>

• **Conservation objectives and subjects.**

*The conservation objectives within the protected area are as follows:*

- **Preserving the area** of the natural habitats and species and populations habitats subject to conservation **within the protected area.**
- **Preserving the natural state of the natural habitats and habitats of species subject to conservation within the protected area**, including the natural species composition for these habitats, the specific species and environmental conditions.
- **Restoring if necessary the area and natural state of priority natural habitats and species habitats**, as well as species populations subject to conservation **within the protected area.**

*The following bird species are subject to conservation and are included in Annex 2 to the Biodiversity Act (Annex I to Directive 2009/147/EC):*

Table No 4.1.2

<b>BIRDS included in Annex I to Directive 79/409/EEC</b>										
<b>COD E</b>	<b>NAME (English)</b>	<b>NAME (Latin)</b>	<b>Resident</b>	<b>Migratory population</b>			<b>Assessment</b>			
				<b>Breeding</b>	<b>Wintering</b>	<b>Passing</b>	<b>Pop.</b>	<b>Con.</b>	<b>Iso.</b>	<b>Glo.</b>
A042	Lesser White-fronted Goose	<i>Anser erythropus</i>			1i	1i	B	A	C	B
A022	Little Bittern	<i>Ixobrychus minutus</i>		10p/7-13p			C	B	C	C
A403	Long-legged Buzzard	<i>Buteo rufinus</i>	6p				C	A	C	B
A031	White Stork	<i>Ciconia ciconia</i>		66p			C	A	C	A
A097	Red-footed Falcon	<i>Falco tinnunculus</i>		20p/2-38p			A	B	C	A
A021	Bittern	<i>Botaurus stellaris</i>	2p/1-3p				B	B	C	B
A246	Woodlark	<i>Lullula arborea</i>	5p				D			
A379	Ortolan Bunting	<i>Emberiza hortulana</i>		950p		10i	C	A	C	A
A242	Calandra Lark	<i>Melanocorypha calandra</i>	5p				C	B	C	C
A129	Great Bustard	<i>Otis tarda</i>			5i		A	B	B	A
A229	Kingfisher	<i>Alcedo atthis</i>	6p				C	B	C	C
A224	Nightjar	<i>Caprimulgus europaeus</i>		9p/2-16p			C	B	C	C
A402	Levant Sparrowhawk	<i>Accipiter brevipes</i>		5p/4-6p			A	B	C	A
A243	Short-toed Lark	<i>Calandrella brachydactyla</i>		59p/11-108p			B	A	C	A
A084	Montagu's Harrier	<i>Circus pygargus</i>		12p			B	A	C	A
A511	Saker	<i>Falco cherrug</i>		0-1i		P	C	B	B	B
A026	Little Egret	<i>Egretta garzetta</i>		18p			C	B	C	B
A089	Lesser Spotted Eagle	<i>Aquila pomarina</i>		3p			C	B	C	C
A098	Merlin	<i>Falco columbarius</i>			4i/3-5i	1i	D			
A080	Short-toed Eagle	<i>Circaetus gallicus</i>		4p			C	A	C	C
A072	Honey Buzzard	<i>Pernis apivorus</i>		2p			C	B	C	C
A255	Anthus campestris	<i>Anthus campestris</i>		84p/38-130p			B	A	C	A
A082	Hen Harrier	<i>Circus cyaneus</i>			7i/5-10i	15i	D			

A029	Purple Heron	<i>Ardea purpurea</i>		5p			B	B	C	A
A127	Crane	<i>Grus grus</i>				10i	C	A	C	C
A234	Grey-headed Woodpecker	<i>Picus canus</i>	14p				C	A	C	B
A231	Roller	<i>Coracias garrulus</i>		77p/14-130p		1i	B	A	C	A
A429	Syrian Woodpecker	<i>Dendrocopos syriacus</i>	682p/134-1230p				B	A	C	A
A103	Peregrine	<i>Falco peregrinus</i>		1p			C	A	C	C
A083	Pallid Harrier	<i>Circus macrourus</i>				4i/3-5i	D			
A081	Marsh Harrier	<i>Circus aeruginosus</i>	8p		2i/1-3i	10i	B	A	C	A
A338	Red-backed Shrike	<i>Lanius collurio</i>		1600p		10i	C	A	C	B
A073	Black Kite	<i>Milvus migrans</i>		1p			C	B	C	C
A339	Lesser Grey Shrike	<i>Lanius minor</i>		100p/95-100p		1i	B	A	C	A
A307	Barred Warbler	<i>Sylvia nisoria</i>		59p/11-108p		10i	B		C	B

### • Vulnerability

“Zlatiyata” is the biggest compact non-inhabited plain territory in Bulgaria. It is affected by human activities that have to do primarily with agriculture, forestry and infrastructure development. The intensification of agriculture, the use of pesticides and artificial fertilizers, the removal of hedges and shrubs are the activities with the most serious negative impact on the quality of the habitats.

The cutting down of riverside forests and trees in the field protection belts results in a rapid and steep decline of the population of the Red-footed Falcon (*Falco vespertinus*) due to the disappearance of its nesting places. The construction of wind energy farms is a potential threat both for the habitats and for the birds in the region.

### • Impacts and activities in and near the protected area.

The following impacts and activities have been registered in the protected area:

*Table No 4.1.3*

Code	Name	Int.	Imp.	%	Area dca
A01	Cultivation	A	-	80	347990
A03	Mowing/ cutting of grassland	A	-	30	130496
A07	Biocide, hormone and pesticide use	A	-	80	347990
A08	Fertilization	A	-	80	347990
A09	Irrigation	A	0	80	347990
A04	Grazing	B	0	20	86997
A10	Reorganization of agricultural lands	B	0	5	21749
A10.01	Removing hedges and shrubs	B	-	5	21749
B2.01	Re-forestation	C	-	10	43499
B2.02	Forestry clearance	A	0	10	43499
B2.04	Clearing dead and decaying trees	A	0	100	434987
A05.01	Animal breeding	B	0	10	43499
A05.02	Cattle feeding	B	0	10	43499
F02.03	Sport fishing	C	0	5	21749
F3.01	Hunting	A	-	100	434987



*Contracting Authority: State Enterprise “Radioactive Waste”*

F03.02.03	Trapping, poisoning, pouching	A	-	100	434987
E03	Waste disposal	A	-	5	21749
E03.01	Domestic waste disposal	A	-	5	21749
D01.01	Paths, routes, bicycle routes	C	0	4	17399
D01.02	Roads, vehicle roads	A	-	5	21749
D04.02	Airports, helicopter landing sites	A	-	1	4350
D02.01	Overhead power lines	A	-	1	4350
D02.09	Other energy transportation facilities	B	-	95	413238
G02.08	Camping and caravans	C	-	1	4350
G01.03	Motor vehicles	A	-	1	4350
H01	Water pollution	C	0	10	43499
H04	Air pollution	C	0	5	21749
H04.03	Soil pollution	C	0	8	34799
J02.11	Changes related to the level of accumulation, disposal and deposition of scraped alluvium	C	0	10	43499
K01.03	Drying out	C	0	10	43499
L08	Floods	C	0	60	260992
E03.02	Industrial waste disposal	A	-	5	21749
E04.01	Agricultural facilities	B	-	3	13050
E05	Material storage	A	-	3	13050

The following impacts and activities have been registered outside the protected area:

*Table No 4.1.4*

Code	Name	Int.	Imp.
A01	Cultivation	A	0
A03	Mowing/ Felling	B	0
A07	Biocide, hormone and pesticide use	A	0
A08	Fertilisation	A	0
A09	Irrigation	A	0
A04	Grazing	B	0
A10	Reorganization of agricultural lands	B	0
A10.01	Removing hedges and shrubs	B	0
B02.01	Re-forestation	C	0
B02.02	Forestry clearance	A	0
B02.04	Clearing dead and decaying trees	A	0
A05.01	Animal breeding	B	0
A05.02	Cattle feeding	B	0
F02.03	Sport fishing	C	0
F3.01	Hunting	C	0
F03.02.03	Trapping, poisoning, pouching	C	0
E03	Waste disposal	C	0
E03.01	Domestic waste disposal	C	0
D01.01	Paths, routes, bicycle routes	C	0
D01.02	Roads, vehicle roads	B	0
D04.02	Airports, helicopter landing sites	B	0
D02.01	Overhead power lines	C	0
H01	Water pollution	C	0
H04	Air pollution	C	0

H04.03	Soil pollution	C	0
E03.02	Industrial waste disposal	C	0
E04.01	Agricultural facilities	C	0
E05	Material storage	C	0

#### **IV.2 Protected area BG0000533 “Kozloduy Islands” under Directive 92/43/EEC**

##### **• Identification and location of the area**

**Protected area BG0000533 “Kozloduy Islands”** has been established under Directive 92/43/EEC on the protection of natural habitats and of wild flora and fauna with Decision of the Council of Ministers No 122 of 2.03.2007 and Commission Decision from 12.12. 2008. The area is located on islands in the Danube River, north of the town of Kozloduy and Kozloduy NPP and has **total area of 9090.35 dca**.

A map of the protected area is presented in *Appendix No 7.2* to the report.

##### **• General features**

The area includes three larger islands. About 70% of “Kozloduy Islands” are covered with forest plantations. The western part of Svraka island is covered with sandy deposits.

The site is of medium to high conservation value.

*Table No 4.2.1* below shows information about the habitat class distribution in the protected area as well as the percentage and size distribution.

*Table No 4.2.1*

<i><b>Habitat Class</b></i>	<i><b>% Coverage</b></i>	<i><b>Area dca</b></i>
Inland water bodies (Standing water, Running water)	57	5181
Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	1	91
Artificial forest monoculture (e.g. Plantations of poplar or Exotic trees)	20	1818
Coastal sand dunes, Sand beaches, Machair	6	545
Bogs, Marshes, Water fringed vegetation, Fens	3	273
Heath, Scrub, Maquis and Garrigue, Phygrana	8	727
Broad-leaved deciduous woodland	5	455
<b>Total habitat cover</b>	<b>100</b>	<b>9090</b>

##### **• Conservation objectives and subjects.**

*The conservation objectives within the protected area are as follows:*

- **Preserving the area** of the natural habitats and species and populations habitats subject to conservation **within the protected area**.
- **Preserving the natural state of the natural habitats and habitats of species subject to**

conservation within the protected area, including the natural species composition for these habitats, the specific species and environmental conditions.

- Restoring if necessary the area and natural state of priority natural habitats and species habitats, as well as species populations subject to conservation within the protected area.

*The following habitat types included in Annex I to Directive 92/43/EEC and species included in Annex II of the same Directive are subject to conservation:*

Table No 4.2.2

<b>HABITAT TYPES</b> from Annex I to Directive 92/43/EEC							
CODE	Pr.	NAME	% cover	Pres.	Rel. surf.	Cons. Status	Global assessm.
3270		Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidention</i> p.p. vegetation	2	B	C	B	B
3130		Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>	4	B	C	A	A
91F0		Riparian mixed forests of <i>Quercus robur</i> , <i>Ulmus laevis</i> and <i>Ulmus minor</i> , <i>Fraxinus excelsior</i> or <i>Fraxinus angustifolia</i> , along the great rivers ( <i>Ulmenion minoris</i> )	0.0622	D			
91E0	*	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> )	14.2	B	C	B	B
<b>Note:</b> the above stated habitats subject to conservation in the protected area as well as their percentage coverage in the territory of the protected area are pursuant to the latest available standard Natura 2000 Data form of PA BG0000533 from November 2010, and were updated later on during the inventory revision of the area habitats under the project “Mapping and determining the nature conservation condition of habitats and species – stage I” under OPE 2007 – 2013 and the updated data is presented in the description of the expected impacts on each habitat in section V.2.1 of this report.							

Table No 4.2.3

<b>MAMMALS</b> included in Annex II to Directive 92/43/EEC										
COD E	NAME (English)	NAME (Latin)	Resident	Migratory population			Assessment			
				Bree ding	Winterin g	Passing	Pop.	Con.	Iso.	Glo.
1355	European Otter	<i>Lutra lutra</i>	3-4i				C	A	C	A
2609	Romanian Hamster	<i>Mesocricetus newtoni</i>	P				D			

Table No 4.2.4

<b>AMPHIBIANS AND REPTILES</b> , included in Annex II to Directive 92/43/EEC										
COD E	NAME (English)	NAME (Latin)	Resident	Migratory population			Assessment			
				Bree ding	Winterin g	Passing	Pop.	Con.	Iso.	Glo.
1188	Fire-bellied toad	<i>Bombina bombina</i>	P				D			
1220	European pond terrapin	<i>Emys orbicularis</i>	P				C	A	C	B

1993	Danube crested newt	<i>Triturus dobrogicus</i>	P				D			
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Table No 4.2.5

<b>FISH, included in Annex II to Directive 92/43/EEC</b>										
<b>COD E</b>	<b>NAME (English)</b>	<b>NAME (Latin)</b>	<b>Resident</b>	<b>Migratory population</b>			<b>Assessment</b>			
				Breeding	Wintering	Passing	Pop.	Con.	Iso.	Glo.
4125	Black sea shad	<i>Alosa immaculata</i>	C				C	B	C	B
1130	Aral asp	<i>Aspius aspius</i>	C				B	A	C	A
2533	Balkan Loach	<i>Cobitis elongata</i>	C				B	A	C	A
1149	Spined loach	<i>Cobitis taenia</i>	R				C	A	C	A
2484	Ukrainian brook lamprey	<i>Eudontomyzon mariae</i>	V				C	A	A	A
1124	White-finned gudgeon	<i>Gobio albipinnatus</i>	C				C	A	C	A
2555	Balon's Ruffe	<i>Gymnocephalus baloni</i>	C				B	A	C	A
1157	Striped Ruffe	<i>Gymnocephalus schraetzer</i>	C				B	A	C	A
1145	Mud loach	<i>Misgurnus fossilis</i>	C				B	A	C	A
2522	Knife	<i>Pelecus cultratus</i>	R				C	A	C	A
1134	European bitterling	<i>Rhodeus sericeus amarus</i>	C				C	A	C	A
1146	Goldside Loach	<i>Sabanejewia aurata</i>	P				D			
1160	Streber	<i>Zingel streber</i>	R				B	A	C	A
1159	Zingel	<i>Zingel zingel</i>	C				B	A	C	A

Table No 4.2.6

<b>INVERTEBRATES, included in Annex II to Directive 92/43/EEC</b>										
<b>COD E</b>	<b>NAME (English)</b>	<b>NAME (Latin)</b>	<b>Resident</b>	<b>Migratory population</b>			<b>Assessment</b>			
				Breeding	Wintering	Passing	Pop.	Con.	Iso.	Glo.
1032	Thick shelled river mussel	<i>Unio crassus</i>	R				C	B	C	B
1083	Stag Beetle	<i>Lucanus cervus</i>	R				D			

- **Vulnerability.**

The Northern part of the Svraka Island and the Cape of the Kozloduy Island are fairly not influenced by human impact. The Southern part of the Svraka Island and the tail of Kozloduy Island are threatened by the penetration of introduced tree and shrub species. In the protected area are preserved natural forests of White Willow (*Salix alba*), Field Elm (*Ulmus minor*) and black poplar (*Populus nigra*).

- **Impacts and activities in and near the protected area.**

The following impacts and activities have been registered in the protected area:

*Table No 4.2.7*

Code	Name	Int.	Imp.	%	Area dca
B2.02	Forestry clearance	A	-	30	2727,11
F02.01.02	Floating net fishing	B	-	30	2727,11
F03.01	Hunting	C	0	100	9090,35
K01.01	Erosion	B	-	10	909,04
I01	Specific species invasion	A	-	50	4545,18
D01.02	Roads, vehicle roads	C	0	1	90,90
B01.02	Artificial afforestation	A	-	20	1818,07
F06	Activities related to hunting, fishing and gathering	B	-	50	4545,18

The following impacts and activities have been registered outside the protected area:

*Table No 4.2.8.*

Code	Name	Int.	Imp.
B01.02	Artificial afforestation	A	-
B2.02	Forestry clearance	A	-
F02.01.02	Floating net fishing	B	0
F03.01	Hunting	B	0
K01.01	Erosion	B	-
I01	Invasion of certain species	A	-

• **Prohibition mode.**

*Table No 4.2.9*

Conservation modes	Habitat code
Prohibition on all types of cutting.	91 E0
Prohibition on activities related to changing the hydrological status.	91 E0
Prohibition on changing the land purpose except when it benefits the public health and safety or due to other reasons of primary public interest including such resulting in exceptionally beneficial impacts to the environment.	91 E0

**IV.3 Protected area BG0000614 „Ogosta River” under Directive 92/43/EEC**

• **Identification and location of the area.**

**Protected area BG0000614 “Ogosta River”** has been established under Directive 92/43/EEC on the protection of natural habitats and of wild flora and fauna with Decision of the Council of Ministers No 122 of 2.03.2007 and Commission Decision from 12.12. 2008. Protected area under the Habitats Directive overlapping a protected area under the Birds Directive. **The area is located on a total of 13657.38 dca.**

A map of the protected area is presented in *Appendix No 7.3* to the report.

• **General features.**



The protected area includes the course and the banks of the Ogosta River. The banks of the Ogosta River are reinforced, the bottom is covered with a lot of sediments and the water is eutrophic, which is a consequence of the impact of the dam near the town of Montana. The accumulation of sediments and the eutrophic water are the reason for the formation of habitats 3260 and 3270, which are of Community importance. Near the village of Kriva Bara, there are the remnants of an old riverbed which is 5 km long and which has turned into a eutrophic lake with macrophytes. The Protected Territory "Daneva Mogila" established by Order 413 of 10.05.1982 is located on the right bank of the Ogosta River. This is a place of spectacular scenery and with a group of old trees of *Quercus robur*. The Blatoto Area [Swamp Area] (3150) is located near the mouth of the Ogosta River. The last 4-5 km of the river course are overgrown by aquatic vegetation (3260) and are rich in fish. On the slopes of the marshland to the west of the town of Oryahovo, there is Pannonic loess steppe vegetation\* (3260) with diverse flora and fauna.

Table No 4.3.1 below shows information about the habitat class distribution in the protected area as well as the percentage and size distribution.

Table No 4.3.1

<i>Habitat Class</i>	<i>% Coverage</i>	<i>Area dca</i>
Inland water bodies (Standing water, Running water)	12	1638,89
Extensive grain crops (including rotation crops periodically let lie fallow)	18	2458,33
Artificial forest monoculture (e.g. Plantations of poplar or Exotic trees)	9	1229,16
Improved pastures (artificially created from grass mixtures)	51	6965,26
Dry grass communities, steppe	2	273,15
Bogs, Marshes, Water fringed vegetation, Fens	6	819,44
Broad-leaved deciduous forests	2	273,15
<b>Total habitat cover</b>	<b>100</b>	<b>13657,38</b>

• **Conservation objectives and subjects.**

The conservation objectives within the protected area are as follows:

- **Preserving the area** of the natural habitats and species and populations habitats subject to conservation **within the protected area.**
- **Preserving the natural state of the natural habitats and habitats of species subject to conservation within the protected area**, including the natural species composition for these habitats, the specific species and environmental conditions.
- **Restoring if necessary the area and natural state of priority natural habitats and species habitats**, as well as species populations subject to conservation **within the protected area.**

The following habitat types included in Annex I to Directive 92/43/EEC and species included in Annex II of the same Directive are subject to conservation:

Table No 4.3.2

<b>HABITAT TYPES listed in Annex I to Directive 92/43/EEC</b>							
CODE	Pr.	NAME	% cover	Pres.	Rel. surf.	Cons. Status	Global assessm.
3270		Rivers with muddy banks with Chenopodium rubri p.p. and Bidention p.p. vegetation	0.18	A	C	A	A
3260		Water courses of plain to montane levels with the Ranunculon fluitantis and Callitricho-Batrachion vegetation	0.18	A	C	A	A
6250	*	Pannonic loess steppic grasslands	8.77	A	C	A	A
91Z0		Moesian silver lime woods	0.5	D			
3150		Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	6.79	A	C	A	A
91E0	*	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	0.213	A	C	A	A
<b>Note:</b> the above stated habitats subject to conservation in the protected area as well as their percentage coverage in the territory of the protected area are pursuant to the latest available standard Natura 2000 Data form of PA BG0000614 from November 2010, and were updated later on during the inventory revision of the area habitats under the project "Mapping and determining the nature conservation condition of habitats and species – stage I" under OPE 2007 – 2013 and the updated data is presented in the description of the expected impacts on each habitat in section V.2.1 of this report.							

Table No 4.3.3

<b>MAMMALS, included in Annex II to Directive 92/43/EEC</b>										
COD E	NAME (English)	NAME (Latin)	Resident	Migratory population			Assessment			
				Bree ding	Winterin g	Passing	Pop.	Con.	Iso.	Glo.
1355	European Otter	<i>Lutra lutra</i>	2-3i				C	A	C	A
2609	Romanian Hamster	<i>Mesocricetus newtoni</i>	V				C	B	C	C
1335	European souslik	<i>Spermophilus citellus</i>	R				C	B	C	A

Table No 4.3.4

<b>AMPHIBIANS AND REPTILES, included in Annex II to Directive 92/43/EEC</b>										
COD E	NAME (English)	NAME (Latin)	Resident	Migratory population			Assessment			
				Bree ding	Winterin g	Passing	Pop.	Con.	Iso.	Glo.
1188	Fire-bellied toad	<i>Bombina bombina</i>	P				C	A	B	A
1171	Southern crested newt	<i>Triturus karelinii</i>	P				D			
1193	Yellow-bellied toad	<i>Bombina variegata</i>	P				C	A	B	A
1279	Four-lined snake	<i>Elaphe quatuorlineata</i>	P				C	A	C	B
1220	European pond terrapin	<i>Emys orbicularis</i>	C				C	A	C	A

1217	Hermann's tortoise	<i>Testudo hermanni</i>	P				D			
1993	Danube crested newt	<i>Triturus dobrogicus</i>	P				C	A	B	A

Table No 4.3.5

<b>FISH, included in Annex II to Directive 92/43/EEC</b>										
<b>COD E</b>	<b>NAME (English)</b>	<b>NAME (Latin)</b>	<b>Resident</b>	<b>Migratory population</b>			<b>Assessment</b>			
				Breeding	Wintering	Passing	Pop.	Con.	Iso.	Glo.
4125	Black sea shad	<i>Alosa immaculata</i>	R				D			
1130	Aral asp	<i>Aspius aspius</i>	C				B	A	C	A
1138	Mediterranean barbel	<i>Barbus meridionalis</i>	C				C	B	C	B
2533	Balkan Loach	<i>Cobitis elongata</i>	C				B	A	C	A
1149	Spined loach	<i>Cobitis taenia</i>	C				B	A	C	A
2484	Ukrainian brook lamprey	<i>Eudontomyzon mariae</i>	V				D			
1124	White-finned gudgeon	<i>Gobio albipinnatus</i>	C				C	A	C	A
2555	Balon's Ruffe	<i>Gymnocephalus baloni</i>	C				B	A	C	A
1157	Striped Ruffe	<i>Gymnocephalus schraetzer</i>	C				B	A	C	A
1145	Mud loach	<i>Misgurnus fossilis</i>	C				B	A	C	A
2522	Knife	<i>Pelecus cultratus</i>	R				C	B	C	B
1134	European bitterling	<i>Rhodeus sericeus amarus</i>	C				C	A	C	A
1146	Goldside Loach	<i>Sabanejewia aurata</i>	P				D			
1160	Streber	<i>Zingel streber</i>	R				B	A	C	A
1159	Zingel	<i>Zingel zingel</i>	C				B	A	C	A

Table No 4.3.6

<b>INVERTEBRATES, included in Annex II to Directive 92/43/EEC</b>										
<b>COD E</b>	<b>NAME (English)</b>	<b>NAME (Latin)</b>	<b>Resident</b>	<b>Migratory population</b>			<b>Assessment</b>			
				Breeding	Wintering	Passing	Pop.	Con.	Iso.	Glo.
1032	Thick shelled river mussel	<i>Unio crassus</i>	R				C	B	C	B
4011	Bolbelasmus unicornis	<i>Bolbelasmus unicornis</i>	V				C	B	B	B
1083	Stag Beetle	<i>Lucanus cervus</i>	R				D			
1089	Morimus funereus	<i>Morimus funereus</i>	R				D			
1087	Rosalia longicorn	<i>Rosalia alpina</i>	R				D			

**PLANTS**, included in Annex II to Directive 92/43/EEC – **NONE**.

• **Vulnerability.**

Water pollution and poaching, water power plants, cutting and clearing of riparian forests, changes in the hydrological condition, scraping off the gravel deposits from the riverbed, negative accumulations in the old riverbeds.

• **Impacts and activities in and near the protected area.**

The following impacts and activities have been registered in the protected area:

*Table No 4.3.7*

Code	Name	Int.	Imp.	%	Area dca
C01.01	Sand and gravel extraction	A	-	3	409,72
J02.06	Water abstractions from surface waters	B	-	4	546,30
J02.01.01	Polderisation	C	-	2	273,15
A04	Grazing	B	-	30	4097,21
B01.02	Artificial planting on open ground (non-native trees)	B	-	10	1365,74
A07	Use of biocides, hormones and chemicals	C	-	20	2731,48
A08	Fertilisation	C	-	20	2731,48
E03.01	Domestic waste disposal	C	-	10	1365,74
J02.05.02	Modifying structures of inland water courses	A	-	10	1365,74
F02.03	Leisure fishing	B	-	40	5462,95
F03.02.03	Trapping, poisoning, poaching	B	-	10	1365,74

The following impacts and activities have been registered outside the protected area:

*Table No 4.3.8*

Code	Name	Int.	Imp.
C01.01	Sand and gravel extraction	C	-
J02.06	Water abstractions from surface waters	C	-
A07	Use of biocides, hormones and chemicals	C	-
A08	Fertilisation	C	-
A04	Grazing	C	-

• **Prohibition mode.**

*Table No 4.3.9*

Conservation modes	Habitat code
Prohibition on all types of cutting.	91 E0
Prohibition on activities related to changing the hydrological status.	91 E0
Prohibition on changing the land purpose except when it benefits the public health and safety or due to other reasons of primary public interest including such resulting in exceptionally beneficial impacts to the environment.	91 E0

#### IV.4 Protected area BG0000508 “Skat River” under Directive 92/43/EEC

- **Identification and location of the area.**

**Protected area BG0000508 “Skat River”** has been established under Directive 92/43/EEC on the protection of natural habitats and of wild flora and fauna with Decision of the Council of Ministers No 122 of 2.03.2007 and Commission Decision from 12.12. 2008. Protected area under the Habitats Directive bordering a protected area under the Birds Directive. **The area is located on a total of 4085.90 dca.**

A map of the protected area is presented in *Appendix No 7.4* to the report.

- **General features.**

The protected area includes the course of the Skat River which is a right-hand tributary of the Ogosta River. Between the Villages of Tarnava and Altimir along the riverbed of the river, there is a relatively broad belt of *Salix alba*, *Populus nigra*, *Populus alba*, *Quercus robur* and *Fraxinus oxycarpa* (91E0). GPS - E 023 51' 56'' N 43 34' 541. 2 km to the North of Altimir, there is a dense forest of *Fraxinus oxycarpa* (91F0) with a high conservation value. Part of the river in the region of Altimir is one of the few remaining habitats of *Gobio anoscopus*. Three fish species included in Annex 2 of Directive 92/43 have been found in the Skat River.

*Table No 4.4.1.* below shows information about the habitat class distribution in the protected area as well as the percentage and size distribution.

*Table No 4.4.1*

<i>Habitat Class</i>	<i>% Coverage</i>	<i>Area dca</i>
Inland water bodies (Standing water, Running water)	3	123
Extensive grain crops (including rotation crops periodically let lie fallow)	36	1471
Improved pastures (artificially created from grass mixtures)	28	1144
Dry grass communities, steppe	18	735
Bogs, Marshes, Water fringed vegetation, Fens	3	123
Broad-leaved deciduous forests	12	490
<b>Total habitat cover</b>	<b>100</b>	<b>4086</b>

- **Conservation objectives and subjects.**

The conservation objectives within the protected area are as follows:

- **Preserving the area** of the natural habitats and species and populations habitats subject to conservation **within the protected area.**
- **Preserving the natural state of the natural habitats and habitats of species subject to**



conservation within the protected area, including the natural species composition for these habitats, the specific species and environmental conditions.

- Restoring if necessary the area and natural state of priority natural habitats and species habitats, as well as species populations subject to conservation within the protected area.

*The following habitat types included in Annex I to Directive 92/43/EEC and species included in Annex II of the same Directive are subject to conservation:*

Table No 4.4.2

<b>HABITAT TYPES listed in Annex I to Directive 92/43/EEC</b>							
CODE	Pr.	NAME	% cover	Pres.	Rel. surf.	Cons. Status	Global assessm.
3270		Rivers with muddy banks with <i>Chenopodium rubri</i> p.p. and <i>Bidention</i> p.p. vegetation	0.03	D			
3260		Water courses of plain to montane levels with the <i>Ranunculon fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation	0.06	D			
1530	*	Pannonic salt steppes and salt marshes	0.03	B	C	B	B
6250	*	Pannonic loess steppic grasslands	3.97	A	C	A	A
91F0		Riparian mixed forests of <i>Quercus robur</i> , <i>Ulmus laevis</i> and <i>Ulmus minor</i> , <i>Fraxinus excelsior</i> or <i>Fraxinus angustifolia</i> , along the great rivers ( <i>Ulmenion minoris</i> )	9	A	C	A	A
91E0	*	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> )	2.205	A	C	A	A
<b>Note:</b> the above stated habitats subject to conservation in the protected area as well as their percentage coverage in the territory of the protected area are pursuant to the latest available standard Natura 2000 Data form of PA BG0000508 from September 2010, and were updated later on during the inventory revision of the area habitats under the project “Mapping and determining the nature conservation condition of habitats and species – stage I” under OPE 2007 – 2013 and the updated data is presented in the description of the expected impacts on each habitat in section V.2.1 of this report.							

Table No 4.4.3.

MAMMALS, included in Annex II to Directive 92/43/EEC										
COD E	NAME (English)	NAME (Latin)	Resident	Migratory population			Assessment			
				Bree ding	Winterin g	Passing	Pop.	Con.	Iso.	Glo.
1355	European Otter	Lutra lutra	0-Ii				C	C	C	C
2609	Romanian Hamster	Mesocricetus newtoni	V				C	B	C	C
1316	Long-fingered bat	Myotis capaccinii	P				D			

Table No 4.4.4

AMPHIBIANS AND REPTILES, included in Annex II to Directive 92/43/EEC										
COD E	NAME (English)	NAME (Latin)	Resident	Migratory population			Assessment			
				Bree ding	Winterin g	Passing	Pop.	Con.	Iso.	Glo.

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1188	Fire-bellied toad	<i>Bombina bombina</i>	P				C	A	B	A
1279	Four-lined snake	<i>Elaphe quatuorlineata</i>	P				D			
1220	European pond terrapin	<i>Emys orbicularis</i>	C				C	A	C	B
1217	Hermann's tortoise	<i>Testudo hermanni</i>	P				C	A	C	A
1993	Danube crested newt	<i>Triturus dobrogicus</i>	P				C	A	B	A

*Table No 4.4.5*

<b>FISH, included in Annex II to Directive 92/43/EEC</b>										
<b>COD E</b>	<b>NAME (English)</b>	<b>NAME (Latin)</b>	<b>Resident</b>	<b>Migratory population</b>			<b>Assessment</b>			
				Bree ding	Winterin g	Passing	Pop.	Con.	Iso.	Glo.
1138	Mediterranean barbel	<i>Barbus meridionalis</i>	R				C	B	B	B
1149	Spined loach	<i>Cobitis taenia</i>	C				C	A	C	A
1122	Danube gudgeon	<i>Gobio uranoscopus</i>	R				C	C	A	C
1134	European bitterling	<i>Rhodeus sericeus amarus</i>	C				B	A	C	A

*Table No 4.4.6*

<b>INVERTEBRATES, included in Annex II to Directive 92/43/EEC</b>										
<b>COD E</b>	<b>NAME (English)</b>	<b>NAME (Latin)</b>	<b>Resident</b>	<b>Migratory population</b>			<b>Assessment</b>			
				Bree ding	Winterin g	Passing	Pop.	Con.	Iso.	Glo.
1032	Thick shelled river mussel	<i>Unio crassus</i>	R				C	A	C	A
1083	Stag Beetle	<i>Lucanus cervus</i>	R				C	C	C	C
1087	Rosalia longicorn	<i>Rosalia alpina</i>	R				C	C	C	C

• **Vulnerability.**

The water of the Skat River is polluted with dissolved soil fractions. Dams have been built to correct the river level. Threats are the changes in species composition, the forest management, the intensive use of arable land.

• **Impacts and activities in and near the protected area.**

The following impacts and activities have been registered in the protected area:

*Table No 4.4.7*

<b>Code</b>	<b>Name</b>	<b>Int.</b>	<b>Imp.</b>	<b>%</b>	<b>Area dca</b>
A03	Mowing/ cutting	A	-	30	1225,77
A08	Fertilisation	B	-	30	1225,77
A04	Grazing	A	-	30	1225,77
A05	Livestock farming and animal breeding (without grazing)	B	-	10	408,59
F02.03	Leisure fishing	C	0	10	408,59

C01.01	Sand and gravel extraction	C	0	1	40,86
E01.03	Dispersed habitation	A	-	3	122,58
E03.01	Domestic waste disposal	C	0	3	122,58
H01	Pollution to surface waters (limnic, terrestrial, marine & brackish)	B	-	3	122,58
J02.01.01	Polderisation	C	-	3	122,58
J02.05.02	Modifying structures of inland water courses	C	0	3	122,58
J02.07	Water abstractions from groundwater	B	-	3	122,58
J02.12	Dykes, embankments, artificial beaches, general	B	-	3	122,58

The following impacts and activities have been registered outside the protected area:

*Table No 4.4.8*

Code	Name	Int.	Imp.
A08	Fertilisation	B	-
A04	Grazing	A	-
C01.01	Sand and gravel extraction	C	-
E01.03	Dispersed habitation	A	0
E03.01	Domestic waste disposal	B	-
H01	Pollution to surface waters (limnic, terrestrial, marine & brackish)	C	-
J02.01.01	Polderisation	B	-
J02.06	Water abstractions from surface waters	C	-

• **Prohibition mode.**

*Table No 4.4.9*

Conservation modes	Habitat code
Prohibition on holding sanitary cutting with intensity below 5 %. In natural forests it is allowed and normal to have natural dead tree amount up to 5% of the total reserve. If the dead trees in the crop are below 5% of it, then no sanitary cutting should be planned or executed. In cases when sanitary cutting is executed, in each 1 ha must be left a minimum of 15 cub.m, of dead and dry trees.	91 F0
Prohibition on all types of restoration cutting.	91 F0
Prohibition on all types of cutting.	91 E0
Prohibition on activities related to changing the hydrological status.	91 F0 91 E0
Prohibition on production of fodder.	91 F0
Prohibition on fencing including for farms for intensive game breeding.	91 F0
Prohibition on grazing.	91 F0
Prohibition on changing the land purpose except when it benefits the public health and safety or due to other reasons of primary public interest including such resulting in exceptionally beneficial impacts to the environment.	91 F0 91 E0
Mandatory selective cutting.	91 F0
Preserving key biodiversity elements – old age islands, hollow trees, tranquillity areas, etc.	91 F0

#### IV.5 Description of the region and territory of the investment proposal – floristic and faunistic features of the environment.

Field surveys and monitoring in Radiana site, its adjacent territories and the closest part of the PA „Zlatiyata” have been performed for the purposes of the CAR and the EIAR during several periods in 2014 and the table below shows the key initial and final route points along which and near which the surveys have been performed along with periods they were performed. In a separate attachment to the report (*Annex No 8.3.*) is presented a more detailed report with dates, starting, final and key interim coordinates of these routes. The route, semi-stationary and stationary examination methods have been applied. Results from the field surveys of the closest protected areas from the Natura 2000 network within the project “Mapping and determining the nature conservation status of natural habitats and species – stage I” of the MoEW executed under OPE 2007-2013 have been used and the final conclusions have been published on the website of the MoEW together with the documentation for each area. Apart from this site visits and monitoring were performed (23,24.03.2010) by natural habitats experts (M.Mihailov) and birds expert (D. Kyutchukov) within the EIA procedure in 2010-2011 for the same site which resulted in EIA Decision No 21-9/2011.

Table No 4.5.-1

Starting and final points of the routes along and near which the monitoring was performed and periods of monitoring			
Visit No	Period of observation		Initial and final routes coordinates in WGS84 coordinate system (decimal degrees)
	Month, year	Calendar days	
1.	04.2014	28	i.p.43.733169397 23.778211027; f.p.43.733712557 23.777878316
		29	i.p.43.736725610 23.776877811; f.p.43.737667860 23.772592043
		30	i.p.43.738383034 23.772605845; f.p.43.736423301 23.766597112;
2.	05.2014	28	н.т43.739938569 23.769912720; к.т43.735815804 23.780227992;
		29	i.p.43.731621485 23.781924736; f.p.43.724312745 23.805260833;
		30	i.p.43.732835093 23.780114557; f.p.43.739526824 23.770450468;
3.	06.2014.	26	i.p.43.740639758 23.767054891; f.p.43.737691080 23.774464014;
		27	i.p.43.737540805 23.762127224; f.p.43.733222989 23.778772468;

##### IV.5.1 Brief overview of the registered plant communities within the region of the investment proposal.

According to the geobotanical area division (Geography of Bulgaria, 2002), NRRAW „Radiana” site which is located near the Danube River on the territory of Kozloduy Municipality, belongs to the *Euro-Asiatic steppe and Euro-Asiatic forest steppe areas, the Downstream Danube province, the Near Danube area, Zlatiyski area*. This area takes up the land westwards from Lom to the downstream of the Vit River. In the past the woods were composed of *Quercus virgilliana*

and Downy Oak (*Q. pubescens*). Nowadays there are remnants of forests predominating with South European flowering ash (*Fraxinus ornus*), more rarely Turkey oak (*Q. cerris*) and Downy Oak (*Q. pubescens*). At lot of areas are found also artificial Black Locust plantations (*Robinia pseudoacacia*), including in the region of the investment proposal. Commonly found here are the steppe species *Camphorosma monspeliaca*, *Potentilla pirotensis* and *Chamaecytisus danubialis*.

Presently the territory of the Radiana site is almost fully covered with dense forest vegetation.

According to literary data (Bondev, I., 1991), as wells as to the results of the performed site survey it was established that the site has territories with vegetation types as follows:

- Agricultural areas replacing mixed Turkey Oak (*Quercus cerris*) and *Quercus virgilliana* forests often with additions of *Q. pedunculiflora*, at present occupied by crops. Widely distributed in the northern part of the Danube plain mostly on Chernozems. Main crops grown are grain – mostly wheat and corn, as well as vines. Such areas are located south and west along the road Kozloduy – Harlets which passes south of the site.
- Artificial Black Locust plantations (*Robinia pseudoacacia*), which according to the vegetation map of Bulgaria in scale 1:600000 (Bondev, I., 1991) occupy exactly the territory of the site envisaged for the NRAWR (an excerpt of this map is included in Annex No 8 to the CAR).
- Mesoxerothermic vegetation with predominance of Bulbous Bluegrass (*Poa bulbosa*), Perennial Ryegrass (*Lolium perenne*), Bermuda grass (*Cynodon dactylon*), occasional spots of Bluestem (*Dichantium ischaemum*) and more rarely Scented Grass (*Chrysopogon gryllus*), mainly on village commonland. Such vegetation is distributed around the village of Harlets and to the southwest of it (around the village of Glozhene), also northwest of the town of Kozloduy, but near the site it is not present.
- Swamp and marshland hygrophitic (at places also hydrophitic) vegetation with predominance of Common Reed (*Phragmites australis*), Bulrush (mainly *Typha angustifolia* and *T. latifolia*), Clubrush (*Schoenoplectus lacustris*, *Sch. triquetra*, *Sch. tabernaemontana* etc.) and others. Such vegetation occupies areas east of the NPP “Kozloduy” site near the Ogosta River, but is not found in the Radiana site.
- Agricultural lands replacing forests of Field Elm (*Ulmus minor*), Raywood Ash (*Fraxinus oxycarpa*), *Quercus pedunculiflora*, etc. Such areas are located along the Ogosta River.

During the performed site survey was established that both the territory of the Radiana site and most of the adjacent areas (which are not roads and infrastructure elements of “Kozloduy” NPP) are occupied by a forest community dominated by (about 70-80 % of all species) the Black Locust (*Robinia pseudoacacia*), which leads to the conclusion that the site is located within a Black Locust forest. Apart from Black Locust the remaining 20 % are composed mainly of Thorny Locust (*Gleditschia triacanthos*), Small-leaved Lime (*Tilia cordata*), English oak (*Quercus robur*), Japanese pagoda tree (*Sophora japonica*), Common Ash (*Fraxinus excelsior*) and only occasionally Sycamore (*Acer pseudoplatanus*), Silver Birch (*Betula pendula*) and Field Maple (*Acer campestre*). In the undergrowth, where present, are found Cornelian Cherry (*Cornus mas*), Common Privet (*Ligustrum vulgare*), Common Dogwood (*Cornus sanguinea*) and others. As seen the above described tree community is dominated mainly by introduced species (Black Locust, Thorny Locust, Japanese Pagoda Tree) and pursuant to the Guide to defining habitats of Community importance in Bulgaria (2008) **cannot be referred to neither of the**



**habitats included in Annex I of Directive 92/43/EEC and respectively in Annex No 1 to the BDA, i.e. to natural habitats subject to conservation under Natura 2000.** In practice the described forest vegetation represents an artificial plantation created with protective purposes in terms of the facilities and installations on the site of “Kozloduy” NPP. The average age of the Black Locust which defines the plantation ranges around 20 years as there are older species too, i.e. the Small-leaved lime is about 38 years old and the English Oak is about 25 years old. As evidence to the CAR in *Annex No 8.2* is presented a report from State Forestry – Oryahovo which contains an overview of the commonly found species in the separate regions and sub-regions of the plantation near the Radiana site, which is fooled by a map of these regions and sub-regions. Their location is reflected on the attached plans of the land properties included within the Radiana Site (*Annex No 3.2*).

*IV.5.2 Determining the presence or absence of conservation species in the closest protected areas under Annex I to Directive 2009/147/EC and Annex. II to Directive 92/43/EEC within the scope of the investment proposal.*

IV.5.2.1 Bird species subject to conservation in the PA BG0002009 “Zlatiyata” and included in Annex I of Directive 2009/147/EC.

The most relevant circumstance here is that the IP area does not include parts of the territory of PA BG0002009 “Zlatiyata” but is located outside of it (at a distance of 0.45 km from Radiana site), which considering the nature of the site excludes the probability of significant direct negative impacts on the territory of the area, including on its flora and fauna and specifically on the bird population. In this case what matters is the function of the IP area with regard to the bird species representatives and couples and mostly to the priority species inhabiting the PA. Otherwise, what matters specifically is the importance of the NRAWR implementation to the various bird species in this PA.

The following should be stated more specifically:

- i. The various nesting couples of bird species in the PA cannot be nesting at the same time in the IP area;
- ii. Representatives of some species, including some couples nesting on the territory of the PA can also use the IP territory as part of their main trophic base. It is those species exactly that will be reviewed below, or rather, for which of those species the IP area in its current or future condition is of significance as a trophic base or in any other aspect and specifically what is its nature;

The contents of the Standard Data form show that in the region of PA BG0002009 “Zlatiyata” are found 28 bird species included in *Annex I of Directive 2009/147/EC*. For the purposes of this assessment, apart registering the presence or absence of representatives of those species, below have been analysed also some of the main ecological features related to the behaviour of the bird species listed in the Standard Data form during the breeding and nesting period as well as their trophic habitats in this part of the country.

– A042 Lesser white-fronted goose (*Anser erythropus*). In the past the species nested everywhere in Europe and Asia but nowadays its nesting area has diminished dramatically. The Little white-fronted goose is now a world threatened species, listed as “vulnerable” by the International Union for Conservation of Nature. In Bulgaria the species is wintering and passing. It inhabits coastal water bodies with various salinity and coastal sea waters, fresh water

lakes and dams, winter crops, etc. it is found mainly in the north-eastern area of the country including the Durankulak and Shabla lakes. Single representatives of the species have been observed in Burgas region, PA "Batova", PA "Pyasachnik Dam", as well as in the inner countryside. The number of wintering representatives of the species is estimated about 15-50 individuals. The trend of wintering representatives is unstable (it fluctuates significantly in various years). The main problem is poachers and hunters killing representatives of the species due to the significant resemblance to the Greater White-fronted Goose which is treated as game. In this case the nature of the IP – woodland excludes such activities and is not a trophic habitat for the species and is avoided by its representatives. The Standard Data form states that the PA territory is visited only by one wintering and passing representative. This representative compared to the total number of wintering representatives of the species in the country has been evaluated as (B) – 15%  $\geq p > 2\%$ ; The degree of conservation of the features of the habitat important for the species and the restoration possibilities have been evaluated as (A) – excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the representative is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the value of the site for conservation of the species is (B) – good value.

Both the site of the IP as well as the adjacent terrains due to their woodland nature do not offer habitats for the mentioned 1 representative of the species which spends the winter in the area or rests in it during its migrations. The site is located at sufficient distance from the habitats of the species in the PA (in its eastern part not far from which the Radiana site is located and there are practically no suitable habitats for representatives of the species) due to which no impacts on them can be expected as well as on the representative itself resulting from the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.). The closest habitats of the Lesser White-fronted Goose within the PA "Zlatiyata" are located along the banks of the Danube River at 5 km west from the town of Kozloduy, as well as in the region of Shishmanov val dam, located at about 11 km straight line to the west from the site and near the Butanski dam (12 km).

- A022 Little Bittern (*Ixobrychus minutus*). The main portion of the species couples in Bulgaria nest along the course of the Danube, along the Black Sea coast, the Danube plain and the Thracian lowland, the Sofia and other mid-mountain plains (along banks and river islands and standing water bodies overgrown with tall water vegetation and sometimes in very small water bodies). It is a nesting migratory species. Inhabits diverse wet areas with sufficient reed, bulrush and other vegetation. It is found also in isolated small water bodies with sufficient reed where the couple can hide their nest. It feeds mostly early in the morning and at dusk with small fish, frogs, tadpoles, water and other insects and invertebrates. The Standard Data form states that the PA territory is used for breeding by 10 couples (between 7 and 13). These couples, compared to the total number of the couples on the entire territory of the country, are evaluated as (C) – 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) – good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy); The degree of isolation of the nesting couples has been evaluated as (C) –

non-isolated nesting couples with wide habitation and distribution range of species couples in this part of the country. The global assessment of the value of the site for conservation of the species is (C) – significant value.

Suitable wet and water habitats in the eastern part of the PA not far from which the Radiana site is located are not found. Both the site of the IP as well as the adjacent terrains due to their woodland nature do not offer habitats for representatives or couples of the species. The closest habitats of the Little Bittern within the PA "Zlatiyata" are located along the banks of the Danube 5 km to the west of Kozloduy, as well as in the region of as well as I the region of Shishmanov Val dam located at about 11 km straight-line to the west from the site, as well as in the region of the Butan dam – at about 12 km. Due to these circumstances no tangible impacts on the habitats and the couples of the species in the PA and this part of the country, resulting from the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) should be expected.

- A403 Long-legged Buzzard (*Buteo rufinus*). The species nests in the northern part of the country to the west up to the Lom river valley, including in the Iskar gorge near the village of Karlukovo but is observed around the year and further west – in the region of the town of Belogradchik. During the migration is found mainly around the Black Sea coast and during the winter mainly in Southern Bulgaria. Inhabits rock complexes, deciduous forests, open and semi-open territories. Usually the birds roam above open and semi-open areas where they hunt (they also hunt when sitting, waiting for a suitable prey to appear). The couples build their nests mostly on rocks (in niches, terraces, and platforms), and also on large trees. They are a permanent and migratory species which feeds mainly with small mammals (mainly rodents), reptiles, birds. **The Standard Data form states that the PA territory is permanently inhabited by 6 nesting couples.** These couples compared to the species numbers in the country are evaluated as (C) –  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) – excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the representatives is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (B) – good value.

Parts of the IP site and some of the adjacent and open areas can be possibly reviewed also as parts of the nesting and trophic habitats of this species. In this case specifically no nesting couples have been registered on the IP site and in its proximity. The open territories near the site offer hunting conditions for representatives of the species and such conditions are present on almost the entire territory of the PA apart from the water areas and some urbanised areas. The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly in a significant degree the areas in the PA closest to the IP site, suitable for hunting, as the available trophic habitats of the species on its territory span on an area of nearly 417,500 dca and can be considered sufficient for providing the necessary feeding resources for the nesting couples of the species, which corresponds to the purposes and subject of PA "Zlatiyata".

- A031 White Stork (*Ciconia ciconia*). Found all around the country. Nests in residential areas and other built-up territories inclusion near wet zones. It is a migratory and passing species

which feeds mainly on reptiles, amphibians and fish, but also on insects and small mammals and birds (or rather baby birds). The Standard Data form states that the nesting complex of the species in the area consists of 66 nesting couples. This number of nesting couples, compared to these in the entire country, is evaluated as (C) – 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) – excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); the degree of isolation of the representative is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (A) – excellent value.

The IP territory due to its forest nature does not offer trophic habitats for representatives and couples of the species, even less places for nesting due to the lack of high building elements (buildings, facilities) and apart from this it is far from residential areas. There are no suitable wet and water habitats near which the birds prefer to seek food inside the eastern border of the PA not far from which the Radiana site is located and no residential areas either. Due to these circumstances no impacts should be expected on the habitats and the couples of the species in the PA territory resulting from the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.).

- A097 Red-footed Falcon (*Falco vespertinus*). In the last 25 years it has been found nesting in the country near Durankulak, Shabla, Kaliakra, Dobrudzha and in the Danube plain (mainly in Zlatiyata). New nesting colonies have been established in the Arda River valley and the Svetiilyski hills where 1–4 couples have been nesting every year from 1998–2004. It is a nesting-migratory and passing species. It nests including in colonies from mid-May (in wind protection belts using old nests of rooks and also on buildings and rock formations). It hunts on open areas including agricultural areas and also over water surfaces. The trophic range includes mainly insects, small reptiles and mammals. The Standard Data form states that the PA territory is used for breeding by 20 couples (between 2 and 38). These couples, compared to the total number of the nesting and migratory representatives in the entire territory of the country, are evaluated as (A) - 100%  $\geq p > 15\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) - good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy). The degree of isolation of the representative is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (A) – excellent value.

Parts of the IP site and some of the adjacent territories match the nesting habitats of the red-footed Falcon but not its feeding habits since the birds hunt mainly on open territories and sometimes over water bodies but not in forests. In this case no nesting has been registered in the IP site and in its proximity. There are no suitable nesting habitats in the eastern part near which the IP site is located, only trophic conditions. The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly in a significant degree the closest areas in the PA suitable for feeding the

representatives of the species, as the available territories and areas within the PA suitable for trophic habitats and near the Danube (around 26,000 dca) are completely sufficient for providing the necessary feeding resources for the nesting couples of the species, which corresponds to the purposes and subject of PA „Zlatiyata”.

- A021 Eurasian Bittern (*Botaurus stellaris*). Permanent species in Bulgaria. Up to the mid-XX century was found in big water bodies (swamps in the Sofiisko field, in the Batak, Straldzha and Radomir marshes and in the Upper-Thracian lowland), along the Danube and Black Sea coast, usually below 600 m alt. When the marshlands dried up in the 1950's the species diminished. It nests along the Black Sea coast (Durankulak, Shabla, Atanasovo lakes and the Poda area in Burgas region), in the Danube plain (the Kalimok area, the fisheries near the village of Mechka and Hadzhidimitrovo), in some areas in the Upper-Thracian lowland and Western Bulgaria. During the late 1990's its numbers increased in the Shabla and Durankulak lakes, the Dragoman marsh, the Hadzhi Dimitrovo fisheries, etc. but declined or disappeared in the former fisheries “Kalimok”, the Srebarna lake, etc. It inhabits large water bodies fringed with reed – marshes and lakes. It nests in reed plantations (over 20 ha) with water depth up to 30 cm. It relies on the availability of fresh water and brackish water bodies. The Eurasian Bittern searches for its food in the water. It feeds mainly on fish, frogs, tadpoles, snails, crustaceans and occasionally small rodents. **The Standard Data form states that the PA territory is permanently inhabited by 2 nesting couples.** The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) - good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy). The degree of isolation of the representatives is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (B) – good value.

There are no suitable wet and water habitats in the eastern part of the PA not far from where the Radiana site is located. Both the IP site and its adjacent territories, due to their forest nature, also do not offer biotopes for couples of the species. The closest habitats of the species within the PA “Zlatiyata” are situated along the banks of the Danube 5 km to the west from the town of Kozloduy, as well as in the region of Shishmanov Val dam located at about 11 km straight-line to the west from the site and near the Butan dam (12 km). due to these circumstances no negative impacts whatsoever can be expected on the habitats and the couples of the species in the PA resulting from the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.).

- A246 Woodlark (*Lullula arborea*). Found in various areas of the country, both in plains and mountains. Inhabits open territories in plain and mountain areas including woodlands. This species, despite being named woodlark, does not nest in woods or rather under the canopy of forests but always outside them – in open grasslands (the species nests exclusively on the ground and the nest is usually hidden among the grass and in some cases only in a furrow in the ground in areas with little or no grass cover. The species is nesting migrant arriving too early in its nesting areas, as early as February – March and has been a permanent and almost permanent species in the PA. Feeds on small insects and other invertebrates and seeds. **The Standard Data form states that the nesting complex of the species in the PA is presented**



**only by 5 couples.** This number of nesting couples of the species compared to its number on the entire territory of the country is evaluated as (D) – non-significant population.

In general the forest community where the IP area belongs does not offer nesting and trophic habitats for the species (there are no forest meadows, clearings or suitable open areas) and only resting conditions to some extent – birds can rest on the trees but only in the outskirts of the forest. In the area of the IP representatives in small to medium-sized flocks have been registered during the seasonal migration periods for this species – March and even in February – in open territories including residential areas. That is the reason the outskirts of the forest territory could probably have some significance as a resting place for birds temporary using the area of the IP during migrations, whereas all suitable habitats of the species in the PA "Zlatiyata" will continue to fulfil their function as a trophic base for the nesting couples of this species.

- A379 Ortolan Bunting (*Emberiza hortulana*). Found almost all over the country. Inhabits open and semi-open territories, mostly larger forest meadows, including in low mountain regions, is not found in mid- to high mountain areas. Also inhabits and nests in open territories with shrubs and trees, forest outskirts and young wood plantations, including coniferous, orchards, open areas cut by ravines and hollows, overgrown with sparse or dense shrubs and similar habitats. Nesting migrant. **The Standard Data form states that number complex of the species in the PA consists of 950 nesting couples and 10 individuals**, as their number compared to the numbers in all the country is evaluated as (C) – 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) – excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the representatives is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (A) – excellent value.

The nearly complete forest nature of the IP area and its adjacent terrains (including the road Kozloduy-Harlets and the inner access road of the NPP) does not offer suitable nesting and trophic habitats for this species. Occasional representatives might only use the trees on the outskirts for resting during the periods of seasonal migrations. Nesting attempts including near the forest area are not likely. No representatives and couples of the species have been registered near the forest, most probably due to the presence of several couples of the relative and rival bunting species – the Black-headed Bunting (*Emberiza melanocephala*), and also of the Corn Bunting (*Emberiza calandra*), which are close and larger (stronger) species. Trophic and nesting conditions are present in the eastern part of PA not far from where the IP is located but those are available mostly in open areas with shrubs and trees inside the area. The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) will not affect directly neither indirectly in a significant degree the closest habitats of the species in the PA, since the available areas in it (around 87,000 dca including part of the extensive grain crops) are fully sufficient for providing the necessary trophic and nesting resources for the representatives of the Ortolan Bunting, which corresponds to the purposes and subject of PA „Zlatiyata”.

- A242 Calandra Lark (*Melanocorypha calandra*). The species was extremely frequently found and numerous before 1950. Nowadays the nesting areas of the species in the country are

fractured and include areas in Dobrudzha, the Black Sea coast north of Balchik, some low mountain areas in Sakar and the Derventski heights, the Sandanski- Petrich field and parts of the Danube plain and the Thracian lowland. In the PA it is a permanent species. It nests in open areas on the ground among grasses of medium height. Inhabits steppes, grass communities in the moderate and sub-tropical zone, pastures, arable lands. **The Standard Data form states that the nesting complex of the species in the PA is represented only by 5 couples.** These couples compared to the overall number of the species in the country, are evaluated as (C) –  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) – good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy); The degree of isolation of the nesting couples has been evaluated as (C) – non-isolated nesting couples with wide habitation and distribution range of species couples in this part of the country. The global assessment of the value of the site for conservation of the species is (C) – significant value.

In general the forest community within the IP area does not offer nesting and trophic habitats for the species (there are no open areas with pastures, common lands, arable lands, etc.). Due to this the IP area is not of significance to the species since the suitable nesting and trophic habitats of the species in the PA „Zlatiyata” (around 400,000 dca), will continue to provide the necessary conditions for the nesting couples of this species in the area, as the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly in a significant degree on its closest habitats in the PA.

- A129 Great Bustard (*Otis tarda*). In the end of the XIX c. the species used to nest everywhere around the country (in vast open territories) but later was found only in the region of the village of Zlatiyata, Dobrudzha and Varna. Nowadays it is considered an extinct nesting species in the country. The latest two unconfirmed observations of nesting birds are from the mid 1990's – near the villages of Zlatiyata and Bezvoditsa, Dobrich region. After 1990 it was observed only in winter. It inhabits arable lands and pastures as during its nesting period it inhabits open steppe landscapes, virgin soil steppes rich in grass vegetation, mainly in the needle grass steppes. In this case the area is only inhabited by wintering species. **The Standard Data form states that only 5 individuals spend the winter in the PA territory.** These representatives, compared to the total number of the wintering representatives in the entire territory of the country, are evaluated as (A) –  $100\% \geq p > 15\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) – good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy). The degree of isolation of the representatives is evaluated as (B) – non-isolated number of representatives, but on margins of area of distribution. The global assessment of the possibilities for conservation of the species in the PA is (A) – excellent value.

The forest community where the IP area belongs and its adjacent terrains (including the road Kozloduy-Harlets and the inner access road of the NPP) does not offer habitats of the species (no arable lands and pastures). Due to this the IP area is not of significance to the species since the suitable nesting and trophic habitats of the species in the PA „Zlatiyata” (around 400,000 dca), will continue to provide the necessary conditions for the wintering representatives of this species, as the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly in a significant degree on its closest habitats in the PA.

- A299 Common Kingfisher (*Alcedo atthis*). Inhabits water bodies (with running and standing water mostly in low (below 1000 m altitude) areas of the country, as well as rivers, lakes, streams, sandy sea beaches. The couples nest in nesting shelters they dig in vertical and hardly accessible beaches for non-flying species within the water bodies or nearby (i.e. underground which explains the origin of the species' name in Bulgarian). It is a permanent species. During the winter some birds also roam to various parts of their water body as well as to other water bodies. It feeds on small fish and water insects. **The Standard Data form states that within the PA territory there are 6 nesting couples**, which compared to the total number of the couples of the species in the country are evaluated as (C) – 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) – good conservation (well conserved elements of the environment); the degree of isolation of the nesting complex is evaluated as (C) – non-isolated the nesting complex within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (C) – significant value.

The site of the IP itself does not offer suitable conditions for representatives of this species – neither for feeding nor breeding since within its territory as well as in its proximity there are no natural or artificial water bodies since the area is covered by a tree community of a typical forest nature. Near the site including in the part closest to the PA “Zlatiyata” habitats that can be affected in any direct or indirect manner by the implementation of the IP are also not found – the closest habitats of the species within PA “Zlatiyata” are located along the banks of the Danube at 5 km west of the town of Kozloduy as well as in the area of Shishmanov Val dam located at about 11 km straight line distance to the west from the site and near the Butan dam (12 km).

- A224 European Nightjar (*Caprimulgus europaeus*). Found almost everywhere in the country mainly in deciduous but also in mixed and coniferous forests including those with open areas – meadows, clearings, cutting areas and paths, etc. (the adult representatives hunt usually flying low or not high above the ground in open or semi-open territories, as well as above woods or similar areas with scarce tree vegetation. The species leads a furtive lifestyle and is active mainly in the evening and at night. It is a nesting migrant and passing species. Feeds on flying insects. **The Standard Data form states that the nesting complex of the species in the PA consists of 9 (2-16) nesting couples**, which compared to the total numbers of the species in the country are evaluated as (C) – 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) – good conservation (well conserved elements of the environment); The degree of isolation of the nesting complex is evaluated as (C) – non-isolated the nesting

complex within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (C) – significant value.

There are suitable nesting and trophic habitats in the area of the IP since the Radiana site is located in a dense deciduous forest territory. No representatives have been registered during the filed surveys in this forest area and in its proximity but it is possible to find some, mostly hunting representatives, and some during seasonal migrations. Within the PA “Zlatiyata” suitable habitat territories for representatives and couples of the species are found mostly in the further north part of the area bordering the Danube and situated at 5 km straight line distance to the west of the town of Kozloduy and at 12 km northwest of the site (according to the “Corine land cover system 2006” here are situated Deciduous forests / Corine code 311), and somewhat suitable areas also exist to the east and west of Shishmanov val dam (Transitional woodland-shrub/Corine code 324), the closest of which are at 8 km from the site. The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly nor indirectly these nesting and trophic habitats of the species in the PA, neither the adjacent open territories which can be reviewed as part of its trophic habitats.

- A402 Levant Sparrowhawk (*Accipiter brevipes*). Found in our country mainly along the big rivers Arda, Maritsa, Tundzha, Struma, the Danube and their tributaries as well as along the Black Sea coast. It nests on high trees usually in forest areas near rivers and other water bodies mainly in the low areas of the country. On the territory of the country it is a nesting migrant and passing species. **The Standard Data form states that the PA territory is used for breeding by 5 couples.** These couples, compared to the total number of the nesting and migratory representatives in the entire territory of the country, are evaluated as (A) – 100%  $\geq p > 15\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) – good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy). The degree of isolation of the representative is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (A) – excellent value.

The presence of tree vegetation on the site of the IP including large trees suggests using them for bases by the birds (for rest or spending the night) including ones from the PA, and possibly for nesting as well though less likely due to the proximity to the NPP area and parts of the road system. Apart from this there are sufficient areas of the forest territory as well as forest territories in other parts of the region to the west and east near the site. **In this part of the country couples of the species nest in strips of woods near large rivers.** Due to its dense tree and shrub vegetation coverage the IP area does not represent part of the trophic base of the species in the region (birds look for food in open territories and rarely in sparse forests). No representatives have been registered nearby but their eventual presence should not be completely excluded. In this case the most suitable habitats on the territory of the PA are located along the banks of the Danube at 5 km straight line distance to the west of the town of Kozloduy and at 12 km northwest of the site (according to the “Corine land cover system 2006” here are situated Deciduous forests / Corine code 311), and somewhat suitable areas also exist to the east and west of Shishmanov val dam (Transitional woodland-

shrub/Corine code 324), the closest of which are at 8 km from the site. The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) will not impact directly nor indirectly these habitats of the species in the PA.

- A243 Greater short-toed lark (*Calandrella brachydactyla*). A nesting migrant and a passing species in our country widely distributed in the past on its entire territory. Nowadays the species is split into separate small groups preserved only in areas with optimal nesting habitats. More numerous nesting groups have been registered and reported in Black sea Dobrudzha, the Besaparski hills, near Sliven and in some areas northwest of Sofia – near Dragoman and the villages of Bezden, Bogyovtsi and Golemo Malovo, and some parts of the Thracian lowland. It inhabits various open habitats, with no or scarce grass cover. Prefers dry rocky steppes and pastures. Found also on coastal dunes, arable lands and barren areas. It builds its nests straight on the ground. **The Standard Data form states that nesting complex of the species in the PA consists of 59 (11-108) couples.** These couples, compared to the numbers of these on the territory of the country, are evaluated as (B) – 15%  $\geq$  p > 2%. The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) - excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration). The degree of isolation of the representatives is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (A) – excellent value.

In general the forest community within the IP area does not offer nesting and trophic habitats for the species (there are no open areas with pastures, common lands, arable lands, etc.). Due to this the IP area is not of significance to the species since the suitable nesting and trophic habitats of the species in the PA „Zlatiyata” (around 400,000 dca), will continue to provide the necessary conditions for the nesting couples of this species in the area as the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly in a significant degree its closest habitats in the PA.

- A084 Montagu's harrier (*Circus pygargus*). In our country it is a nesting migrant, passing and wintering species. During the seasonal migrations and the autumn – winter period is found in the entire country – in open territories mostly in lower areas. Nowadays nests have been found mostly in Southeastern Bulgaria – along the valley of the Tundzha River near Elhovo, including in the region of the Derventski heights and some areas of Sakar and in the Maritsa valley and also in some areas of West Bulgaria (including the Sofiisko and Radomir fields), in lower areas of North-Western Bulgaria (reported during the first nesting period also in the north-eastern parts of the country). During the breeding period inhabits open territories, including wet zones (wet meadows, marshes and swamp territories). **The Standard Data form states that the nesting complex of the species in the PA consists of 12 migrant couples.** These couples, compared to the total number of the nesting and migratory representatives in the entire territory of the country, are evaluated as (B) – 15%  $\geq$  p > 2%. The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) – excellent conservation (elements in excellent



condition independent of the grading of the possibility of restoration). The degree of isolation of the representatives is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (A) – excellent value.

In general the forest community within the IP area does not offer nesting and trophic habitats for the species (there are no open territories and wet zones). Birds may use the trees on the outskirts of the forest for resting only occasionally. Representatives and couples of the species hunt and nest exclusively in vast open grass covered territories, and also in wet zones. In this part of the country representatives have been registered also during the breeding period (spring and summer) but not near the site where representatives have been registered and reported only in autumn and winter. This is the reason the IP area is not of importance to the feeding and nesting of the species since all suitable habitats for it on the territory of PA “Zlatiyata” (the area of Shishmanov Val dam located at about 11 km including the pen areas around it, the area near the Butan dam (12 km), will continue to provide the necessary conditions for the nesting couples of this species in the PA, as the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly its habitats in the PA.

- A511 Saker Falcon (*Falco cherrug*). Permanent and passing species, in the past found much more frequently unlike its present condition. In late XX c. and early XXI c. a catastrophic decline in its numbers was established. Two nesting habitats have been typical for the species in the country – flood woodlands and rock complexes in plain and mountain regions near open territories. With the diminishing of wet areas and flood forests the couples have established more often in the mountains. They nest on trees in other bird species’ nests or on rock ledges and niches (do not build nests, lay the eggs and sit on them on the rocky substrate or on dust, sand or other materials brought by the wind, eroded or fallen from the rock). Feeds mainly on small rodents (the European souslik has a significant share, including for feeding the young birds) and reptiles as well as birds. **The Standard Data form states that the PA territory is visited recurrently only by 1 passing individual**, which compared to the entire number of the species in the country is evaluated as (C) – 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) – good conservation (well conserved elements of the environment); the degree of isolation of the nesting complex is evaluated as (B) – non-isolated individual, but on margins of area of distribution. The global assessment of the possibilities for conservation of the species in the PA is (B) – good value.

As shown from the information above PA “Zlatiyata” is visited recurrently only by 1 representative which is not nesting in the area but only passing, i.e. the Radiana site has not been used as a nesting habitat by a couple of the species. Apart from this the forest territory including the IP site does not belong to the trophic habitats of the species since its representatives are not capable of hunting in forests mostly due to their vast wingspan (this species hunts mainly in vast open areas and semi-open territories). In recent decades the couples of the species prefer nesting on inaccessible rock formations but in mountains (mostly in Western Star planina). The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions

resulting from accidents with RCC of RAW, etc.) cannot impact directly neither indirectly the closest hunting territories of the representative passing through the PA.

- A026 Little Egret (*Egretta garzetta*). Colonies and representatives have been observed in various parts of the country – in areas around water bodies of both running and standing water. Inhabits marshes, lakes, rivers, dam, micro dams, canals, rice fields, sea coasts and similar habitats. Searches for food mainly in the shallow waters – frogs, small fish, water invertebrates. A permanent, migrant and passing species. **The Standard Data form states that the nesting complex of the species in the PA consists of 12 migrant couples**, which compared to the total number of the species in the country, are evaluated as (C) – 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) – good conservation (well conserved elements of the environment); the degree of isolation of the nesting complex is evaluated as (C) – non-isolated the nesting complex within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (B) – good value.

The site of the IP itself does not offer conditions for this species, neither for feeding nor for nesting since there are no natural or artificial water bodies in it or near it and it is located among a dense forest community. The site is also at a sufficient distance from the habitats of the species in the PA (in its eastern part not far from where the Radiana site is located such habitats are not found), due to which no impacts on them should be expected, neither on the couples resulting from the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.). The closest habitats of the Little Egret in the PA "Zlatiyata" are located along the banks of the Danube at 5 km west of Kozloduy, as well as in the area of Shishmanov Val dam located at about 11 km straight line distance to the west from the site and in the area of Butan dam (12 km).

- A089 Lesser Spotted Eagle (*Aquila pomarina*). A nesting migrant, passing and partially wintering species. It was found quite frequently in the past but during the period 1950–1980 became rarer. Nowadays nearly 50% of its population (350–400 nesting couples) is concentrated in the Eastern Rhodopes, Sakar, the Derwent heights and Strandzha, about 25% are concentrated in Eastern Stara planina and Eastern Sredna gora, and about 15% are in the Danube plain and along the banks of the Danube and its islands. It nests mainly on broad-leaved trees at a height of 6–25 m in already grown up beech, oak or mixed forests, old wind protection belts and other woodlands close to vast grassland communities and near agricultural lands in which the species and the couples hunt. **The Standard Data form states that the nesting complex of the species in the PA consists of 3 migrant couples**, which compared to the species numbers in the country are evaluated as (C) – 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) – good conservation (well conserved elements of the environment); The degree of isolation of the nesting complex is evaluated as (C) – non-isolated the nesting complex within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (C) – significant value.

The presence of tree vegetation on the site of the IP and in its proximity including large trees suggests their use for bases by the birds (for rest or spending the night) including ones from the PA, and possibly for nesting as well, though less likely due to the proximity to the NPP

area and parts of the road system. Apart from this there are sufficient areas of the forest territory as well as forest territories in other parts of the region to the west and east near the site. Due to its forest nature the IP area does not represent part of the trophic base (territories) of the species in the area. No nesting or other representatives have been registered in the area of the IP. The species nest in the PA but there are no suitable nesting habitats in its eastern part not far from where the IP site is located – there are only hunting conditions as those are available also on almost the entire territory of the PA (apart from water areas (not including their banks) and some urbanised territories). The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly in a significant degree the closest areas in the PA suitable for successful hunting of representatives of this species. Apart from this the suitable trophic habitats for representatives and couples of the species in the PA span on an area of about 413,000 dca are fully sufficient for providing the necessary resources of the couples nesting there, which corresponds to the purposes and subject of PA „Zlatiyata”.

- A098 Merlin (*Falco columbarius*). Found in our country only as wintering and passing species during seasonal and other migrations. During the winter migrations can be found in open and forest regions but not with very dense vegetation. Inhabits various regions such as open areas with wind protection belts as well as forest areas but not with very dense vegetation. **The Standard Data form states that the number of the species in the PA is 4 (3-5) wintering representatives and one passing individual.** This number of representatives, compared to all representatives wintering on the territory of the country or resting during migrations is evaluated as (D) – non-significant population.

In the area and in the country representatives of the species only spend the winter and pass mostly during the seasonal migrations. Due to the presence of small passerine birds during the autumn-winter period (resting or spending the night) in the forest area where the IP site is located which fly over in search of food to nearby or faraway open grasslands, the territory can be considered as part of the trophic base of the species but with insignificant range in this part of the country and with no important contribution to the conservation of the natural status of the habitats of the species in the PA. The trees offer birds of the species places to rest and spend the night. No representatives were registered during the field surveys in the area of the IP. There are sufficient suitable habitats in the PA – about 8,700 dca natural and cultivated tree areas which can provide paces to rest and spending the night of the small number of marlins found in this part of the country. The eastern part of the PA, not far from where the IP is located, also offers suitable trophic and resting conditions for the species, and such are available also in the open territories inside the area. The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly in a significant degree the closest suitable habitats of the species in the PA, and the areas in it covered by grass communities, arable agricultural lands and deciduous forests are fully sufficient to continue to provide the necessary resources for resting and feeding of the wintering birds of this species in this part of the country and in the PA, which corresponds to the purposes and subject of PA „Zlatiyata”.

- A080 Short-toed Eagle (*Circaetus gallicus*). Registered also as nesting in various parts of the country – in plain, fore mountain and low mountain areas. The couples nest on high trees usually in forests and woodland territories, but the birds hunt in open and semi-open territories, in rocky or stone covered terrains and sparse forests, including with meadows,

cutting areas, clearings but not in dense forest or shrub-forest areas. Nesting migrant. Feeds mainly on reptiles but also on amphibians, small mammals, insects. **The Standard Data form states that the nesting complex of the species in the PA consists of 4 migrant couples.** This number of nesting couples, compared to the species numbers in the country, is evaluated as (C) – 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) – excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the nesting in the PA couples is evaluated as (C) – non-isolated nesting couples within extended distribution range; The global assessment of the possibilities for conservation of the species in the PA is (C) – significant value.

The IP area and the rest of the forest territory covered by broad-leaved plantation do not offer hunting conditions for representatives of this species, but the presence of tall trees there offers conditions for rest and spending the night by the representatives, including for ones from the PA, and eventually for nesting as well, however unlikely due to the proximity of the area to the NPP and parts of the road network. In this case no nesting or any representatives have been registered in the IP area. The species nest in the PA but there are no suitable nesting habitats in its eastern part not far from where the IP site is located – there are only hunting conditions as those are available also on almost the entire territory of the PA (apart from water areas and some urbanised territories). The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither in any significant degree indirectly the closest areas in the PA suitable for successful hunting and nesting of couples of this species. The available areas within the PA, covered with deciduous forests and forest crops span on nearly 8,700 dca and are fully sufficient for providing the necessary trophic and nesting resource for the couples nesting there, which corresponds to the purposes and subject of PA „Zlatiyata”.

- A072 European Honey Buzzard (*Pernis apivorus*). Found in our country mainly in mountain and forest regions – in Stara planina, Rila, Pirin, the Rhodoppes, Sredna gora, Strandzha, Sakar, etc. and less frequently in plains. A nesting-migrant widely distributed in the past. In the early 1980's its number ranged around 200–350 couples. Inhabits and nests in forest territories with medium aged and mature forests. **The habitable area of the forest territory required for the normal existence of one couple ranges around 50-100 km<sup>2</sup>, and in the area of Radiana site there is no such vast territory occupied by forest vegetation** (the forest here covers about 950 dca or about 1 km<sup>2</sup>, and bigger areas exist along the Danube east of the village of Gorni Tsibar and the islands in the region). **The Standard Data form for the protected area states that the nesting complex of the species in it consists of 2 couples,** whose number compared to the species number in the country is evaluated as (C) – 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) – good conservation (well conserved elements of the environment). The degree of isolation of the nesting couples has been evaluated as (C) – non-isolated the nesting complex within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (C) – significant value.

In the woods within the PA „Zlatiyata” as stated above nest 2 couples of European Honey Buzzards. Within and near the IP area nesting couples have not been registered and there are no reports for such. During the field surveys in the IP site and in its proximity no roaming or food searching representatives have been registered and no reports for such exist, but they should not be excluded completely. The presence of tree vegetation on the site of the IP and in its proximity including large trees suggests their use for bases by the birds (for rest or spending the night) including ones from the PA, and possibly for nesting as well, though less likely due to the proximity to the NPP area and parts of the road system. Apart from this the IP area has no significant value in relation to PA „Zlatiyata”, since on one hand it is outside of it and on the other it is far away from the forest territories in the area. In this case the most suitable habitats on the territory of the PA are located along the banks of the Danube at 5 km straight line distance to the west of the town of Kozloduy and at 12 km northwest of the site (according to the “Corine land cover system 2006” here are situated Deciduous forests / Corine code 311), and somewhat suitable areas also exist to the east and west of Shishmanov val dam (Transitional woodland-shrub/Corine code 324), the closest of which are at 8 km from the site. The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) will not impact directly nor indirectly these habitats of the species in the PA.

- A255 Tawny Pipit (*Anthus campestris*). A nesting migrant and a passing species which can be found in low areas almost all over the country. Inhabits open territories, including ones occupied by wheat and other grain crops and open stone covered and dry grasslands in the low areas of the country. It is a ground species – the couples build their nests on the ground and search for their food among the grasses. **The Standard Data form states that nesting complex of the species in the PA consists of 84 (38-130) migrant couples.** These couples, compared to the total number of birds on the entire territory of the country, are evaluated as (B) - 15%  $\geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) - excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration). The degree of isolation of the representative (and the couples) is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (A) – excellent value.

In general the forest community within the IP area does not offer nesting and trophic habitats for the species (there are no open areas with pastures, common lands, arable lands, barren lands, etc.). Birds may use the trees on the outskirts of the forest for resting and spending the night only occasionally and outside the nesting period since no nesting couples of this species have been registered nearby also because of the distance the PA territory, where they nest. This is the reason the IP area is not of importance to the species, since all suitable habitats of the species in the PA „Zlatiyata” (about 400,000 dca) will continue to provide the necessary conditions for the nesting couples of this species in the PA. Apart from this the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact negatively directly, neither indirectly its closest habitats in this PA.

- A082 Hen Harrier (*Circus cyaneus*). Passing, wintering and probably nesting species. In the past was reported mainly in the eastern plain areas of the country and the Black Sea coast. During the recent decades has been registered in its breeding period on various places in plain



areas of the country, but no nesting was observed and the registered representatives were mainly lone males. The habitats of the species include mostly grass communities, arable lands, wet zones and fresh water bodies with running and standing waters. **The Standard Data form states that the nesting complex of the species in the PA consists of 7 (5-10) wintering representatives and 15 resting during migrations.** This number of representatives, compared to all representatives wintering on the territory of the country and resting during migrations is evaluated as (D) – non-significant population.

There are no suitable habitats for hunting of representatives of the species within the forest territory with the IP area since the Radiana site is located within a dense deciduous plantation whereas the species prefer open territories and wet zones. Birds may use the trees on the outskirts of the forest for resting only occasionally. Resting and feeding conditions exist in the eastern part of the PA not far from which the IP area is located and also mostly in the open territories inside the PA, including near Shishmanov Val dam. The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact negatively directly neither indirectly in a significant degree the closest habitats of the species in the PA, since the ones existing in it (dry grassland communities, extensive grain crops, water bodies and wet zones) are fully sufficient to provide the necessary feeding resources to the wintering representatives of this species, which corresponds to the purposes and subject of PA „Zlatiyata”.

- A029 Purple Heron (*Ardea purpurea*). The species inhabits marshes, lakes, river spills and wet zones. During migrations is found also in carious artificial water bodies. Migrates in small flocks sometimes with other species of herons. **The Standard Data form states that the nesting complex of the species in the PA is presented by 5 migrant couples,** which compared to the species number on the entire territory of the country is evaluated as (B) – 15%  $\geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) – good conservation (well conserved elements of the environment). The degree of isolation of the nesting complex is evaluated as (C) – non-isolated the nesting complex within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (A) – excellent value.

The site of the IP itself does not offer suitable conditions for representatives of this species – neither for feeding nor breeding, since within its territory as well as in its proximity there are no natural or artificial water bodies since the area is covered by a dense forest community. The site is distant enough from the habitats of the species in the PA (in the eastern part where the Radiana site is located there are no marshes, lakes, rivers and wet zones), due to which no impacts on them nor on the couples resulting from the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) should be expected. The closest habitats of the Purple Heron within the PA „Zlatiyata” are located along the banks of the Danube at 5 km west of the town of Kozloduy as well as in the area of Shishmanov Val dam located at about 11 km straight line distance to the west from the site and near the Butan dam (12 km).

- A127 Common Crane (*Grus grus*). A passing and rarely partially wintering species in our country which near the late 20 c. used to nest along the Danube coast and in open territories

inside the country. Until the first half of the 20 c. during its nesting period it was observed all around the country – in the Pleven, Dobrich, Varna, Burgas, Sofia, Plovdiv, Rhodope regions. Inhabits vast plain (or rather vast open territories), including near water bodies in fore mountains and mountains. During the seasonal migrations has been observed in meadows, fallow lands, fields, rice fields, river spills, forest meadows, etc. **The Standard Data form states that the number complex of the species in the PA consists of 10 representatives resting during migrations.** This number of resting representatives, compared to the number of passing through the country, is evaluated as (C) –  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) – excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration). The degree of isolation of the resting in the PA representatives is evaluated as (C) – non-isolated representatives within extended distribution range; the global assessment of the possibilities for conservation of the species in the PA is (C) – significant value.

Within the range of the forest territory where the IP area is located there are no suitable habitats for resting representatives of the species, since the Radiana site is located among a dense deciduous forest whereas the species inhabits open territories. Resting and nesting conditions are present in the eastern part of PA not far from where the IP is located, as those are available mostly in open areas inside the area and also near Shishmanov Val dam and Butan dam. The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly in a significant degree the closest habitats of the species in the PA, since the ones existing in it (dry grassland communities, steppes (17,400 dca) and territories with permanent use as extensive grain crops – 391,500 dca) are fully sufficient to provide the necessary resources to the passing representatives of this species, which corresponds to the purposes and subject of PA „Zlatiyata”.

- A234 Grey-headed Woodpecker (*Picus canus*). Permanent species found in forests in the low areas of the country, including town parks (Kyuchukov 1995 a, b, 2000 a, 2001, 2002). Inhabits and nests already developed and highly thickened broad-leaved and mixed forests and wood parks. **The Standard Data form states that the nesting complex of the species in the PA consists of 14 nesting couples,** which compared to the species numbers in the country are evaluated as (C) –  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) – excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the nesting complex is evaluated as (C) – non-isolated nesting complex within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is evaluated as (B) – good value.

The IP area, due to the presence of tree vegetation on it must be evaluated as suitable for a trophic habitat of couples of the species, but not for an optimal nesting habitat because the tree community is relatively young (the average age of the Black Locust which defines the plantation ranges around 20 years as there are older species – the oldest trees are some representatives of Small-leaved Lime – around 38 years). No representatives have been registered but it is possible to be found mainly during food migrations (roamings) during the

autumn-winter period. In this case the IP area can be evaluated only as a suitable trophic habitat for the representatives of the species, but with no significant value in terms of the individuals from PA „Zlatiyata”, as on one hand it is outside of it, and on the other it is far away from the forest territories there. In this case the most suitable habitats on its territory are located along the banks of the Danube at 5 km west of Kozloduy and at 12 km north-west of the site (according to the “Corine land cover system 2006” here are situated Deciduous forests / Corine code 311), and somewhat suitable areas also exist around Shishmanov Val dam (Transitional woodland-shrub/Corine code 324), the closest of which are located at 8 km from the site. In this case the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly nor indirectly these habitats of the Grey-headed Woodpecker in the PA and of its couples nesting there. Apart from this it is necessary to add that there will be sufficient terrains covered with tree and shrub vegetation in the IP area as well as forest areas which will continue to perform the function of potential trophic base for representatives of the species, since the specific areas of the IP planned for dense building up cover about 20 % of the site itself (or 87 dca), whereas the undisturbed areas will be 132.6 dca within the site with a total area of 464 dca, which on their part represent a forest community area covering a total of 950 dca, so about 620 dca of forests will remain undisturbed in the region on the territory which will continue to offer feeding conditions for the representatives and couples of the species.

- A231 European Roller (*Coracias garrulous*). Nesting migrant and passing species, which was found in the past almost on the entire territory of the country in plain and hilly areas and fore mountains up to an altitude of 800–1000 m. Currently nests in various parts of the country – along large rivers – the Danube and its tributaries, Maritsa, Tundzha, etc., in the Ludogorie, Dobrudzha, Southeastern Bulgaria, at places in Western Bulgaria, mainly along the Struma valley. The most numerous population is around the Danube. Inhabits deciduous forests and their outskirts, strips of woods along rivers, open areas with tree groups and other habitats with large trees, rock formations with hollows, ravines, dry valleys, earth and loess walls convenient for nesting. Nests in tree hollows as a secondary nesting species, in rock hollows and holes dug out by the couples in sandy or loess banks. Searches food in open territories. **The Standard Data form states that the nesting complex of the species in the PA consists of 77(24-13) migrant couples**, which compared to the numbers of these on the entire territory of the country, are evaluated as (B) – 15%  $\geq$   $p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) - excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration). The degree of isolation of the nesting couples is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (A) – excellent value.

Within the boundaries and near the IP area have been registered no nesting couples of the species and no flying over birds in search of food. In this case as the short overview of the ecology of the species above shows, it prefers to nest in forests located along the banks of the Danube in this part of the country (and on islands in the river) and to search for food in the open territories nearby. The closest forest areas in the PA „Zlatiyata” which offer optimal conditions for couples of the species, are located at about 12 km north-west of the IP site (according to the “Corine land cover system 2006” here are situated Deciduous forests / Corine code 311). In this case the potential local impacts on the environment during the

construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly nor indirectly the habitats of the European Roller in the PA and its nesting couples there.

– A429 Syrian Woodpecker (*Picoides syriacus*). Found around the entire territory of the country but in low areas. **It is the most numerous woodpecker species in residential areas in our country (Yankov, 1986) and in the low parts of the country** (up to 900-1000 m alt.), as in this altitude range only in territories with significant large forest plantations it is exceeded by the Great Spotted Woodpecker. In residential areas it nests in various places where trees with thick enough trunks and hollows from internal rotting are available, including parks within the towns (Kyuchukov, 1995 a, b, 2000 b, c, 2001, 2002). Inhabits settlements, industrial and other built-up areas, deciduous and mixed forests, parks, orchards, vineyards, roadside plantations, wind protection belts, banks of water bodies with old trees, island forests and single trees in open areas. A permanent species. Feeds mainly on insects but also on fruit and seeds (especially nuts). **The Standard Data form states that the local nesting complex in the PA consists of about 682 (134-1230) nesting couples**, which compared to the number of the species on the entire territory of the country are evaluated as  $c(B) - 15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) - excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration). The degree of isolation of the representatives (and the couples) is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (A) – excellent value.

The forest territory with the IP site should be evaluated as suitable habitat for feeding and somewhat for nesting of couples of the species, since part of the trees there are of large size. No representatives were registered during the filed surveys in the IP area, but it should not be excluded especially during the autumn-winter while roaming and searching for food. The implementation will affect some insignificant part of the trophic base of the species in the area by removing part of the tree vegetation in the forest territory. This territory might also be considered to some extent as part of the nesting base of the species but with a lesser probability, since the couples avoid dense forest areas such as this one when nesting. This is the reason that the main part of the couples of the species in the IP area nest mostly in residential areas and other built-up territories, as well as near them – in places with sparse tree vegetation, riparian forests, orchards, etc. and similar habitats with scarce tree and shrub vegetation. As stated above, the species is the most commonly found species of woodpecker in residential areas (Piciformes, Picidae) in the country (Yankov, 1986). Actually the IP territory has no significant value in terms of PA „Zlatiyata”, as on one hand it is outside of it, and on the other it is far away from the forest territories in the area itself, as well as from the residential areas in the region. The most suitable habitats for the Syrian Woodpecker on the territory which are outside of the residential areas are located along the banks of the Danube at 5 km straight line distance to the west of the town of Kozloduy and at 12 km northwest of the site (according to the “Corine land cover system 2006” here are situated Deciduous forests / Corine code 311), and somewhat suitable areas also exist around Shishmanov Val dam at about 8 km and around Butanski dam at about 10-11 km Transitional woodland-shrub/Corine code 324). In this case the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly nor indirectly these



habitats of the Syrian Woodpecker in the PA and of its couples nesting there. Apart from this it is necessary to add that there will be sufficient terrains covered with tree and shrub vegetation in the IP area as well as forest areas which will continue to perform the function of potential trophic base for representatives of the species, since the specific areas of the IP planned for dense building up cover about 20 % of the site itself (or 87 dca), whereas the undisturbed areas will be 132.6 dca within the site with a total area of 464 dca, which on their part represent a forest community area covering a total of 950 dca, so about 620 dca of forests will remain undisturbed in the region on the territory of which for the representatives and couples of the species will continue to exist feeding and breeding conditions.

- A103 Peregrine Falcon (*Falco peregrinus*). Permanent species found in various areas of the country. Its numbers amount to about 200 nesting couples with an increasing trend. Inhabits rocky areas – gorges, rock formations, rocky crowns from sea level altitude to sub-Alpine and Alpine areas (in various parts of the species habitats including in our country have been registered birds inhabiting high buildings and facilities). When hunting it circles a certain areas at a significant height, sometimes over one kilometre. Hunts both in open territories, and above woods – according to the preferred trophic objects the species feeds on other birds. **The Standard Data form states that in the PA nests only one couple.** This couple compared to the species number in the country, is evaluated as (C) – 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) – excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the nesting in the PA couples is evaluated as (C) – non-isolated nesting couples within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (C) – significant value.

In this case the couple inhabiting the PA „Zlatiyata” does not nest in the IP area but might be visiting it during flyovers in various directions in search of food/prey. In this case no representatives were registered during the field surveys in the IP area (apart from these in the nesting couple and its youngsters) but other birds can appear in the area during roaming and mostly during seasonal migrations and roamings during the autumn-winter period. The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly in a significant degree the closest areas in the PA, suitable for hunting of representatives of the species. Apart from this the suitable territories for trophic/hunting habitats in the PA span on an area of over 400,000 dca and are fully sufficient for providing the necessary resources of the couple nesting there (since the species feeds on other birds its representatives are capable of hunting on the entire territory of the PA), which corresponds to the purposes and subject of PA „Zlatiyata”.

- A083 Pallid Harrier (*Circus macrourus*). Passing and wintering species in the country. In the past used to nest in Dobrudzha, around Ihtiman and Pazardzhik as well as near the village of Dabravino, Varna region. In the recent decades was registered only during seasonal migrations and wintering. Inhabits open areas (steppes, meadows, marshy lowlands and other wet zones, arable and non-arable agricultural lands). **The Standard Data form states that the number of the species in the PA consists of 4 (3-5) representatives resting in passage.** This number of representatives, compared to all representatives, resting during migrations and wintering in the country, is evaluated as (D) – non-significant population.



Within the IP area there are no suitable habitats for hunting of wintering representatives of the species, since the Radiana site is located within a dense deciduous forest whereas the representatives of this species inhabit and hunt in open territories. Only occasionally representatives might alight on the trees in the outskirts of the forest area while hunting in the IP area. Feeding and resting conditions are available in the eastern part of the PA, not far from where the IP is located and mostly in the open territories near the dams inside the PA. The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly in a significant degree the closest habitats of the species in the PA, since the ones existing in it (dry grassland communities, steppes (17,400 dca) and territories with permanent use as extensive grain crops – 391,500 dca) are fully sufficient to provide the necessary feeding resources to the passing and wintering representatives of this species, which corresponds to the purposes and subject of PA „Zlatiyata”.

- A081 Western Marsh Harrier (*Circus aeruginosus*). Can be found in open territories in various parts of the country usually with wet zones present. Inhabits open territories, including water bodies (marshes, lakes, rivers) and wet zones overgrown with dense higher water vegetation (*Typha sp.*, *Phragmites sp.*, *Scirpus sp.* etc.). During migrations and wintering also inhabits open territories. A permanent, migrant (passing) and wintering species. Feeds on floating birds and other waterfowl, reptiles, small mammals and even fish. **The Standard Data form states that the number complex of the species in the PA consists of 8 nesting couples, 2 (1-3) wintering representatives and 10 resting during migrations.** This number compared to all nesting, wintering and resting during migrations representatives of this species in the country, is evaluated as (B) – 15%  $\geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) – excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration). The degree of isolation of the representatives/the couples is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (A) – excellent value.

In the IP site as well as within the entire forest area where it belongs there are no suitable habitats for hunting of representatives, and for nesting of couples of the species since they are not able to hunt in dense forest vegetation (due to the large span of their wings and due to the specifics of their flight). Only occasionally representatives might alight on the trees in the outskirts of the forest area. Feeding and resting conditions are available in the eastern part of the PA, not far from where the IP is located and mostly in the open territories near the dams inside the PA. The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly in a significant degree, the closest habitats of the species in the PA. apart from this the open areas in it are fully sufficient for providing the necessary resources for the nesting, wintering and passing representatives of the Western Marsh Harrier in the IP area and in the PA territory, which corresponds to the purposes and subject of PA „Zlatiyata”.

- A338 Red-backed Shrike (*Lanius collurio*). Observed on the entire territory of the country including in residential areas. This species is too numerous in our country and is found in areas at sea level altitude to rather high places (up over 2000 m). Inhabits and nests in lower

tree vegetation in open territories, outskirts and sparse forest areas, in shrub-grass and shrub-forest terrains with grassland inside or nearby, clearings, parks in villages and towns (Kyuchukov, 1995, 2000, 2002) and other similar habitats. Nesting migrant and passing species in the country. Feeds on insects and other invertebrates but also small birds, mammals, reptiles and amphibians. **The Standard Data form states that the nesting complex of the species in the PA consists of 1600 nesting couples**, which compared to the species number in the country are evaluated as (C) – 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) – excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); the degree of isolation of the nesting complex in the PA is evaluated as (C) – non-isolated nesting complex within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (B) – good value.

Birds of this species might use the trees for resting but only on the outskirts of the forest territory where the IP area is located. Nesting attempts are unlikely. Near the forest area representatives and couples have been registered on lower trees in nearby open territories, including on trees on both sides of the road to Kozloduy, as well as near arable agricultural lands. Due to the dense coverage of trees and shrubs it is not part of neither the trophic nor nesting base of the species in the area since its representatives avoid dense forest areas. The Red-backed Shrike is a rather numerous species in the country including in this region (1600 couples in the PA), due to which it is out of any danger – it inhabits and nests in a number of residential areas as well as in various built up territories (yards of factories, warehouse bases, etc.), and even inside them. Considering that after the completion of the construction activities the site will be improved by gardening and similar landscaping measures around the already built buildings and the repository itself, it is possible couples of the species to start nesting on shorter and still younger broad leaved trees since the representatives and the couples of the species tolerate the human presence (at a proximity of several meters). There are numerous suitable feeding and nesting places for the Red-backed Shrike in PA „Zlatiyata”. Due to this circumstance the implementation of the IP will not affect the condition of this species in this part of the country and the area of the IP in a sensitive aspect, and the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly in a significant degree the closest habitats of the species in the PA, as the existing numerous places suitable for feeding and nesting of representatives of the species will continue to provide the necessary resources for the nesting complex of the species there which corresponds to the purposes and subject of PA „Zlatiyata”.

- A073 Black Kite (*Milvus migrans*). Nesting migrant, passing and partially wintering species. Found relatively frequently in the past around the rivers Danube, Maritsa, as well as near the Black Sea coast. In recent years the nesting numbers in the country is estimated to 130–170 couples. During the breeding season it is mostly found along the Danube and its tributaries, along the courses of Maritsa, Tundzha and their tributaries, in Sakar and the Derventski hills. During roamings and migrations it can be seen anywhere in the country but its migration is more significant near the Black Sea coast. Inhabits plain and hilly areas of the country, except for the mountain zone above 1000 m altitude. Prefers areas near wet zones even if there's higher anthropogenic pressure. Nests on trees. **The Standard Data form states that in the PA nests only one couple.** This couple compared to the numbers of the species in the

country, is evaluated as (C) – 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (B) – good conservation (well conserved elements of the environment). The degree of isolation of the nesting couple is evaluated as (C) – non-isolated nesting couple within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (C) – significant value.

The presence of tree vegetation on the site of the IP and in its proximity including large trees suggests their use for bases by the birds (for rest or spending the night) including ones from the PA, and possibly for nesting as well though less likely due to the proximity to the NPP area and parts of the road system. Apart from this after the implementation of the IP there will remain sufficient areas of the forest territory as well as forest territories in other parts of the region to the west and east near the site. In various areas of the country, including this, a significant part of the couples nest in forests near rivers and other water bodies. In this case the couple inhabiting PA „Zlatiyata” does not nest in the IP area most likely because site is relatively far away from the course of the Danube. Most suitable areas in this respect are the forest territories in the PA located at 12 km northwest of the site along the Danube and along the banks of its tributaries (according to the “Corine land cover system 2006” here are situated Deciduous forests / Corine code 311). Near the IP site there are no wet zones either in which the birds of the species often hunt. In this case the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly nor indirectly these habitats of the species in the PA and the couple nesting there which corresponds to the purposes and subject of PA „Zlatiyata.

- A339 Lesser Grey Shrike (*Lanius minor*). Found almost on the entire territory of the country. Inhabits open plains or low mountain areas with single trees or tree groups, shrub communities and patches, strips of trees, shrubs including ones in mosaic patterns among grasslands. Nests in the tree crowns and shrubs often at significant heights (over 4-5 m). Nesting migrant and passing species. Feeds mainly on insects and other invertebrates but also on small reptiles, amphibians and the youngsters of small birds and mammals. **The Standard Data form states that in the PA breed about 100 (95-200) nesting couples,** which compared to the national number of the species are evaluated as (B) – 15%  $\geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibilities are evaluated as (A) - excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration). The degree of isolation of the representatives/the couples is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (A) – excellent value.

Birds of this species might use the trees for resting but only on the outskirts of the forest territory where the IP area is located. Nesting attempts are unlikely. Due to the dense coverage of trees and shrubs it the IP area is not part of neither the trophic nor nesting base of the species in the area. No representatives have been registered near the forest area. On the area of the IP itself which is an artificially created dense forest community there are no typical trophic and nesting habitats for the species (stated above), due mostly to the fact that the couples avoid dense forest vegetation when feeding and nesting. A possibility only exists some representatives to pass through this area (only the outskirts of the forest territory) during

migrations and roaming and might use the trees for resting and observations while looking for food in the nearby grasslands. On the territory of the PA itself there are numerous places suitable for feeding and nesting (terrains, areas) of representatives and couples of the species). Due to this circumstance the implementation of the IP will not affect the condition of the Lesser Grey Shrike in this part of the country, in the IP area and in the PA, as the potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly, neither indirectly in a significant degree the closest habitats of the species in the PA, as the existing numerous places suitable for feeding and nesting of representatives of the species will continue to provide the necessary resources for the nesting complex of the species there which corresponds to the purposes and subject of and subject of PA "Zlatiyata".

- Barred Warbler (*Sylvia nisoria*). Nesting migrant and passing species. Found in many areas in large part of the country, but more around the Black Sea coast, the Eastern Rhodopes, the central Danube plain and areas of Dobrudzha, Sofiisko field and mountains around it, in all mountains at an altitude up to 1000 m and even up to 1300-1400 m, in the valleys of the Struma and Mesta rivers and other parts of the country. Inhabits shrub and bush covered territories, forests, river banks, open territories with clusters and strips of trees and shrub and their mosaic formations among grasslands. It builds its nests in the low parts of shrubs and small trees. The spring migration is in April and the autumn – in August and September. **The Standard Data form states that the number of the species in the PA consists of 59 (11-108) nesting couples and 10 resting representatives during migrations.** This number compared to the number of the species in the country is evaluated as (B) – 15%  $\geq p > 2\%$ . The degree of isolation of the nesting couples of the species is evaluated as (C) – non-isolated within extended distribution range. The global assessment of the possibilities for conservation of the species in the PA is (B) – good value.

Suitable habitats for the species in the search of food and resting places in the area of the IP are shrubs and low trees in the outskirts of the forest territory inside of which the Radiana site is located. Due to the dense coverage of trees and shrubs it is not part of neither the trophic nor nesting base of the species in the area since its representatives avoid dense forest areas. No representatives have been registered near the forest area but it is possible some are found mainly during seasonal migrations. Due to this a certain increase of the disruption during the construction and operation of the site might be possible resulting from the additional anthropogenic pressure in the area but outside the range of the PA itself. On the territory of the PA itself there are numerous places suitable for feeding and nesting (terrains, areas) of representatives and couples of the species. Due to this circumstance the implementation of the IP will not affect the condition of this species in this part of the country and the area of the IP in a sensitive aspect. The potential local impacts on the environment during the construction and operation of the IP (noise, dust pollution, temporary radiation emissions resulting from accidents with RCC of RAW, etc.) cannot impact directly neither indirectly in any significant extent the closest habitats of the species in the PA, as the existing numerous places suitable for feeding and nesting of representatives of the species will continue to provide the necessary resources for the nesting complex of the species there which corresponds to the purposes and subject of PA „Zlatiyata”.

IV.5.2.2 Species subject to conservation in the PA BG0000533 "Kozloduy Islands" and included in Annex II of Directive 92/43/EEC.

✓ Mammals included in Annex II of Directive 92/43/EEC.

- 1355 European Otter (*Lutra lutra*, Linnaeus, 1758). The habitats of the species are connected to various water bodies. It prefers water bodies fringed with thick vegetation or with rocky banks difficult to access. It is active during the night but in places hardly accessible to men also during the day. Feeds on fish, voles, frogs and crabs. Inhabits natural river courses and enclosed water bodies with length of at least 15–20 km: with former riverbeds and riparian vegetation – longose groves, alder groves and reeds (low banks), diverse ichthyofauna and a minimum mass of 40 kg/ha, abundance of crabs, frogs, fish, vertebrates, mollusca (Spasov, Ivanov, unpubl.).

Information for the nature conservation status of the species is given in the table below.

Table No 4.5.2-1

Species	BDA	Bern Convention	Dir.92/43 /EEC	IUCN Red List (2014)
European Otter ( <i>Lutra lutra</i> )	Annex 2,3	+ (II)	+ (II, IV)	+ (NT)
<b>Key:</b> + Listed NT ( "near threatened" species ) V ( "vulnerable" species ) - Unlisted LC ( "least concern" species )				

The Standard Data Form of the protected area states that the protected area is inhabited by 3 – 4 representatives. The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C) 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (I. Petrov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Favourable. The length of the river sections suitable for habitation by the European Otter is 30.04 km, and the area of water bodies and their banks suitable for habitation by the European Otter is 827.92 ha.

Based on the collected data the following amendment of the Standard Data Form has been proposed - the value of the criterion „Size” (the number of representatives was increased to 9) due to the bigger number of the European Otter in this area. No values of other criteria in the standard form have been amended.

The IP area is not a habitat of the species.

✓ Herpetofauna listed in Annex II to Directive 92/43/EEC.

AMPHIBIANS.



- 1188. Fire-bellied toad (*Bombina bombina*). Inhabits gullies with slow flowing water, ditches, etc. It spawns single eggs or small clusters on underground objects. Feeds on insects, their larvae and crustaceans.

Information for the nature conservation status of the species is given in the table below.

Table No 4.5.2-2

Species	BDA	Bern Convention	Dir.92/43 /EEC	IUCN Red List (2014)
Fire-bellied toad ( <i>Bombina bombina</i> )	Annex 2,3	+ (II)	+ (II, IV)	+ (LC)
<b>Key:</b> + Listed NT ( "near threatened" species ) V ( "vulnerable" species ) - Unlisted LC ( "least concern" species )				

The Standard Data Form states that there are no number data on the population and the species is marked as present (P). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (D) non-significant population.

According to current data (N. Tsankov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition.

The IP area is not a habitat of the species.

- 1993 Danube crested newt (*Triturus dobrogicus*). Found only near the Danube. Inhabits standing water bodies, canals with slow flowing water and their vicinity. Found also in marshlands, the mouths of the Danube tributaries and on the islands in the river. Information for the nature conservation status of the species is given in the table below.

Table No 4.5.2-3

Species	BDA (Annex2,3)	Bern Convention	Dir.92/43/E EC	IUCN Red List (2014)
Danube crested newt ( <i>Triturus dobrogicus</i> )	Annex 2,3	+ (II)	+ (II)	+ (NT)
Key: + Listed NT ( "near threatened" species ) - Unlisted LC ( "least concern" species )				

The Standard Data Form states that there are no number data on the population and the species is marked as present (P). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (D) non-significant population.

According to current data (B. Naumov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. **No representatives of the species were found in the area.**

## REPTILES.

- 1220. European pond terrapin (*Emys orbicularis*). In most areas of its typical habitats the European pond terrapin can be found in various slow flowing waters or marshlands some of which can completely dry up in the summer. Typical examples are draining channels, fisheries, marshes, small lakes, rivers and streams, brackish waters of estuaries, coastal water bodies. The presence of abundant water vegetation is typical for the habitats. The newly

Species	BDA (Annex2,3)	Bern Convention	Dir.92/43/EEC	IUCN Red List (2014)
European pond terrapin ( <i>Emys orbicularis</i> )	Annex 2,3	+ (II)	+ (II, IV)	+ (NT)
<b>Key:</b> + Listed NT ( "near threatened" species ) - Unlisted LC ( "least concern" species )				

According to current data (N. Tsankov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition.

✓ Ichthyofauna listed in Annex II to Directive 92/43/EEC.

*Table No 4.5.2-5.*

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*Assessment of the degree of impact on Protected Areas under Nature 2000 and IP for “Construction of National Disposal Facility for low and intermediate level radioactive waste - NDF” on “Radiana” site in the land of the village of Hurlets, Kozloduy municipality.*

- 4125 Black sea shad (*Alosa pontica*). The species is transitory and comes to breed in the Danube River every year in May, swimming in large shoals in the top water layers.

The Standard Data Form states that there are no number data on the migratory (for breeding) population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (B) good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy). The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (B) good value.

According to current data (G. Raykova), published on the website of Natura 2000 (<http://natura2000.moew.government.bg/>), based on the latest performed surveys of the protected areas, the total area of the potential habitats is 516,685 ha. The overall evaluation of the area under all criteria of the BBF for the habitat type is: Favourable condition.

The IP area is not a habitat of the species.

- 1130. Aral asp (*Aspius aspius*). The species inhabits the Danube permanently. It inhabits the lower courses of constant rivers but is found also in estuary water. It spawns on rocky substrates and in quick flowing waters with temperature 9–10 °C.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

According to current data (Ap. Apostolou), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition.

- The IP area is not a habitat of the species.

- 2533 Balkan Loach (*Cobitis elongata*). The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

According to current data (Y.Kutsarov), (<http://natura2000.moew.government.bg/>), in the protected area there are no habitats (middle courses of the large Danube tributaries with moderate and quick flowing water and depth up to 2 m) suitable for habitation by of the species. Due to this reason the species should be excluded from further mapping in the area and removed from the standard data form.

The IP area is not a habitat of the species.

- 1149. Spined loach (*Cobitis elongatoides* = *Cobitis taenia*). Inhabits the coastal zone of the Danube.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

According to current data (Ap.Apostolou), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. The only observed and described difference concerns the abundance of the species population in the area – the category in the standard data form is amended from R (rare) to P (present population).

The IP area is not a habitat of the species.

- 2484 Ukrainian brook lamprey (*Eudontomyzon mariae*) In the last 20 years the species was found only once near the town of Tutrakan.

The Standard Data Form of the protected area states that there is no number data for the population and the species was marked as very rare (V). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (A) (almost) isolated population;. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (T. Stefanov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. Not found during the field surveys in the area. Nevertheless the probability to be found in a limited water area still exists but is very small. In the old standard form the population size was marked as C, which does not reflect the present state and has been amended to D (non-significant population).

The IP area is not a habitat of the species.

- 1124 White-finned gudgeon (*Gobio albipinnatus*) – Found in the Danube River and the lower course of some tributaries.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

According to current data (T. Stefanov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. Not found during the field surveys in the area. Nevertheless the probability to be found in the area still exists but is very small. Due to this the category was amended from C (typical) to V (very rare). In the old standard form the population size was marked as C, which does not reflect the present state and has been amended to D (non-significant population).

The IP area is not a habitat of the species.

– 2555 Balon's Ruffe (*Gymnocephalus baloni*).

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

According to current data (Y. Kutsarov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. Due to the impossibility to register the species during the mapping, the category in the standard data form was amended from R (rare) to P (present population).

The IP area is not a habitat of the species.

– 1157 Striped Ruffe (*Gymnocephalus schraetzer*) Found in permanent large rivers. Inhabits deep rivers with sandy-gravelly bottoms.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

According to current data (Y. Kutsarov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is:



Unfavourable - unsatisfactory condition. Due to the impossibility to register the species during the mapping, the category in the standard data form was amended from C (typical) to P (present population).

- The IP area is not a habitat of the species.

- 1145. Mud loach (*Misgurnus fossilis*). Inhabits permanent rivers and permanent fresh water lakes and marshes, standing and slow flowing waters, with sandy or gravelly bottoms. The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value; the species is listed in the Standard Data form of the area but was not registered during the performed field surveys.

The IP area is not a habitat of the species.

- 2522 Knife (*Pelecus cultratus*). Inhabits the low courses of larger rivers, large lakes and estuary waters.

The Standard Data Form of the protected area states that there is no number data for the population and the species was marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

According to current data (St. Mihov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. The species was not registered during the performed field surveys in the area. It is probably very rare or not found in it. Unsatisfactory - unfavourable condition. Its evaluation was amended to P - presented. Its population was amended to D – non-significant.

The IP area is not a habitat of the species.

- 1134. European bitterling (*Rhodeus amarus*). Inhabits the coastal zone in the Danube and permanent water bodies on the territory of the protected area, where conditions fully match the habitat requirements of the species.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as

(C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

According to current data (St. Mihov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: the species population within the area is in favourable condition. Found everywhere in the slower river section in numbers 753 ind./ha.

– The IP area is not a habitat of the species.

– 1146 Goldside Loach (*Sabanejewia aurata*). Inhabits the mid and upper courses of permanent rivers with sandy-gravelly bottoms and quick flowing waters.

The Standard Data Form states that there are no number data on the population and the species is marked as present (P). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (D) non-significant population.

The IP area is not a habitat of the species.

– 1160 Streber (*Zingel streber*). The Standard Data Form states that there are no number data on the population and the species is marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

According to current data (Ap. Apostolou), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. Based on the collected data the following amendment of the Standard Data Form has been proposed – the category in the standard form is amended from rare (R) to P (present population). The size and density of the species population, compared to the populations on the entire territory of the country from (B)  $15\% \geq p > 2\%$  to (C)  $2\% \geq p > 0\%$ .

The IP area is not a habitat of the species.

– 1159 Zingel (*Zingel zingel*). Found only in permanent large rivers.

The Standard Data Form states that there are no number data on the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation

of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

According to current data (Ap. Apostolou), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. Based on the collected data the following amendment of the Standard Data Form has been proposed - the category in the standard form is amended from typical (C) to P (present population) and the size and density of the species population, compared to the populations on the entire territory of the country from (B) 15%  $\geq p > 2\%$  to (C)  $2\% \geq p > 0\%$ .

- The IP area is not a habitat of the species.

✓ Invertebrates included in Annex II of Directive 92/43/EEC.

Information for the nature conservation status of the species of INVERTEBRATES subject to conservation in the protected areas is presented in the table below.

Table No 4.5.2-6

Species	BDA (Annex2,3)	Bern Convention	Dir.92/43/E EC	IUCN Red List (2014)
Thick shelled river mussel ( <i>Unio crassus</i> )	Annex 2, 3	-	+(II, IV)	+ (3)
Stag Beetle ( <i>Lucanus cervus</i> )	Annex 2, 3	+(III)	+(II)	-
<b>Key:</b> + Listed                      NT ( "near threatened" species ) - Unlisted                    EN ( "endangered" species ) DD ( "data deficient" )				

- 1032 Thick shelled river mussel (*Unio crassus*) - Inhabits the clear running rich in oxygen water zone of rivers and streams with riverbeds covered with small gravel or sand. This species is very sensitive to eutrophication.

The Standard Data Form of the protected area states that there is no number data for the population and the species was marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

According to current data (M. Todorov), published on the Natura 2000 website (<http://natura2000.moew.government.bg/>), based on the latest performed surveys of the protected areas, the area of the effectively occupied habitats of the species where it was found during the period of the survey is 34.09 ha. The total area of potential habitats is 66.48 ha. The overall evaluation of the area under all criteria of the BBF for the habitat type is: Favourable condition.

- The IP area is not a habitat of the species.

- 1083 Stag Beetle (*Lucanus cervus*). The life cycle of the species is connected to old oak forests. The female lays its eggs in **old oak stumps**. The larvae feed on half-rotten wood.

✓ *Mammals included in Annex II of Directive 92/43/EEC.*

*Table No 4.5.2-7.*

Species	BDA (Annex2,3)	Bern Convention	Dir.92/4 3/EEC	IUCN Red List (2014)
European Otter ( <i>Lutra lutra</i> )	Annex 2,3	+ (II)	+(II, IV)	+ (NT)
Romanian Hamster ( <i>Mesocricetus newtoni</i> )	Annex 2,3	+ (II)	+(II, IV)	+ (NT)
European souslik ( <i>Spermophilus citellus</i> )	Annex 2	+ (II)	+(II, IV)	+ (V)
<b>Key:</b> + Listed                      NT ( "near threatened" species ) V ( "vulnerable" species ) - Unlisted                      LC ( "least concern" species )				

- The Standard Data Form of the protected area states that the protected area is inhabited by 2 – 3 representatives. The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;
- According to current data (I. Petrov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Favourable. The

length of the river sections suitable for habitation by the European Otter is 30.77 km, and the area of their banks is 588.82 ha. Based on the collected data the following amendment of the Standard Data Form has been proposed - the value of the criterion „Size” (the number of representatives was increased to 4 – 5) due to the bigger number of the European Otter in this area. No values of other criteria in the standard form have been amended.

The IP area is not a habitat of the species.

- 2609. Romanian Hamster (*Mesocricetus newtoni*, *Linnaeus*, 1766). In Bulgaria the species is found in Dobrudzha, the central and eastern parts of the Danube plain to the west up to the Ogosta River. Found in isolated sites south of Stara planina (“Mammals in Bulgaria”). Inhabits agricultural areas in the lowlands and plains with prevailing perennial grass crops on fertile soils as its number in agricultural areas is higher compared to this in wild grass areas.

The Standard Data Form of the protected area states that there is no number data for the population and the species was marked as very rare (V). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (B) good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy). The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (C) significant value.

According to current data (Y. Koshev), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. During the field survey the species has not been found within the protected area, though there are potential habitats with the necessary resources and the most western site of the species was registered exactly at the left bank of the Ogosta River. That is the reason its presence in the area cannot be excluded.

The IP area is not a habitat of the species.

- 1335. European souslik (*Spermophilus citellus*, *Linnaeus*, 1766). Inhabits open arable lands covered with low grass vegetation (meadows, pastures, dry steppes, the outskirts of arable fields, road shoulders, etc.). Prefers Chernozems, Chromic Cambisols and Umbrosols, etc.

The specie inhabits non-arable lands (virgin soils, pastures, meadows, etc.) covered with short grass vegetation on uniform, low compacted, water pervious soils. Does not inhabit arable lands though it enters them in search of food (Stefanov, 2006).

The Standard Data Form of the protected area states that there is no number data for the population and the species was marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (B) good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy). The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (Y. Koshev), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable -



- AMPHIBIANS.

Table No 4.5.2-8

Species	BDA (Annex2,3)	Bern Convention	Dir.92/43/E EC	IUCN Red List (2014)
Fire-bellied toad ( <i>Bombina bombina</i> )	Annex 2,3	+ (II)	+(II,IV)	+ (LC)
Yellow-bellied toad ( <i>Bombina variegata</i> )	Annex 2,3	+ (II)	+(II,IV)	+ (LC)
Southern crested newt ( <i>Triturus karelinii</i> )	Annex 2,3	+ (II)	+(II,IV)	+ (LC)
Danube crested newt ( <i>Triturus dobrogicus</i> )	Annex 2,3	+ (II)	+(II)	+ (NT)
<b>Key:</b> + Listed NT ( "near threatened" species ) - Unlisted LC ( "least concern" species )				

- 1188. Fire-bellied toad (*Bombina bombina*). Inhabits gullies with slow flowing water, ditches, etc. It spawns single eggs or small clusters on underground objects. Feeds on insects, their larvae and crustaceans.

The Standard Data Form states that there are no number data on the population and the species is marked as present (P). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (B) non-isolated population, but on margins of area of distribution;. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (A. Stoyanov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition.

The IP area is not a habitat of the species.

- 1171 Southern crested newt (*Triturus karelinii*) – the species is widely distributed in the low and middle mountain areas of the country, as well as along the Black Sea coast. In the Thracian lowland and the Danube plain have been found only single sites (not established for certain in the western part of the Danube plain). Inhabits various water bodies with standing water – marshes, lakes, big puddles, etc. and their banks (in the dry land stage).

The Standard Data Form states that there are no number data on the population and the species is marked as present t(P). The size and density of the species population, compared to

the populations on the entire territory of the country is evaluated as (D) non-significant population.

According to current data (A. Stoyanov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. No representatives of the species were found in the area.

The IP area is not a habitat of the species.

- 1193 Yellow-bellied toad (*Bombina variegata*) – The species is widely distributed in the low and middle mountain areas of the country. Not found in the eastern parts of Stara planina, Strandzha, the Thracian lowland and the Black sea coast. In the Danube plain are found only several isolated sites most of which have not been confirmed in the last 50 years.

The Standard Data Form states that there are no number data on the population and the species is marked as present (P). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (B) non-isolated population, but on margins of area of distribution;. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (A. Stoyanov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. No representatives of the species were found in the area. Almost complete (99%) lack of suitable habitats.

The IP area is not a habitat of the species.

- 1993 Danube crested newt (*Triturus dobrogicus*) - Found only near the Danube. Inhabits standing water bodies, canals with slow flowing water and their vicinity. Found also in marshlands, the mouths of the Danube tributaries and on the islands in the river.

The Standard Data Form states that there are no number data on the population and the species is marked as present (P). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (B) non-isolated population, but on margins of area of distribution;. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (B. Naumov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. No representatives of the species were found in the area.

The IP area is not a habitat of the species.

## REPTILES.

Information for the nature conservation status of the species of reptiles subject to conservation in the protected area is given in the table below.

*Table No 4.5.2-9.*

Species	BDA (Annex 2,3)	Bern Convention	Dir.92/43/EEC	IUCN Red List (2014)
European pond terrapin ( <i>Emys orbicularis</i> )	Annex 2,3	+ (II)	+(II,IV)	+ (NT)
Hermann's tortoise ( <i>Testudo hermanni</i> ).	Annex 2,3	+ (II)	+(II,IV)	+ (NT)
Blotched snake ( <i>Elaphe sauromates</i> )	Annex 2,3	-	-	-
<b>Key:</b> + Listed                      NT ( "near threatened" species ) - Unlisted                      LC ( "least concern" species )				

- Blotched snake (*Elaphe sauromates*). Inhabits mainly areas with sparse woods and shrubs or steppe vegetation where it prefers furrows, gullies, etc. Also enters the outskirts of marshes in search of bird nests.

The Standard Data Form states that there are no number data on the population and the species is marked as present (P). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (B) good value.

According to current data (A. Stoyanov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. No representatives of the species were found in the area.

The IP area is not a habitat of the species.

- 1220. European pond terrapin (*Emys orbicularis*). In most areas of its typical habitats the European pond terrapin can be found in various slow flowing waters or marshlands some of which can completely dry up in the summer. Typical examples are draining channels, fisheries, marshes, small lakes, rivers and streams, brackish waters of estuaries, coastal water bodies. The presence of abundant water vegetation is typical for the habitats. The newly hatched terrapins prefer the shallow waters with no more than half a meter depth.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (A. Stoyanov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Favourable.

The IP area is not a habitat of the species.



(B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

The species is rare for the Ogosta River. It is found more often in the river mouth and during breeding migrations. According to current data (Ap. Apostolou, Lot 2: Mapping and determining the nature conservation condition of fish), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition.

The IP area is not a habitat of the species.

- 1138 Mediterranean barbel (*Barbus meridionalis*) - Shoal species which inhabits the upper and mid river courses along the slopes of Stara planina and the Fore Balkan.

The Standard Data Form states that there are no number data on the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (B) good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy). The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (B) good value.

Though the species is severely diminished after the Ogosta dam was built it is still found almost in the entire river below the dam.

According to current data (M. Vasilev, OP 2: Mapping and determining the nature conservation status of fish), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition.

The IP area is not a habitat of the species.

- 2533 Balkan Loach (*Cobitis elongata*)

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (Y. Kutsarov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. During the field surveys in the area the numbers established were 613 ind./ha. Registered in the southern part of the protected area. An amendment of the standard data form was proposed - the size and density of the species population from (B)  $15\% \geq p > 2\%$ . to (C)  $2\% \geq p > 0\%$ .



The IP area is not a habitat of the species.

- 1149. Spined loach (*Cobitis elongatoides* = *Cobitis taenia*). Inhabits the coastal zone of the Danube, found also in standing waters and canals on the territory of the protected area, but is presented in these water bodies by fragmented population of very low numbers.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (Ap. Apostolou), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Favourable condition. An abundant species in the area. Found everywhere in the slower sections of the river in numbers of 1898 ind./ha.

The IP area is not a habitat of the species.

- 2484 Ukrainian brook lamprey (*Eudontomyzon mariae*) In the last 20 years the species was found only once near the town of Tutrakan.

The Standard Data Form of the protected area states that there is no number data for the population and the species was marked as very rare (V). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (D) non-significant population.

According to current data (T. Stefanov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. Not found during the field surveys in the area.

The IP area is not a habitat of the species.

- 1124 White-finned gudgeon (*Gobio albipinnatus*) - Found in the Danube River and the lower course of some tributaries.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (T. Stefanov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. Not found during the field surveys in the area.

The IP area is not a habitat of the species.

- 2555 Balon's Ruffe (*Gymnocephalus baloni*).

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (Y. Kutsarov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. Due to the impossibility to register the species during the mapping, the category in the standard data form was amended from R (rare) to P (present population).

The IP area is not a habitat of the species.

- 1157 Striped Ruffe (*Gymnocephalus schraetzer*) Found in permanent large rivers. Inhabits deep rivers with sandy-gravelly bottoms.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (Y. Kutsarov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. Due to the impossibility to register the species during the mapping, the category in the standard data form was amended from C (typical) to P (present population).

The IP area is not a habitat of the species.

- 1145. Mud loach (*Misgurnus fossilis*). Inhabits permanent rivers and permanent fresh water lakes and marshes, standing and slow flowing waters, with sandy or silty bottoms.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (M. Vasilev), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable -

unsatisfactory condition. The category in the standard data form was amended from C (typical) to P (present population). The size and density of the species population, compared to the populations on the entire territory of the country from (B) 15%  $\geq p > 2\%$  to (C) 2%  $\geq p > 0\%$  and the degree of conservation of the features of the habitat important for the species and the restoration possibility from (A) excellent conservation to (B) good conservation.

The IP area is not a habitat of the species.

- 2522 Knife (*Pelecus cultratus*). Inhabits the low courses of larger rivers, large lakes and estuary waters.

The Standard Data Form states that there are no number data on for the population and the species was marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C) 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (B) good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy). The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (B) good value.

According to current data (St. Mihov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. The species was not registered during the performed field surveys in the area.

The IP area is not a habitat of the species.

- 1134. European bitterling (*Rhodeus amarus*). Inhabits the coastal zone in the Danube and permanent water bodies on the territory of the protected area, where conditions fully match the habitat requirements of the species.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C) 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

According to current data (St. Mihov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: the species population within the area is in favourable condition. Found everywhere in the slower river section in numbers 509 ind./ha.

The IP area is not a habitat of the species.

- 1146 Goldside Loach (*Sabanejewia aurata*). Inhabits the mid and upper courses of permanent rivers with sandy-gravelly bottoms and quick flowing waters.

The Standard Data Form states that there are no number data on the population and the species is marked as present (P). The size and density of the species population, compared to

the populations on the entire territory of the country is evaluated as (D) non-significant population.

According to current data (Y. Kutsarov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. Found only in river sections with quick flowing water in numbers of 80 ind./ha. Based on the collected data the following amendment of the Standard Data Form has been proposed – the species is typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

The IP area is not a habitat of the species.

- 1160 Streber (*Zingel streber*). The Standard Data Form states that there are no number data on the population and the species is marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (Ap. Apostolou), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. Based on the collected data the following amendment of the Standard Data Form has been proposed - the category in the standard form is amended from rare (R) to P (present population), the size and density of the species population, compared to the populations on the entire territory of the country from (B)  $15\% \geq p > 2\%$  to (C)  $2\% \geq p > 0\%$  and the degree of conservation of the features of the habitat important for the species and the restoration possibility from (A) excellent conservation to (B) good conservation.

The IP area is not a habitat of the species.

- 1159 Zingel (*Zingel zingel*) - Found only in permanent large rivers.

The Standard Data Form states that there are no number data on the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (Ap. Apostolou), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. Based on the collected data the following amendment of the Standard Data Form has been proposed - the category in the standard form is amended from typical (C) to P (present population) and the size and density of the species population, compared to the populations on the entire territory of the country from (B) 15%  $\geq p > 2\%$  to (C)  $2\% \geq p > 0\%$ .

The IP area is not a habitat of the species.

✓ Invertebrates included in Annex II of Directive 92/43/EEC.

Information for the nature conservation status of the species of INVERTEBRATES subject to conservation in the protected areas is presented in the table below.

Table No 4.5.2-11

Species	BDA (Annex2,3)	Bern Convention	Dir.92/43/E EC	IUCN Red List (2014)
Thick shelled river mussel ( <i>Unio crassus</i> )	Annex 2, 3	-	+(II, IV)	+ (3)
Bolbelasmus unicornis ( <i>Bolbelasmus unicornis</i> )	Annex2	-	-	-
Stag Beetle ( <i>Lucanus cervus</i> )	Annex 2, 3	+(III)	+(II)	-
Morimus funereus ( <i>Morimus funereus</i> )	Annex 2	-	+(II)	+ (V)
Rosalia longicorn ( <i>Rosalia alpina</i> )	Annex 2,3	+(II)	+(II,IV)	+ (V)
Striped nerite ( <i>Theodoxus transversalis</i> )	Annex 2,3	-	+(II,IV)	+ (3)
<b>Key:</b> + Listed                      V ( "vulnerable" species ) - Unlisted                    EN ( "endangered" species )				

- 1032 Thick shelled river mussel (*Unio crassus*). Inhabits the clear running rich in oxygen water zone of rivers and streams with riverbeds covered with small gravel or sand. This species is very sensitive to eutrophication.

In the Standard Data form the species was marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (B) good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy). The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (B) good value.

According to current data (project for "Mapping and determining the nature conservation status of natural habitats and species", M. Todorov), published on the Natura 2000 website (<http://natura2000.moew.government.bg/>), based on the latest performed surveys of the protected areas, the area of the effectively occupied habitats of the species where it was found during the period of the survey is 10.80 ha., - the villages of Glozhene and Harlets. The total area of potential habitats is 46.50 ha. and it covers the entire river course in the protected area.

The overall evaluation of the area under all criteria of the BBF for the habitat type (according to the survey) is: Unfavourable - unsatisfactory condition.

- The IP area is not a habitat of the species.



- 4011 *Bolbelasmus unicornis* (*Bolbelasmus unicornis*). A rare species whose populations everywhere in its habitats are undergoing diminishing and fragmentation. Its distribution is connected mostly with the presence of old broad-leaved forests with available rotting trees.

In the Standard Data form the species is marked as very rare (V). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0$ ; The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (B) good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy). The degree of isolation of the population compared to the natural degree for the species is evaluated as (B) non-isolated population, but on margins of area of distribution; the global assessment of the value of the site for the conservation is evaluated as (B) good value.

According to current data (B. Georgiev and R. Bekchiev (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. During the field survey no suitable habitats for the development of the species were established. The total area of the potential habitats in the area does not exceed 21.61 ha. These are overly fragmented and in the process of advanced degradation since they are surrounded by agricultural lands and other territories under anthropogenic influence. No old trees are found. The present conditions in the region have changed completely since the species was first found on the region of Oryahovo (Kovachev 1905). As a result of the survey a proposal was made for **the exclusion of the species from the Standard Data Form of the protected area.**

The IP area is not a habitat of the species.

- 1083 Stag Beetle (*Lucanus cervus*). The life cycle of the species is connected to old oak forests. The female lays its eggs in **old oak stumps**. The larvae feed on half-rotten wood.

The Standard Data Form of the protected area states that there is no number data for the population and the species was marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (D) non-significant population.

According to current data (B. Georgiev and R. Bekchiev), (<http://natura2000.moew.government.bg/>), during the field survey no sufficient in quality and quantity broad-leaved habitats were established. These are severely fragmented, surrounded by agricultural lands and anthropogenic territories and in the process of degradation. The number of old trees in these habitats is insufficient and the quantity of rotting wood is rather scarce. The overall evaluation of the area under all criteria of the BBF for the habitat type (and pursuant to the field survey) is Unfavourable - unsatisfactory condition. An amendment to the Standard Form was proposed – from rare (R) to present (P).

The IP area is not a habitat of the species.

- 1089 *Morimus funereus* (*Morimus asper funereus*) - inhabits mesophytic deciduous and mixed forest from 20 to 1600 m alt. The larvae develop in dead wood of broad-leaved trees – mainly beech.

In the Standard Data Form of the protected area the species was marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (D) non-significant population.

According to current data (B. Georgiev and R. Bekchiev), (<http://natura2000.moew.government.bg/>), no suitable habitats for the development of the species were established during the field survey. The deciduous forests in the area are of island type. These are overly fragmented and in the process of advanced degradation since they are surrounded by agricultural lands and other territories under anthropogenic influence. The overall tree age is not old; there are no old trees which is the reason for the lack of rotting wood necessary for the development of the larvae. The overall evaluation of the area under all criteria of the BBF for the habitat type (and pursuant to the field survey) is: Unfavourable - unsatisfactory condition. An amendment to the Standard Form was proposed – from rare (R) to present (P).

The IP area is not a habitat of the species.

- 1087. *Rosalia longicorn* (*Rosalia alpine*). Rare species inhabiting **old beech plantations at an altitude of 500 – 1000 m**. Its larvae are **exclusively connected to these forests**.

The species is found mostly in mountain beech woods where the tree crowns are relatively open and allow the sunlight to pass through. Its presence is an indicator that the wood is conserved in a good condition since this species can only survive on territories with old, dead and dying trees.

In the Standard Data Form of the protected area the species was marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (D) non-significant population.

According to current data (B. Georgiev and R. Bekchiev), (<http://natura2000.moew.government.bg/>), no suitable habitats for the development of the species were established during the field survey. Most of the deciduous forests in the area are riparian flood forests which excludes suitable habitats for the species. The main reason due to which the protected area is unsuitable for being inhabited by the *Rosalia alpine*, is the lack of any trophic base whatsoever for the larvae. The main food source of the larvae – the common beech is not available nor are any other potential host plants. As a result from the survey **a proposal to exclude the species from the standard form of the protected area was made.**

The IP area is not a habitat of the species. There are no old beech woods, no conditions for the development of the larvae of this species.

- 4064 Striped nerite (*Theodoxus transversalis*) – prefers hard substrates – rocky bottoms, less often small gravel, waters with high oxygen content (5.5-9.5 mg/l), slower courses (0.29-1.01 m/s), water temperature of 9-22°C and pH 7.5-8.3 (Angelov 2000). The species is sensitive to pollution/

In the Standard Data Form of the protected area the species was marked as very rare (V). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (M. Todorov), (<http://natura2000.moew.government.bg/>), in the period 2011-2012 no georeferenced sites were established. The nature conservation status of the species is unfavourable – unsatisfactory. Though the species has not been established

during the field surveys, its potential habitats in the area are 44.88 ha and cover the entire course of the river in it except a short section in the village of Harlets. The overall evaluation of the area under all criteria of the BBF for the habitat type: Unfavourable - unsatisfactory condition.

The IP area is not a habitat of the species.

#### IV.5.2.4 Species subject to conservation in the PA BG0000508 "Skat River" and included in Annex II of Directive 92/43/EEC.

✓ Mammals included in Annex II of Directive 92/43/EEC.

Information for the nature conservation status of the species of mammals subject to conservation in the protected area is given in the table below.

Table No 4.5.2-12

Species	BDA (Annex2,3)	Bern Convention	Dir.92/4 3/EEC	IUCN Red List (2014)
European Otter ( <i>Lutra lutra</i> )	Annex 2,3	+ (II)	+(II, IV)	+ (NT)
Romanian Hamster ( <i>Mesocricetus newtoni</i> )	Annex 2,3	+ (II)	+(II, IV)	+ (NT)
Long-fingered bat ( <i>Myotis capaccinii</i> ,)	Annex 2,3	+ (II)	+(II, IV)	+ (V)
<b>Key:</b> + Listed NT ( "near threatened" species ) V ( "vulnerable" species ) - Unlisted LC ( "least concern" species )				

- 1355 European Otter (*Lutra lutra* , Linnaeus, 1758). The habitats of the species are connected to various water bodies. It prefers water bodies fringed with thick vegetation or with rocky banks difficult to access. It is active during the night but in places hardly accessible to men also during the day. Feeds on fish, voles, frogs and crabs.

The Standard Data Form of the protected area states that the protected area is inhabited by 0 – 1 the representative. The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C) 2%  $\geq$  p > 0%. The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (C) average or reduced conservation; The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (C) significant value.

According to current data (I. Petrov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. The length of the river sections suitable for habitation by the European Otter is 56.84 km, and the area of their banks is 260.57 ha.

The evaluation of the criterion Size and density of the population of the species, compared to the populations on the entire territory of the country has been amended from (C) 2%  $\geq$  p > 0% to (D) non-significant population due to the very low number of the European Otter in this area.

The IP area is not a habitat of the species.

- 2609. Romanian Hamster (*Mesocricetus newtoni*, Linnaeus, 1766). In Bulgaria the species is found in Dobrudzha, the central and eastern parts of the Danube plain to the west up to the

Ogosta River. Found in isolated sites south of Stara planina ("Mammals in Bulgaria"). Inhabits agricultural areas in the lowlands and plains with prevailing perennial grass crops on fertile soils as its number in agricultural areas is higher compared to this in wild grass areas.

The Standard Data Form of the protected area states that there is no number data for the population and the species was marked as very rare (V). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (B) good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy). The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (C) significant value.

- According to current data (Y. Koshev), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. During the field survey the species has not been found within the protected area, though there are potential habitats with the necessary resources and the most western site of the species is nearby. That is the reason its presence in the area cannot be excluded. Around the protected area there are a number of habitats for the species and they can serve as bio corridors for its distribution.

The IP area is not a habitat of the species.

- 1316. Long-fingered bat (*Myotis capaccinii*, Bonaparte, 1837). Inhabits karst areas often near forests in forest landscapes. Exclusively cave species – inhabits caves and underground galleries all year round. In most cases the summer shelters are small, dry and airy caves. The winter shelters are large water caves with high air humidity and temperature from 2 to 6 degrees. It migrates at relatively long distances between its summer and winter shelters. Hunts at night near rivers mainly insects caught above the water surface.

The Standard Data Form states that there are no number data on the population and the species is marked as present (P). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (D) non-significant population.

According to current data (B.Petrov, G.Terziyski (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: No sufficient data for a more accurate assessment of the condition of the species in the area and its condition needs further targeted surveys.

The IP area is not a habitat of the species.

- ✓ Herpetofauna listed in Annex II to Directive 92/43/EEC.

#### AMPHIBIANS.

Information for the nature conservation status of the species of amphibians subject to conservation in the protected area is given in the table below.

Table No 4.5.2-13

Species	BDA	Bern	Dir.92/43/E	IUCN Red
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	(Annex2,3)	Convention	EC	List (2014)
Fire-bellied toad ( <i>Bombina bombina</i> )	Annex 2,3	+ (II)	+(II,IV)	+ (LC)
Danube crested newt ( <i>Triturus dobrogicus</i> )	Annex 2,3	+ (II)	+(II)	+ (NT)
<b>Key:</b> + Listed NT ( "near threatened" species ) - Unlisted LC ( "least concern" species )				

- 1188. Fire-bellied toad (*Bombina bombina*). Inhabits gullies with slow flowing water, ditches, etc. It spawns single eggs or small clusters on underground objects. Feeds on insects, their larvae and crustaceans.

The Standard Data Form states that there are no number data on the population and the species is marked as present (P). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C) 2%  $\geq$  p > 0%. The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (B) non-isolated population, but on margins of area of distribution;. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (N. Tsankov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition.

The IP area is not a habitat of the species.

- 1993 Danube crested newt (*Triturus dobrogicus*). Found only near the Danube. Inhabits standing water bodies, canals with slow flowing water and their vicinity. Found also in marshlands, the mouths of the Danube tributaries and on the islands in the river.

The Standard Data Form states that there are no number data on the population and the species is marked as present (P). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C) 2%  $\geq$  p > 0%. The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (B) non-isolated population, but on margins of area of distribution;. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

According to current data (B. Naumov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. No representatives of the species were found in the area.

The IP area is not a habitat of the species.

### REPTILES.

Information for the nature conservation status of the species of reptiles subject to conservation in the protected area is given in the table below.

*Table No 4.5.2-14*

Species	BDA (Annex2,3)	Bern Convention	Dir.92/43/E EC	IUCN Red List (2014)
European pond terrapin ( <i>Emys orbicularis</i> )	Annex 2,3	+ (II)	+(II,IV)	+ (NT)



Hermann's tortoise ( <i>Testudo hermanni</i> ).	Annex 2,3	+ (II)	+(II,IV)	+ (NT)
Blotched snake ( <i>Elaphe sauromates</i> )	Annex 2,3	-	-	-
<b>Key:</b> + Listed                      NT ( "near threatened" species ) - Unlisted                    LC ( "least concern" species )				

- Blotched snake (*Elaphe sauromates*) - Inhabits mainly areas with sparse woods and shrubs or steppe vegetation where it prefers furrows, gullies, etc. Also enters the outskirts of marshes in search of bird nests.

The Standard Data Form states that there are no number data on the population and the species is marked as present (P). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (D) non-significant population.

According to current data (N. Tsankov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable – bad condition. No representatives of the species were found in the area.

The IP area is not a habitat of the species.

- 1220. European pond terrapin (*Emys orbicularis*). In most areas of its typical habitats the European pond terrapin can be found in various slow flowing waters or marshlands some of which can completely dry up in the summer. Typical examples are draining channels, fisheries, marshes, small lakes, rivers and streams, brackish waters of estuaries, coastal water bodies. The presence of abundant water vegetation is typical for the habitats. The newly hatched terrapins prefer the shallow waters with no more than half a meter depth.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C) 2%  $\geq$  p > 0%. The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (B) good value.

According to current data (N. Tsankov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Favourable.

The IP area is not a habitat of the species.

- 1217 Hermann's tortoise (*Testudo hermanni*) - The species is widely distributed in the country, but in many places its habitat is severely fragmented and the populations are small due to loss of habitats and people collecting the species. Inhabits deciduous forests, shrubs, pastures, etc.

The Standard Data Form states that there are no number data on the population and the species is marked as present (P). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C) 2%  $\geq$  p > 0%. The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-

Information for the nature conservation status of the species of fish subject to conservation in the protected area is given in the table below.

Species	BDA (Annex2,3)	Bern Convention	Dir.92/43/ EEC	IUCN Red List (2014)
Mediterranean barbel ( <i>Barbus meridionalis</i> )	Annex2	+(III)	+(II)	+(NT)
Spined loach ( <i>Cobitis taenia</i> )	Annex 2	+(III)	+(II)	+ (LC)
European bitterling ( <i>Rhodeus sericeus amarus</i> )	Annex 2	+(III)	+(II)	+ (LC)
Danube gudgeon ( <i>Gobio uranoscopus</i> )	Annex 2	+(III)	+(II)	+ (LC)
<b>Key:</b> + Listed NT ( "near threatened" species ) - Unlisted V ( "vulnerable" species ) LC ( "least concern" species )				

- The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C) 2%  $\geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (B) good conservation (elements well conserved independent of the grading of the possibility of restoration and elements in average or partially degraded condition and restoration easy). The degree of isolation of the population compared to the natural degree for the species is evaluated as (B) non-isolated population, but on margins of area of distribution. The global assessment of the value of the site for the conservation is evaluated as (B) good value.

According to current data (M. Vasilev), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Favourable condition. The following changes in the Standard Form were proposed:

The abundance category is amended from rare (R) to typical (C).

The conservation category is amended to (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration).

The global assessment category is amended to (A) excellent value.

– 1149. Spined loach (*Cobitis elongatoides* = *Cobitis taenia*). Inhabits the coastal zone of the Danube, found also in standing waters and canals on the territory of the protected area, but presented in these water bodies in fragmented population of very low numbers.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

According to current data (Ap. Apostolou), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Favourable condition.

The IP area is not a habitat of the species.

- 1122 Danube gudgeon (*Gobio uranoscopus*) – Found in the tributaries of the Danube. Adapted to living in upper river courses.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (C) average or reduced conservation; The degree of isolation of the population compared to the natural degree for the species is evaluated as (A) (almost) isolated population. The global assessment of the value of the site for the conservation is evaluated as (C) significant value.

According to current data (T. Stefanov), (<http://natura2000.moew.government.bg/>), the overall evaluation of the area under all criteria of the BBF for the habitat type is: Unfavourable - unsatisfactory condition. Not found during the field surveys in the area. Nevertheless a probability exists that it could be found in the area but it is very small. This is the reason of changing the category from R (rare) to V (very rare). In the old standard form the population size was marked as C which does not match the present condition and was amended to D (non-significant population).

The IP area is not a habitat of the species.

- 1134. European bitterling (*Rhodeus amarus*). Inhabits the coastal zone in the Danube and permanent water bodies on the territory of the protected area, where conditions fully match the habitat requirements of the species.

The Standard Data Form of the protected area states that there is no number data for the population and the species is marked as typical (C). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (B)  $15\% \geq p > 2\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value;

The IP area is not a habitat of the species.

- ✓ Invertebrates included in Annex II of Directive 92/43/EEC.

Information for the nature conservation status of the species of INVERTEBRATES subject to conservation in the protected areas is presented in the table below.

Table No 4.5.2-16

Species	BDA (Annex2,3)	Bern Convention	Dir.92/43/E EC	IUCN Red List (2014)
Thick shelled river mussel ( <i>Unio crassus</i> )	Annex 2, 3	-	+(II, IV)	+ (3)
Stag Beetle ( <i>Lucanus cervus</i> )	Annex 2, 3	+(III)	+(II)	-
Rosalia longicorn ( <i>Rosalia alpina</i> )	Annex 2,3	+(II)	+(II,IV)	+ (V)
<b>Key:</b> + Listed                      V ( "vulnerable" species ) - Unlisted                    3 ( "endangered" species )				

- 1032 Thick shelled river mussel (*Unio crassus*) - Inhabits the clear running rich in oxygen water zone of rivers and streams with riverbeds covered with small gravel or sand. This species is very sensitive to eutrophication.

B In the Standard Data form the species was marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (A) excellent conservation (elements in excellent condition independent of the grading of the possibility of restoration); The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (A) excellent value.

- According to current data (M. Todorov), (<http://natura2000.moew.government.bg/>), based on the latest performed surveys of the protected areas, the area of the effectively occupied habitats of the species where it was found during the period of the survey is 29.59 ha. The total area of potential habitats is 99.90 ha.

- The overall evaluation of the area under all criteria of the BBF for the habitat type: Unfavourable - unsatisfactory condition.

The IP area is not a habitat of the species.

- 1083 Stag Beetle (*Lucanus cervus*). The life cycle of the species is connected to old oak forests. The female lays its eggs in **old oak stumps**. The larvae feed on half-rotten wood a.

The Standard Data Form of the protected area states that there is no number data for the population and the species was marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (C) average or reduced conservation. The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (C) significant value.

According to current data (B. Georgiev and R. Bekchiev), (<http://natura2000.moew.government.bg/>), <http://natura2000.moew.government.bg/>), during the fuel survey no sufficient in quality and quantity broad-leaved habitats were established. These are severely fragmented, surrounded by agricultural lands and anthropogenic territories and in the process of degradation. The number of old trees in these habitats is insufficient and

the quantity of rotting wood is rather scarce. The overall evaluation of the area under all criteria of the BBF for the habitat type (and pursuant to the field survey) is: Unfavourable - unsatisfactory condition. An amendment to the Standard Form was proposed based on the new data obtained from the field surveys, an updated evaluation of the NCS and a new model of distribution of the species. The new information is the basis of a more reliable evaluation of the potential habitats of the species and the threats existing there. According to the data the share of the national population of the species in the area is close to "0". This is a sufficient motivation for changing the size of the population found in the protected area compared to the national population of the species to (D) non-significant population.

The IP area is not a habitat of the species.

- 1087. *Rosalia longicorn* (*Rosalia alpine*). Rare species inhabiting **old beech plantations at an altitude of 500 – 1000 m.** Its larvae are **exclusively connected to these forests.**

- The species is found mostly in mountain beech woods where the tree crowns are relatively open and allow the sunlight to pass through. Its presence is an indicator that the wood is conserved in a good condition since this species can only survive on territories with old, dead and dying trees.

The Standard Data Form of the protected area states that there is no number data for the population and the species was marked as rare (R). The size and density of the species population, compared to the populations on the entire territory of the country is evaluated as (C)  $2\% \geq p > 0\%$ . The degree of conservation of the features of the habitat important for the species and the restoration possibility is evaluated as (C) average or reduced conservation; The degree of isolation of the population compared to the natural degree for the species is evaluated as (C) non-isolated population within extended distribution range. The global assessment of the value of the site for the conservation is evaluated as (C) significant value.

According to current data (B. Georgiev and R. Bekchiev), (<http://natura2000.moew.government.bg/>), no suitable habitats for the development of the species were established during the field survey. Most of the deciduous forests in the area are riparian flood forests which excludes suitable habitats for the species. The main reason due to which the protected area is unsuitable for being inhabited by the *Rosalia alpine*, is the lack of any trophic base whatsoever for the larvae. The main food source of the larvae – the common beech is not available nor are any other potential host plants. As a result from the survey **a proposal to exclude the species from the standard form of the protected area was made.**

The IP area is not a habitat of the species. No conditions for the development of the larvae of this species.

## V. DESCRIPTION AND ANALYSIS OF THE PROBABILITY AND EXTENT OF THE IMPACT OF THE INVESTMENT PROPOSAL ON THE SUBJECT AND OBJECTIVES OF CONSERVATION IN THE PROTECTED AREAS.

For the assessment of the impact of the elements of the IP on the habitats and species subject to conservation in the PA BG0002009 „Zlatiyata”, PA BG0000533 „Kozloduy Islands”, PA BG0000614 „Ogosta River” and PA BG0000508 „Skat River“ was used a 10-level assessment scale which allows for taking into account the various parameters of significance of a given impact compared to the standard indicators for assessing the level of the impact. The levels of the scale used for the assessment are presented below in *Table No 5.1* and *Table No 5.2*.



Table No 5.1.

Impact level assessment matrix	
Level	Indicator
0	The activity has no impact.
1	The activity has insignificant to very low negative impact.
2	The activity can cause temporary negative impacts. This might include also impacts fully reversible immediately after their termination (i.e. air pollution by dust during the construction excavation works).
3	The activity can cause short-term negative impacts. This might include longer term impacts reversible after their termination (i.e. accidental release of RAW packs in the environment during transportation incidents and burying incidents, radiation pollution resulting from accidental temporary leaks in the infiltration control system and deep draining system).
4	The activity can cause secondary negative impacts. This might include medium term impacts for a period between 1 and 2 years which are within acceptable limits with the implementation of standard preventive measures. The impacts are reversible to a large extent without the implementation of special restoration actions.
5	The activity can cause cumulative negative impacts. This might include long-term impacts for a period over 2 years which after the implementation of additionally recommended preventive and mitigation measures are within acceptable limits. The impacts are partially reversible without the implementation of special restoration actions.
6	The activity can cause synergic impacts. This might include long-term impacts for a period over 2 years which after the implementation of additionally recommended preventive and mitigation measures are acceptable. The impacts are poorly reversible without the implementation of special restoration actions.
7	The activity can cause secondary, cumulative, synergic negative impacts. The impacts can be eliminated with the implementation of mitigation/compensation measures.
8	The activity can cause significant secondary, cumulative, synergic negative impacts. The impacts can be eliminated to a large extent with the implementation of mitigation/compensation measures.
9	The activity causes significant medium-term or long-term/permanent negative impacts. The impacts can be eliminated partially with the implementation of mitigation/compensation measures.
10	The activity causes significant and permanent/irreversible negative impact. The impact cannot be eliminated with the implementation of mitigation/compensation measures.

In the implementation of the matrix above 5 degrees of impact can be differentiated:

Table No 5.2.

DEGREE	CRITERIA
0	The activity has no impact.
1 - 3	Low impact which can be avoided without the implementation of special measures other than from utilising the best construction and operation practices;
4 - 6	Average impact which has to be accounted for in combination with other factors and measures for mitigation, restriction or elimination to be recommended;
7 - 9	Significant impact which has to be eliminated by choosing alternatives or implementing mitigation and compensation measures.
10	The activity causes significant and permanent/irreversible negative impact which cannot be eliminated or reduced to acceptable with the implementation of mitigation/compensation measures. This degree of impact requires the implementation of zero alternative.

#### ***V.1 Analysis of the impact of the investment proposal on the bird species subject to conservation in the PA BG0002009 "Zlatiyata" under Directive 2009/147/EC.***

The summarised impact on the birds listed in the conservation objective of the PA „Zlatiyata” with code BG0002009, pursuant to the impact level assessment matrix presented in Table No 5.1, is as follows:

Table No5.3.

Bird Species		Impact level assessment	
English name	Latin name	Degree	Impact
Little white-fronted goose	<i>Anser erythropus</i>	0	<b>No impact.</b> The feeding and breeding of the species are connected mainly with significant large water bodies and their feeding during the autumn-winter period – with open grass covered territories and above all agricultural landscapes of autumn grain crops, but not with forest habitats. Couples of the species do not breed in the country.
Little Bittern	<i>Ixobrychus minutus</i>	0	<b>No impact.</b> The feeding and breeding of the species are connected to water bodies including significant ones but not with forest habitats.
Long-legged Buzzard	<i>Buteo rufinus</i>	0	<b>Practically no impact.</b> The presence of tree vegetation on the site of the IP including large trees suggests using them for bases by the birds (for rest or spending the night) including ones from the PA, and possibly for nesting as well though less likely due to the proximity to the NPP area and parts of the road system. Apart from this there are sufficient areas of the forest territory as well as forest territories in other parts of the region to the west and east near the site. Due to its forest nature the IP area does not represent part of the trophic base (territories) of the species in the area.
White Stork	<i>Ciconia ciconia</i>	0	<b>No impact.</b> The forest territories covered with dense vegetation are neither nesting nor trophic habitats for couples and representatives of the species. The couples of the species practically nest exclusively in residential areas and other anthropologically affected built up territories.
Red-footed Falcon	<i>Falco vespertinus</i>	0	<b>Practically no impact.</b> The presence of tree vegetation, including large trees suggests using them for bases by the birds (for rest or spending the night) including ones from the PA, but no representatives have been registered nearby. A large number of the couples in the country breed in in residential areas and other anthropologically affected built up

			territories. Due to its forest nature the IP area does not represent part of the trophic base of the species in the area (birds hunt mainly in open areas and sometimes over water bodies but not in woods).
Eurasian Bittern	<i>Botaurus stellaris</i>	0	<b>No impact.</b> The feeding and breeding of the species are connected to water bodies exclusively and not with forest habitats.
Woodlark	<i>Lullula arborea</i>	0	<b>Practically no impact.</b> Birds can rest on the trees but only in the outskirts of the forest. In the IP area representatives, also in small and medium sized flocks have been registered in seasonal migrations as early as February – March in open territories and residential areas. Due to its forest nature the IP area does not represent part of the trophic base (territories) of the species in the area, and even less a nesting base. Birds and couples of the species hunt and nest in open territories.
Ortolan Bunting	<i>Emberiza hortulana</i>	0	<b>Practically no impact.</b> Occasional representatives might only use the trees on the outskirts for resting during the periods of seasonal migrations. Nesting attempts including near the forest area are not likely. No representatives and couples of the species have been registered near the forest, most probably due to the presence of several couples of the relative and rival bunting species – the Black-headed Bunting ( <i>Emberiza melanocephala</i> ), and also of the Corn Bunting ( <i>Emberiza calandra</i> ), which are close and larger (stronger) species. Due to its forest nature the IP area does not represent part of the trophic base (territories) of the species in the area.
Calandra Lark	<i>Melanocorypha calandra</i>	0	<b>No impact.</b> Due to its forest nature the IP area does not represent part of the trophic base (territories) of the species in the area, and even less a nesting base. Birds of the species hunt and nest in open territories. No representatives of the species have been registered near the forest.
Great Bustard	<i>Otis tarda</i>	0	<b>No impact.</b> Due to its forest nature the IP area is not suitable as a habitat for the representatives of the species, whose typical habitats are in vast open territories. No evidence of representatives or flocks of the species in this part of the country are found

			during the last several decades apart from the latest two unconfirmed observations of nesting birds in the mid 1990's – near the villages of Zlatiyata and Bezvoditsa, Dobrich region. After 1990 it was observed only in winter.
Common Kingfisher	<i>Alcedo atthis</i>	0	<b>No impact.</b> The feeding and breeding of the species are connected to water bodies including significant ones but not with forest habitats.
European Nightjar	<i>Caprimulgus europaeus</i>	0-1	<b>Probable low impact.</b> The forest area is a suitable habitat for representatives of the species, including for nesting. No representatives have been registered, but it is possible to find some during seasonal migrations. After the implementation of the site in the region will remain sufficient areas of deciduous forest territories, suitable habitat for representatives of the species.
Levant Sparrowhawk	<i>Accipiter brevipes</i>	0-1	<b>Probability for a low impact exists.</b> The presence of tree vegetation on the site of the IP including large trees suggests using them for bases by the birds (for rest or spending the night) including ones from the PA, and possibly for nesting as well though less likely due to the proximity to the NPP area and parts of the road system. Apart from this there are sufficient areas of the forest territory as well as forest territories in other parts of the region to the west and east near the site. <b>In this part of the country couples of the species nest in strips of woods near large rivers.</b> Due to its forest nature the IP area does not represent part of the trophic base (territories) of the species in the area. No representatives have been registered nearby but their eventual presence should not be completely excluded.
Greater short-toed lark	<i>Calandrella brachydactyla</i>	0	<b>Practically no impact.</b> Due to its forest nature the IP area does not represent part of the trophic base (territories) of the species in the area, and even less a nesting base. Birds of the species hunt and nest in open territories. No representatives of the species have been registered near the forest.
Montagu's harrier	<i>Circus pygargus</i>	0	<b>No impact.</b> Birds may use the trees on the outskirts of the forest for resting only occasionally. Representatives and couples of the species hunt and nest exclusively in vast open grass covered territories, and also in wet zones. In this part of the country representatives have been registered

			also during the breeding period (spring and summer) but not near the site where representatives have been registered and reported only in autumn and winter.
Saker Falcon	<i>Falco cherrug</i>	0	<b>No impact.</b> Representatives of the species are not registered in the IP area since they do not hunt in forests. In the country the couples of the species prefer nesting on inaccessible rock formations but in mountains (mostly in Western Star planina).
Little Egret	<i>Egretta garzetta</i>	0	<b>No impact.</b> The feeding and breeding of the species are connected exclusively to water bodies (rarely representatives have been observed to hunt and rest in open territories, but not in woods).
Lesser Spotted Eagle	<i>Aquila pomarina</i>	0	<b>Practically no impact.</b> The presence of tree vegetation on the site of the IP and in its proximity including large trees suggests their use for bases by the birds (for rest or spending the night) including ones from the PA, and possibly for nesting as well, though less likely due to the proximity to the NPP area and parts of the road system. Apart from this there are sufficient areas of the forest territory as well as forest territories in other parts of the region to the west and east near the site. Due to its forest nature the IP area does not represent part of the trophic base (territories) of the species in the area. No nesting or other representatives have been registered in the area of the IP.
Merlin	<i>Falco columbarius</i>	0-1	<b>No impact.</b> In the area and in the country representatives of the species only spend the winter and pass mostly during the seasonal migrations. Due to the presence of small passerine birds during the autumn-winter period (resting or spending the night) in the forest area where the IP site is located which fly over in search of food to nearby or faraway open grasslands, the territory can be considered as part of the trophic base of the species but with insignificant range in this part of the country and with no important contribution to the conservation of the natural status of the habitats of the species in the PA. The trees offer birds of the species places to rest and spend the night
<u>Short-toed Eagle</u>	<i>Circaetus gallicus</i>	0	<b>Practically no impact.</b> The presence of tree vegetation on the site of the IP and in its proximity including large trees



			suggests their use for bases by the birds (for rest or spending the night) including ones from the PA, and possibly for nesting as well, though less likely due to the proximity to the NPP area and parts of the road system. Apart from this there are sufficient areas of the forest territory as well as forest territories in other parts of the region to the west and east near the site. Due to its forest nature the IP area does not represent part of the trophic base (territories) of the species in the area. No nesting or other representatives have been registered in the area of the IP but the species has been observed in this part of the country.
<u>European Honey Buzzard</u>	<i>Pernis apivorus</i>	0	<p><b>Practically no impact.</b></p> <p>The presence of tree vegetation on the site of the IP and in its proximity including large trees suggests their use for bases by the birds (for rest or spending the night) including ones from the PA, and possibly for nesting as well, though less likely due to the proximity to the NPP area and parts of the road system. Apart from this there are sufficient areas of the forest territory as well as forest territories in other parts of the region to the west and east near the site. Due to its forest nature the IP area does not represent part of the trophic base (territories) of the species in the area. No nesting or other representatives have been registered or reported in the area of the IP due to which stops for feeding and resting during roamings and migrations are unlikely as the passing of high flying representatives is possible only during seasonal migration periods.</p>
Tawny Pipit	<i>Anthus campestris</i>	0	<p><b>Practically no impact.</b></p> <p>Birds may use the trees on the outskirts of the forest for resting and spending the night only occasionally and outside the nesting period since no nesting couples of this species have been registered nearby also because of the distance the PA territory, where they nest. Representatives and couples of the species feed and nest in open grassland areas but not in woods. No representatives of the species have been registered nearby.</p>
Hen Harrier	<i>Circus cyaneus</i>	0	<p><b>No impact.</b></p> <p>Birds may use the trees on the outskirts of the forest for resting only occasionally. Representatives and couples of the species hunt and nest exclusively in vast open grass covered</p>

			territories, and also in wet zones. Nesting in the IP area and in this part of the country has not been registered nor reported (not for the nesting species in the country at least in the recent several decades). Representatives have been registered and reported only in autumn and winter in the IP area and in the country.
Purple Heron	<i>Ardea purpurea</i>	0	<b>No impact.</b> The feeding and breeding of the species are connected exclusively to water bodies (rarely representatives have been observed to hunt and rest in open territories, but not in woods).
Common Crane	<i>Grus grus</i>	0	<b>No impact.</b> The feeding and breeding of the species are connected to open grass territories (and feeding sometimes in water bodies) but not in woods.
Grey-headed Woodpecker	<i>Picus canus</i>	0-1	<b>Possible low impact.</b> No representatives have been registered but it is possible to be found mainly during food migrations (roamings) during the autumn-winter period. The forest territory with the IP site can be evaluated as suitable to some extent as a trophic and even nesting habitat for representatives and couples of the species due to its forest nature (unlike its close relative the European green woodpecker ( <i>Picus viridis</i> ), which prefers sparse forest and semi-open territories with large trees, the Grey-headed woodpecker inhabits forest habitats formed by dense tree plantations such as the forest territory where the IP site is located). Representatives and couples of the species in this part of the country have been registered mainly in dense forests along the banks of the Danube and these are probably the most suitable nesting and trophic habitats for this species, whereas the conditions within the forest territory with the IP area possibly due to the distance from the river are not attractive enough as a habitat. Apart from this in the IP site remains a large part of the forest territory which will continue to perform the function of potential trophic base for representatives of the species.
European Roller	<i>Coracias garrulous</i>	0	<b>No impact.</b> No representatives of the species have been registered on the forest territory. The main part of the couples in the IP area and in this part of the country nest in strips of woods along rivers and mainly along the banks of the Danube (and on islands in the river) which practically excludes

			any nesting attempts in the forest territory despite the presence of large trees (however few in number) in hollows of the couples of the species nest. Due to its cover of dense tree and shrub vegetation the site as well as the entire forest area cannot be considered part of the trophic base of the species.
Syrian pecker	Wood	<i>Dendrocopos syriacus</i>	<p><b>Low negative impact.</b></p> <p>No representatives were registered during the filed surveys in the IP area, but it should not be excluded especially during the autumn-winter while roaming and searching for food. The implementation will affect some insignificant part of the trophic base of the species in the area by removing part of the tree vegetation in the forest territory. This territory might also be considered to some extent as part of the nesting base of the species but with a lesser probability, since the couples avoid dense forest areas such as this one when nesting. This is the reason that the main part of the couples of the species in the IP area nest mostly in residential areas and other built-up territories, as well as near them – in places with sparse tree vegetation, riparian forests, orchards, etc. and similar habitats with scarce tree and shrub vegetation. The species is the most commonly found species of woodpecker in residential areas (Piciformes, Picidae) in the country (Yankov, 1986).</p>
Peregrine Falcon		<i>Falco peregrinus</i>	<p><b>No impact.</b></p> <p>The representatives and couples of the species do not inhabit nor nest in dense forests since they are not capable of successful hunting there. Since the species feeds almost entirely on other birds, the birds inhabiting the forest territory can be considered a small insignificant part of its trophic base in the region. No representatives were registered during the field surveys in the IP area (birds can appear in the area during roaming and mostly during seasonal migrations and roamings during the autumn-winter period).</p>
Pallid Harrier		<i>Circus macrourus</i>	<p><b>No impact.</b></p> <p>Birds may use the trees on the outskirts of the forest for resting only occasionally. Representatives and couples of the species hunt and nest exclusively in vast open grass covered territories, and also in wet zones. Nesting in the IP area and in this part of the country has not been registered nor reported (not for the nesting</p>

			species in the country at least in the recent several decades). Representatives have been registered and reported only in autumn and winter in the IP area and in the country.
Western Marsh Harrier	<i>Circus aeruginosus</i>	0	<p><b>No impact.</b></p> <p>Birds may use the trees on the outskirts of the forest for resting only occasionally. Representatives and couples of the species hunt and nest exclusively in vast open grass covered territories, and also in wet zones but not in woods. Nesting in the IP area and in this part of the country has not been registered nor reported. Representatives have been registered and reported only in autumn and winter (in regions with water bodies and/or wet zones representatives are found all year round but the IP site is far from such sites / habitats).</p>
Red-backed Shrike	<i>Lanius collurio</i>	0-1	<p><b>Practically no impact.</b></p> <p>Birds of this species might use the trees for resting but only on the outskirts of the forest territory where the IP area is located. Nesting attempts are unlikely. Near the forest area representatives and couples have been registered on lower trees in nearby open territories, including on trees on both sides of the road to Kozloduy, as well as near arable agricultural lands. Due to the dense coverage of trees and shrubs it is not part of neither the trophic nor nesting base of the species in the area since its representatives avoid dense forest areas.</p>
Black Kite	<i>Milvus migrans</i>	0	<p><b>Practically no impact.</b></p> <p>The presence of tree vegetation on the site of the IP and in its proximity including large trees suggests their use for bases by the birds (for rest or spending the night) including ones from the PA, and possibly for nesting as well though less likely due to the proximity to the NPP area and parts of the road system. Apart from this after the implementation of the IP there will remain sufficient areas of the forest territory as well as forest territories in other parts of the region to the west and east near the site. In various areas of the country, including this, a significant part of the couples nest in forests near rivers and other water bodies.</p> <p>Due to its forest nature the IP area does not represent part of the trophic base (territories) of the species in the area.</p>
Lesser Grey Shrike	<i>Lanius minor</i>	0	<b>Practically no impact.</b>

			Birds of this species might use the trees for resting but only on the outskirts of the forest territory where the IP area is located. Nesting attempts are unlikely. Due to the dense coverage of trees and shrubs it the IP area is not part of neither the trophic nor nesting base of the species in the area. No representatives have been registered near the forest area.
Barred Warbler	<i>Sylvia nisoria</i>	0	<p><b>Practically no impact.</b></p> <p>Birds of this species might use the trees for resting but only on the outskirts of the forest territory. Due to its forest nature the IP area does not represent part of the trophic base (territories) of the species in the area since they avoid dense forest areas. No nesting or other representatives have been registered or reported in the area of the IP but some might pass during seasonal migration periods.</p>

The analysis performed so far in IV.5.2.1 on the basis of the identification of the possible impacts on each species subject to conservation in the PA „Zlatiyata” and on the summarised assessment of the level of the impact on the bird species in the *Table No 5.3* above can lead to the conclusion that the construction, operation and decommissioning of the NRAWR will not be able to cause inadmissible impacts on the purposes and subject of conservation in PA “Zlatiyata” with code BG0002009 due to the following circumstances:

- The implementation of the IP does not involve accessing the protected area and using parts of it for building of buildings and facilities or other access infrastructure elements (roads, drainages, power lines, etc.) due to which it **will have no direct impact on its territory integrity** and respectively on the described land cover classes in it which represent target habitats of the birds protected in the PA. **In this case the IP does not interfere with the first major conservation objective of the area which is: “Preserving the area of natural habitats and species habitats and their populations subject to conservation in the protected area”;**
- The implementation of IP, as motivated in *Table No 2.1*, *Table No 2.2* (including the texts after them) and *Table No 3.2* will not cause any significant and inadmissible additional impacts on the PA territory and the habitats in it arising from various types of pollution (including radiation) due to which it can be concluded that **there will be no direct/indirect impacts resulting in modifying abiotic and biotic factors on the territory of the PA** and respectively of these factors in the described land cover habitats in it which represent target habitats of the birds protected in the PA. **In this case the IP does interfere with the second major conservation objective of the area which is: “Preserving the natural condition of the natural habitats and species habitats subject to conservation in the protected area, including of the natural species composition, specific species and conditions of the environment for these habitats”;**
- Considering the information stated in the previous positions above there is no reason



why the implementation of the IP should obstruct in any way any possible restoration and renovation activities related to areas and habitats in the protected area. **In this case the IP does not interfere with the third and last major conservation objective of the area which is: "Restoring if necessary the area and natural condition of the natural habitats and species habitats, and of populations of the species subject to conservation in the protected area"**. It must be taken into account here that the territory on which the IP will be implemented is anyway of anthropogenic nature since it was artificially afforested after the NPP was constructed, mainly with introduced invasive tree species non-typical for the region, due to which **it does not represent a natural habitat of the species subject to conservation in the protected area**.

- For the bird species subject to conservation in the PA „Zlatiyata”, the Black Locust plantation of artificial origin in which the IP site is located, can to some small extent and probability be used for nesting by the European nightjar (*Caprimulgus europaeus*), the Levant sparrowhawk (*Accipiter brevipes*), the grey-headed woodpecker (*Picus canus*) and the Syrian woodpecker (*Dendrocopos syriacus*), but during the field surveys and site observations no nesting of these species has been registered. In this respect the implementation of the IP cannot lead to death of representatives of the species subject to conservation in the protected area and therefore changes in the established numbers of these species in the protected area caused by the realization of the reviewed IP. Its implementation cannot also impact the breeding of the species in the area itself since as already reported above in section IV.5.2.1 and the preceding three sections, no habitats of theirs are affected on the territory of the PA. The Black Locust plantation itself is of isolated nature as a whole in the region and does not turn into forest communities in the area itself (i.e. it is not part of it) – in its closest part and overall in *over ten kilometre radius further inside the area* (according the Corine land cover system 2006) are located almost only arable agricultural lands which do not provide conditions for nesting of these four species.

The Black Locust plantation of artificial origin in which the IP site is located can be assessed to some extent as a habitat with different contribution for the feeding of several of the species subject to conservation in the PA - European Nightjar (*Caprimulgus europaeus*), Levant Sparrowhawk (*Accipiter brevipes*), Merlin (*Falco columbarius*), Grey-headed Woodpecker (*Picus canus*), Syrian Woodpecker (*Dendrocopos syriacus*), Red-backed Shrike (*Lanius collurio*) – mainly the outskirts of the plantation and for the Barred Warbler (*Sylvia nisoria*) – the outskirts. The implementation of the site will affect only the non-significant potential trophic base of these species in forest areas in the region as a whole - resulting from the removal of part of the tree vegetation in the affected forest territory. In this case in the PA „Zlatiyata” are available sufficient habitat areas – almost **8,700 dca** natural and cultivated tree covered areas (according to the Standard Natura 2000 data form), which provide similar trophic conditions for the representatives of the seven species registered in in the protected area, and some of them also hunt in its open and shrub-covered territories. Apart from this it is necessary to add that near the site of the IP will remain a sufficient area of the forest territory since pursuant to the project the specific areas of the IP planned to be built up compactly only cover about 20% of the site itself (or 87 dca), whereas the vegetation cover will be preserved on 132.6 dca within the site of 464 dca, which are part of a cultivated forest

community covering an area of about 950 dca in total (according to Corine 2006), or about 620 dca tree-covered areas will remain unaffected in the region which will continue to fulfil the functions of a potential trophic habitat for the 7 species mentioned above. In this case the quantity parameters of the number of species registered in the area are not expected to be affected as a result of a loss of trophic biotopes outside of its range, even if representatives of the zone are using feeding biotopes outside of it, as it is also necessary to state that in the other adjacent territories and nearby terrains there are also woodland areas which provide similar trophic conditions.

All this leads to the conclusion that the implementation of the IP does not involve a risk of diminishing the size and density of the established congregations of bird species subject to conservation in the PA „Zlatiyata”, due to which it can be accepted that it will not impact negatively the existing condition of the subject of conservation of the protected area.

**It is essential to take into account as well that the nature of the IP does not contradict in any way the prohibition measures adopted within the protected area by Ordinance No PJ-548/05.09.2088 of the MoEW, namely:**

- IP does not involve removal of landscape features within the protected area (field boundaries, single groups of trees, forest protection belts, stone fences and hedges) while using the agricultural lands as such. The IP does not involve use of agricultural lands outside the protected area as well;
- IP does not involve afforestation of meadows, pastures and common lands within the protected area as well as converting them to arable lands and permanent culture lands. The IP does not affect meadows, pastures and common lands outside the protected area as well and does not involve creating arable lands and permanent cultures at all;
- IP does not involve at all the use of mineral fertilizers and pesticides in pastures and meadows, even less within the PA;
- IP does not involve at all mowing any pastures or meadows whatsoever nor in the PA, neither outside of it since it affects an artificially afforested area;
- IP does not involve activities related to drying up or draining of marshes, meadows and natural water bodies within the PA since the implementation of the IP does not involve such type of impacts whatsoever even outside the area, since it affects an artificially afforested area in which there are no marshlands, wet areas, natural or artificial water bodies which are subject to draining and are in any way indirectly connected to the PA territory;
- IP does not involve any replacement whatsoever of riparian forests of local species with non-local ones at a distance of 50 m from the borders of water bodies – no rivers cross the site of the IP towards or from the protected area, and the affected area is covered by an artificially created forest consisting of non-local introduced species some of which are even of invasive nature.

**Conclusion: under these premises it is safe to state that the construction and operation of the NRAWR cannot significant impacts and irreparable damages on the purposes and subject off conservation in PA „Zlatiyata” with code BG0002009, since the implementation of the project will not result in destruction or deterioration of the quality of the habitats of the target bird species in the area, nor in reduction of their numbers**

since the implementation of the IP does not violate in any way whatsoever the adopted prohibition measures in the protected area.

**V.2** *Analysis of the impact of the investment proposal on the habitats and species subject to conservation in PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River" and PA BG0000508 "Skat River", all approved under Directive 92/43/EEC.*

**V.2.1** *Expected impacts and degree of impact on the habitats subject to conservation in PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River" and PA BG0000508 "Skat River"*

The assessment of the degree of the impact of the implementation of the NRRAW on the natural habitats (under Dir. 92/43/EEC) subject to conservation in the nearest protected areas PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River" and PA BG0000508 "Skat River" is based on the impact of each of the criteria for Favourable conservation status - area of the habitats in the area (if there are specific, smaller in area but important habitats, they should be reported separately), quality of the habitats (structural and functional parameters), future prospects (threats and impacts). In addition, other structural and functional parameters are reported separately, such as total functional role of the areas for connectivity of the networks - geographical connectivity. According to the definition of "Favourable conservation status", defined by Article 1(e) of the Habitats Directive (Dir. 92/43/EEC), the conservation status of a natural habitat is considered "favourable" if:

- its natural range (area), and the areas it covers within that range, are stable or increasing, and
- there are the necessary structure and functions for its long-term maintenance and it is likely for them to continue to exist in the foreseeable future, and
- the conservation status of its typical species is favourable, in accordance with the definition of the conservation status of species.

In this case, based on the analysis of the range of distribution of the plant communities in the area of the investment proposal (subsection IV.5.1), and given the parameters of the proposal and the conclusions for the expected impacts of its implementation on the individual components of the environment in the REIA, as a result of the overall implementation of the project, no direct or significant indirect impacts should be expected on the types of natural habitats subject to conservation in the nearest protected areas of the ecological network Natura 2000. No direct loss or fragmentation of elements of target habitats is expected as a result of the construction and operation of the repository since its area is, on the one hand, outside the scope of the habitats listed in Annex I of Directive 92/43/EEC and, on the other hand, they are outside protected areas where the habitats included in this Annex are subject to targeted conservation. With regard to potential secondary/indirect impacts, the target habitats in the nearest PA are not located in close proximity to the elements of the NRRAW and are practically relatively remote from the site. In this situation, in terms of potential hazards generated by the project, including potential radiation, there is sufficient space to dissipate to completely harmless concentrations and levels, much before reaching the boundaries of the areas.

The preliminary identification of the expected effect and impact of the **construction, operation, closure and institutional control** of the NRRAW on all habitats included in the scope of conservation of PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River" and PA BG0000508 "Skat River" are presented in the following table:

Table № 5.4.

<b>Expected impact on the habitats subject to conservation in PA BG0000533 "Kozloduy Islands", PA</b>
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BG0000614 "Ogosta River" and PA BG0000508 "Skat River"													
Habitat (code)	Type of impact		Continuance		Duration			Cumulative impact	Type of impact		Criterion of impact		
	Direct	Indirect	Temporary	Constant	Short-term	Medium-term	Long-term		Negative	Positive	Loss of area (%)	Quality	Prospects
1530*	0	0	0	0	0	0	0	0	0	0	0	0	0
3130	0	0	0	0	0	0	0	0	0	0	0	0	0
3150	0	0	0	0	0	0	0	0	0	0	0	0	0
3260	0	0	0	0	0	0	0	0	0	0	0	0	0
3270	0	0	0	0	0	0	0	0	0	0	0	0	0
6250*	0	0	0	0	0	0	0	0	0	0	0	0	0
6430	0	0	0	0	0	0	0	0	0	0	0	0	0
6510	0	0	0	0	0	0	0	0	0	0	0	0	0
91F0	0	0	0	0	0	0	0	0	0	0	0	0	0
91Z0	0	0	0	0	0	0	0	0	0	0	0	0	0
91E0*	0	0	0	0	0	0	0	0	0	0	0	0	0

**Degree of impact on the habitats subject to conservation in PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River" and PA BG0000508 "Skat River".**

The analysis of the natural habitats in the nearest protected areas of the ecological network Natura 2000 close to the required area for the construction of the IP indicates the following impact of its implementation on the types of natural habitats subject to conservation in **PA BG0000533 "Kozloduy Islands", PA BG0000614 "Ogosta River" and PA BG0000508 "Skat River"** and not falling within or near "Radiana" site where the NRRAW will be constructed:

- **1530\* PANNONIAN SALT STEPPES AND SALT MARSHES.**

The habitat covers saline steppes, riparian lowlands, periphery of swamps and bogs under the conditions of a continental climate with high temperatures and drought in the summer. Salinisation of land is due to the formation of spills in the spring and abundant evaporation of soil water in the summer. Salts spues are frequently observed on the soil surface. These habitats are of natural origin, but also partially of secondary origin as a result of the impact of grazing and drainage. Dry halophytic communities of primary saline rocks (marls) can also be included in them. Halophytic vegetation consists of communities of diverse annual and perennial typical halofiti. Higher participation of atypical halofiti is observed in some riverside lowlands along the Danube River, where salinization processes have intensified after the drainage of riparian wetlands.

**The habitat is included only in the standard Natura 2000 form for PA BG0000508 "Skat River" with a value of area coverage of 0.03% of the territory of the area (i.e. 1.23 decares). Subsequently, in the listing and description of the habitats in this PA under the project "Mapping and determining the conservation status of natural habitats and species - Stage I" under Operational Program Environment 2007 – 2013, this habitat is not identified in the area and therefore should not be subject to assessment of the degree of impact.**

• **3130 OLIGOTROPHIC TO MESOTROPHIC STANDING WATERS WITH VEGETATION OF LITTORELLETEA UNIFLORAE AND/OR ISOETO-NANOJUNCETEA TYPE.**

In Bulgaria there are two subtypes at different altitudes:

- A) Aquatic communities of low perennial species in the oligotrophic to mesotrophic mountain lakes (Rila and Pirin), more often in the shallow peripheral sections, at the border between water and land (order Littorelletalia uniflorae).
- B) Lowland pioneer communities of annual hygrophytes, developing on the drying wet sediments (silt and sand) in the second half of the summer, in the periphery of large shallow lakes and along the banks of the large rivers. They have a dynamic nature and change each year depending on the water level and period of drought. They belong to Isoeto-Nanojuncetea class and Nanocyperion flavescentis alliance.

**The habitat is included only in the standard Natura 2000 form for PA BG0000533 "Kozloduy Islands" with a value of area coverage of 4% of the territory of the area (i.e. 363.6 decares). Subsequently, in the listing and description of the habitats in this PA under the project "Mapping and determining the conservation status of natural habitats and species - Stage I" under Operational Program Environment 2007 – 2013, this habitat is not identified in the area and therefore should not be subject to assessment of the degree of impact.**

• **3150 NATURAL EUTROPHIC LAKES WITH VEGETATION OF MAGNOPOTAMION OR HYDROCHARITION TYPE.**

The habitat is represented by eutrophic to mesotrophic riparian lakes, estuaries and firths mostly with turbid water, rich in organic matter, usually with pH > 7. There are many diverse hydrophytic communities in them: of free-floating plants on the surface of the water from *Hydrocharition* alliance; of rooted at the bottom plants with floating leaves of *Nymphaeion* alliance, or in deeper and open water with associations of submerged macrophytes of *Potamonion* alliance. They also include reservoirs with partly anthropogenic origin, e.g. abandoned flooded ballasts, old beds if overgrown with such vegetation. They don't include the strips of reed and cattail or reservoirs completely overgrown with hygrophytes. **Such areas are not represented in the vicinity of the site of the IP.**

**The habitat is included only in the standard Natura 2000 form for PA BG0000614 "Ogosta River" with a value of area coverage of 6.79% of the territory of the area (i.e. 927 decares). Subsequently, in the listing and description of the habitats in this PA under the project "Mapping and determining the conservation status of natural habitats and species - Stage I" under Operational Program Environment 2007 – 2013, this habitat is identified in PA BG0000533 "Kozloduy Islands" with an area of 36.9 decares, and the area in PA "Ogosta River" is updated to actual 21.2 decares (according to subsection 4.1.1 of the report on the project). The nearest part of the habitat in PA BG0000533 is located at about 8 km in a beeline from "Radiana" site (from the upper part of the island) and in PA BG0000614 – at 12 km (near the village of Kriva Bara). These distances ensure the absence of direct and indirect impacts on the habitat of the potential hazards generated as a result of the implementation of the IP, and the expected degree of the impact on the habitat is as follows:**

Table № 5.5.

Assessment of the degree of impact of the IP on habitat 3150				
Impact (degree)	Parameters			
	Total area	Species composition	Quality	Prospects
Zero alternative	0	0	0	0



IP	0	0	0	0
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• **3260 VALLEY OR MOUNTAIN RIVERS WITH VEGETATION OF *RANUNCULION FLUITANTIS* AND *CALLITRICHIO-BATRACHION* TYPE.**

The habitat is represented by river stretches in the middle and lower watercourses (in plains and valleys at an altitude of 0 to 1000 m), with attached water vegetation, mostly from the alliances *Ranunculion fluitantis* and *Callitricho- Batrachion*. The bottom is clayey, silty-clayey or silty-sandy, rarely including gravel. The water speed is slow, the depth of the river is small. A spring maximum and an autumn minimum of the runoff is observed. The sections with the slowest watercourse - bays and pools accumulate the largest amount of silty sediments, creating an opportunity for settlement of typical hydrophytes and in the coastal area and the bays, where there is no watercourse or very weak watercourse, there are coenoses of hygrophytes. **Such watercourses are not represented in the vicinity of the site of the IP.**

**The habitat is included only in the standard Natura 2000 form for PA BG0000614 "Ogosta River" with a value of area coverage of 0.18% of its territory (i.e. 24.6 decares) and for PA BG0000508 "Skat River" with a value of area coverage of 0.06% of its territory (i.e. 2.5 decares).** Subsequently, in the listing and description of the habitats in the two areas under the project "Mapping and determining the conservation status of natural habitats and species - Stage I" under Operational Program Environment 2007 – 2013, the area in PA "Ogosta River" is updated to actual 628 decares, and in PA "Skat River" – to 528 decares. The nearest part of the habitat in the first area is located at about 6.5 km to the east in a beeline from "Radiana" site (on the other side of the village of Hurllets), and the second one – at about 5.5 km to the east (again on the other side of the village of Hurllets). These distances ensure the absence of direct and indirect impacts on the habitat of the potential hazards generated as a result of the implementation of the IP (also in view of the need to protect the health of the population of the village of Hurllets), and the expected degree of the impact on the habitat is as follows:

Table № 5.6.

Assessment of the degree of impact of the IP on habitat 3260				
Impact (degree)	Parameters			
	Total area	Species composition	Quality	Prospects
Zero alternative	0	0	0	0
IP	0	0	0	0

• **3270 RIVERS WITH MUDDY BANKS WITH *CHENOPODION RUBRI* AND *BIDENTION P.P.***

This habitat is represented by muddy riverbanks in the lowlands with annual pioneer nitrophilous, including ruderal communities of the alliances *Bidention p.p.* and *Chenopodion rubri*. In the spring and early summer, the places look like muddy banks without vegetation - it develops later in the summer. If the conditions are not favourable - long flooding for example, this vegetation can develop in a limited way or not show at all. Most often this is dense overgrowth of *Bidens spp.*, *Xanthium italicum* and other neophytes on the banks of the large rivers. **Similar riverbanks are not represented in the vicinity of the site of the IP.**

**The habitat is included in the standard Natura 2000 forms for all three considered protected areas** with values of area coverage from 2% (i.e. 182 decares) of the territory of PA BG0000533 "Kozloduy Islands", 0.18% (24.6 decares) of the territory of PA BG0000614 "Ogosta River" and 0.03 percent (1.22 decares) of the territory of PA BG0000508 "Skat River". Subsequently, in the listing and description of the habitats in the three areas under the project "Mapping and determining the conservation status of natural habitats and species - Stage I"

under Operational Program Environment 2007 – 2013, its area is updated to actual 83 decares, 177.2 decares and 8.5 decares respectively. The nearest part of the first of the three listed areas is located at about 5.5 km to the north-northwest in a beeline from "Radiana" site (on the other side of the town of Kozloduy), in the second – also 5.5 km but to the east, and in the third – at about 6.5 km southeast in a beeline (on the other side of the village of Hurlets). These distances ensure the absence of direct and indirect impacts on the habitat of the potential hazards generated as a result of the implementation of the IP (in view also of the need to protect the health of the population of the town of Kozloduy and the village of Hurlets), and the expected degree of the impact on the habitat is as follows:

*Table № 5.7.*

<i>Assessment of the degree of impact of the IP on habitat 3270</i>				
<i>Impact (degree)</i>	<i>Parameters</i>			
	<i>Total area</i>	<i>Species composition</i>	<i>Quality</i>	<i>Prospects</i>
Zero alternative	0	0	0	0
IP	0	0	0	0

• **6250 \* PANNONIAN LOESS STEPPE GRASSLAND COMMUNITIES.**

The habitat represents loess hills dominated by grasses and grassland steppes and grazing lands. The thickness of the loess reaches 30-50 m and is covered with black soil with varying degrees of degradation. Depending on the capacity of the soil, either dense-tufts steppes dominated by *Chrysopogon gryllus*, *Dichanthium ischaemum*, *Stippa tirsia*, or in some places with outcrops of loess - more open communities of *Stipa capillata*, *Agropyron cristatum*, *Kochia prostrata* and *Artemisia campestris*. They are preserved only on the slopes of some steep loess forms, **which are absent in the area of the IP**. Very typical steppe species are found in these communities. **Similar plant communities are not represented in the vicinity of the site of the IP** – on the other side of the road between the village of Hurlets and the town of Kozloduy there are mainly arable farmlands.

**The habitat is included in the standard Natura 2000 forms for PA BG0000614 "Ogosta River" with a value of area coverage of 8.77% of its territory (i.e. 1198 decares) and for PA BG0000508 "Skat River" with a value of area coverage of 0.397% of its territory (i.e. 16.2 decares).** Subsequently, in the listing and description of the habitats in the two areas under the project "Mapping and determining the conservation status of natural habitats and species - Stage I" under Operational Program Environment 2007 – 2013, the area in PA "Ogosta River" is updated to actual 1460.4 decares (according to subsection 4.1.1 in the report on the project), and in PA "Skat River" – to 456.6 decares. The nearest part of the habitat in the first area is located at about 7 km to the east in a beeline from "Radiana" site (on the other side of the village of Saraevo), and in the second one – at about 14 km to the south (between the villages Krushovitsa and Lipnitsa). These distances ensure the absence of direct and indirect impacts on the habitat of the potential hazards generated as a result of the implementation of the IP (also in view of the need to protect the health of the population of the village of Saraevo), and the expected degree of the impact on the habitat is as follows:

*Table № 5.8.*

<i>Assessment of the degree of impact of the IP on habitat 6250*</i>				
<i>Impact (degree)</i>	<i>Parameters</i>			
	<i>Total area</i>	<i>Species composition</i>	<i>Quality</i>	<i>Prospects</i>
Zero alternative	0	0	0	0
IP	0	0	0	0

• **6430 HYDROPHILIC COMMUNITIES OF TALL GRASS IN THE PLAINS AND IN THE MOUNTAIN TO ALPINE ZONE.**

The habitat includes communities of eutrophic tall grasses of 3 subtypes:

- A) Flooded meadows and lawns in the riparian forests, overgrown with tall grasses (*Veronico longifoliae-Lysimachion vulgaris*).
- B) Wet and nitrophilous tall-grass communities near watercourses and on the borders of forests belonging to the orders *Glechometalia hederaceae* and *Convolvuletalia sepium* (alliance *Aegopodion podagrariae* and *Filipendulion*).
- C) Hydrophilic communities of tall perennial grasses in the mountain and alpine zone of class *Betulo-Adenostyletea*.

**Such communities are not represented in the vicinity of the site of the IP since there are no rivers passing nearby.**

As of the time of preparation of the assessment, the habitat is not included in the standard Natura 2000 form for any of the three considered protected areas. It was established additionally, as a result of the implementation of the project "Mapping and determining the conservation status of natural habitats and species - Stage I" under Operational Program Environment 2007 – 2013 on the territory of PA BG0000508 "Skat River" on an area of 48 decares, with 185.7 decares proposed as a reference value. According to the map of the range of the habitat, its nearest part is located 16 km south of the site in a beeline, on the other side of the village of Lipnitsa. This significant distance ensures the absence of any direct or indirect impact on the habitat of the potential hazards generated as a result of the implementation of the IP, and the expected degree of the impact on the habitat is as follows:

Table № 5.9.

Assessment of the degree of impact of the IP on habitat 6430				
Impact (degree)	Parameters			
	Total area	Species composition	Quality	Prospects
Zero alternative	0	0	0	0
IP	0	0	0	0

• **6510 LOWLAND HAY MEADOWS.**

The habitat covers mesophilic hay meadows of class *Molinio-Arrhenatheretea* (alliances *Arrhenatherion*, *Deschampsion*). They develop on rich soils - most often on alluvial-meadow and vertisols in the river plains, wet gullies and valley fields. Communities dominated by wheat grasses and very rich diversity of grass. Most of them are mowed 1-2 times a year after the end of the active vegetation season. There are wet to dry subtypes. Active grazing leads to impoverishment and drying of the soil. **Similar plant communities are not represented in the vicinity of the IP-** on the other side of the road between the village of Hurllets and the twon of Kozloduy there are mainly arable farmlands.

As of the time of preparation of the assessment, the habitat is not included in the standard Natura 2000 form for any of the three considered protected areas. It was established additionally, as a result of the implementation of the project "Mapping and determining the conservation status of natural habitats and species - Stage I" under Operational Program Environment 2007 – 2013 on the territory of PA BG0000508 "Skat River" on an area of 240.4 decares, with 245.6 decares proposed as a reference value. According to the map of the range of the habitat, its nearest part is located at about 14 km south in a beeline (between the villages of Krushovitsa and Lipnitsa). This significant distance

ensures the absence of any direct or indirect impacts on the habitat of the potential hazards generated as a result of the implementation of the IP, and the expected degree of the impact on the habitat is as follows:

Table № 5.10.

Assessment of the degree of impact of the IP on habitat 6510				
Impact (degree)	Parameters			
	Total area	Species composition	Quality	Prospects
Zero alternative	0	0	0	0
IP	0	0	0	0

• **91F0 RIPARIAN MIXED FORESTS OM QUERCUS ROBUR, ULMUS LAEVIS AND FRAXINUS EXCELSIOR OR FRAXINUS ANGUSTIFOLIA ALONG LARGE RIVERS (ULMENION MINORIS).**

The habitat includes periodically flooded riparian mixed deciduous forests. The soil can dry well between the floodings or remain too wet. These forests have developed on new alluvial deposits. Depending on the water regime, the dominant tree species belong to the genus *Fraxinus*, *Ulmus* or *Quercus*. **Grass vegetation is well developed. River banks with similar vegetation are not represented in the vicinity of the site of the IP, as there are no rivers passing nearby.**

The habitat is included in the standard Natura 2000 forms for PA BG0000533 "Kozloduy Islands" with a value of area coverage of 0.0622% (i.e. 5.65 decares) and for PA BG0000508 "Skat River" with a value of area coverage of 9% of its territory (i.e. 367.7 decares). Subsequently, in the listing and description of the habitats in the two areas under the project "Mapping and determining the conservation status of natural habitats and species - Stage I" under Operational Program Environment 2007 – 2013, its area coverage in PA "Kozloduy Islands" is updated to actual 31.7 decares, and in PA "Skat River" - to 103 decares. The nearest part of the habitat in the first area is located at about 4.5 km to the north in a beeline from "Radiana" site (slightly north of the village of Altimir). These distances ensure the absence of direct and indirect impacts on the habitat of the potential hazards generated as a result of the implementation of the IP, and the expected degree of the impact on the habitat is as follows:

Table № 5.11

Assessment of the degree of impact of the IP on habitat 91F0				
Impact (degree)	Parameters			
	Total area	Species composition	Quality	Prospects
Zero alternative	0	0	0	0
IP	0	0	0	0

• **91Z0 MOESIAN FORESTS OF TILIA TOMENTOSA.**

The habitat covers xerophytic to meso-xerophytic forests dominated by silver-leaved linden (*Tilia tomentosa*), distributed in the continental regions of Northern Bulgaria. These forests are found mainly in the hilly plains and mountain foothills - the largest massives are located in Ludogorie, on the northern and eastern slopes on a diverse basis: loess, limestone etc. At some places the lime-tree has secondarily expanded its spreading mainly as a result of the selective cutting of oak-trees - *Quercus cerris*, *Q. petraea* agg., *Q. robur*, with which it often forms mixed cenoses. The composition of these forests includes both xerothermal species of the genus *Quercetalia* (*Helleborus odorus*, *Ligustrum vulgare*), and more mesophilic species of the genus *Fagetalia* and alliance *Carpinion* (*Scilla bifolia*, *Staphylea pinnata*). **Such forests are not**

represented at the site of the IP or in its adjacent territories - the area is occupied by acacia forest, where the main dominant species is acacia (*Robinia pseudoacacia*), and the linden species have only a marginal part at certain places of small-leaved linden (*Tilia cordata*), instead of silver-leaved linden.

The habitat is included in the standard Natura 2000 forms for PA BG0000614 "Ogosta River" with a value of area coverage of 0.5% of its territory (i.e. 68.3 decares). Subsequently, in the listing and description of the habitats in the two areas under the project "Mapping and determining the conservation status of natural habitats and species - Stage I" under Operational Program Environment 2007 – 2013, its area in PA "Ogosta River" is updated to actual 72.4 decares. The nearest part of the habitat in PA BG0000533 is located at about 9 km to the east in a beeline from "Radiana" site (on the other side of the village of Saraevo). This distance ensures the absence of direct and indirect impacts on the habitat of the potential hazards generated as a result of the implementation of the IP (also in view of the need to protect the health of the population of the village of Saraevo), and the expected degree of the impact on the habitat is as follows:

Table № 5.12

Assessment of the degree of impact of the IP on habitat 91Z0				
Impact (degree)	Parameters			
	Total area	Species composition	Quality	Prospects
Zero alternative	0	0	0	0
IP	0	0	0	0

• **91E0 \* ALLUVIAL FORESTS WITH *ALNUS GLUTINOSA* AND *FRAXINUS EXCELSIOR* (*ALNO-PADION*, *ALNION INCANAE*, *SALICION ALBAE*).**

Riparian forests in the lowlands and mountains. They develop on rich alluvial soils, periodically flooded by the seasonal high water of the river. Three subtypes can be distinguished:

- A) Monodominant forests of *Alnus glutinosa* with single participation of *Fraxinus oxycarpa* (alliance *Alno-Padion*) in the lower watercourses of the rivers of the Black Sea and the Mediterranean basin;
- B) Riparian communities of *Alnus glutinosa* and/or *Alnus incana* in the upper and middle watercourses of the rivers (*Alnion incanae*);
- B) Riparian, floodplain forests or galleries dominated mainly by *Salix alba*, *Populus alba* and *Populus nigra* and to a smaller extent by *Salix fragilis*, which belong to the alliance *Salicion albae*.

River banks with similar vegetation are not represented in the vicinity of the site of the IP since there are no rivers passing nearby.

The habitat is included in the standard Natura 2000 forms for all three considered protected areas with values of area coverage from 14.2% (i.e. 1291 decares) of the territory of PA BG0000533 "Kozloduy Islands", 0.213% (29 decares) of the territory of PA BG0000614 "Ogosta River" and 2.205% (90 decares) of the territory of PA BG0000508 "Skat River". Subsequently, in the listing and description of the habitats in the three areas under the project "Mapping and determining the conservation status of natural habitats and species - Stage I" under Operational Program Environment 2007 – 2013, the habitat is found only in the first 2 areas, and its area is updated to actual 2309.7 and 62.9 decares respectively. The nearest part of habitat in PA "Kozloduy Islands" is located at about 4 km to the north in a beeline from "Radiana" site (near the water intake channel of Kozloduy NPP, on the other side of the site of the power plant), and in PA "Ogosta River" – at about 13 km south (in one of the meanders of



the river on the other side of the village of Kriva Bara). These distances ensure the absence of direct and indirect impacts on the habitat of the potential hazards generated as a result of the implementation of the IP, and the expected degree of the impact on the habitat is as follows:

Table № 5.13

<i>Assessment of the degree of impact of the IP on habitat 91E0*</i>				
<i>Impact (degree)</i>	<i>Parameters</i>			
	<i>Total area</i>	<i>Species composition</i>	<i>Quality</i>	<i>Prospects</i>
Zero alternative	0	0	0	0
IP	0	0	0	0

**V.2.2 Expected impacts and level of influence on the on the animal species subject to conservation in the PA BG0000533 "Kozloduy Islands" and included in Annex II to Directive 92/43/EEC.**

**V.2.2.1 Mammals included in Annex II of Directive 92/43/EEC**

**–1355 European Otter (*Lutra lutra*, Linnaeus, 1758).**

The IP area is not a habitat of the species (does not affect water bodies) and is located at more than 4 km (on the other side of the NPP) from its habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution both in the protected area and outside of it during each of the stages (construction, commissioning, operation, decommissioning) of implementation of the investment proposal.

**General impact on the species of mammals according to the impact level assessment matrix:**

Table No 5.14

<i>Species</i>	<i>Impact level assessment</i>	
<b><i>MAMMALS IN THE PA BG0000533</i></b>		
1355 European Otter ( <i>Lutra lutra</i> )	0	No impact

**V.2.2.2 Herpetofauna listed in Annex II to Directive 92/43/EEC**

**AMPHIBIANS.**

**–1188. Fire-bellied toad (*Bombina bombina*).**

The IP area is not a habitat of the species and is located at more than 4 km (on the other side of the NPP) from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution both in the protected area and outside of it during each of the stages (construction, commissioning, operation, decommissioning).

– 1993 Danube crested newt (*Triturus dobrogicus*).

The IP area is not a habitat of the species (does not affect standing water bodies, slow flowing rivers and canals) and is located at more than 4 km from its potential habitats in the protected area. The species has not been found within the protected area in recent years.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of AMPHIBIANS according to the impact level assessment matrix:**

Table No 5.15

<i>Species</i>	<i>Impact level assessment</i>	
<b>AMPHIBIANS IN THE PA BG0000533</b>		
1188 Fire-bellied toad ( <i>Bombina bombina</i> )	0	No impact
1993 Danube crested newt ( <i>Triturus dobrogicus</i> )	0	No impact

REPTILES.

– 1220. European pond terrapin (*Emys orbicularis*).

The IP area is not a habitat of the species (no water bodies) and is located at more than 4 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of REPTILES according to the impact level assessment matrix:**

Table No 5.16

<i>Species</i>	<i>Impact level assessment</i>	
<b>REPTILES IN THE PA BG0000533</b>		
1220 European pond terrapin ( <i>Emys orbicularis</i> )	0	No impact

#### V.2.2.3 Ichthyofauna listed in Annex II to Directive 92/43/EEC

##### – 4125 Black sea shad (*Alosa immaculata*).

The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

##### – 1130. Aral asp (*Aspius aspius*).

The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

##### – 2533 Balkan Loach (*Cobitis elongata*).

The IP area is not a habitat of the species and is located at more than 4 km from the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established. In the protected area there are no habitats suitable for the species. Due to this the species is proposed for exclusion from the standard form.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1149. Spined loach (*Cobitis elongatoides* = *Cobitis taenia*).

The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 2484 Ukrainian brook lamprey (*Eudontomyzon mariae*).

The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area. Not found during the field surveys in the area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1124 White-finned gudgeon (*Gobio albipinnatus*).

The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

–2555 Balon's Ruffe (*Gymnocephalus baloni*).

The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established and due to the impossibility to be registered during the mapping the category of the species in the standard form has been amended from R (rare) to P (present population).

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

–1157 Striped Ruffe (*Gymnocephalus schraetzer*). Found in permanent large rivers. The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).



–1145. Mud loach (*Misgurnus fossilis*).

The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area. The species is included in the Standard form for the area but was not found during the field surveys executed.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

–2522 Knife (*Pelecus cultratus*).

The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established and due to the impossibility to be registered during the mapping the category of the species in the standard form has been amended to P – presented. Its population has been amended to D – insignificant.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

–1134. European bitterling (*Rhodeus amarus*).

The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1146 Goldside Loach (*Sabanejewia aurata*).

The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1160 Streber (*Zingel streber*).

The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1159 Zingel (*Zingel zingel*).

The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of fish according to the impact level assessment matrix:**

Table No 5.17

Species	Impact level assessment	
<b>FISH IN THE PA BG0000533</b>		
4125 Black sea shad ( <i>Alosa immaculata</i> )	0	No impact
1130 Aral asp ( <i>Aspius aspius</i> )	0	No impact
2533 Balkan Loach ( <i>Cobitis elongata</i> )	0	No impact
1149 Spined loach ( <i>Cobitis taenia</i> )	0	No impact
2484 Ukrainian brook lamprey ( <i>Eudontomyzon mariae</i> )	0	No impact
1124 White-finned gudgeon ( <i>Gobio albipinnatus</i> )	0	No impact
2555 Balon's Ruffe ( <i>Gymnocephalus baloni</i> )	0	No impact
1127 Striped Ruffe ( <i>Gymnocephalus schraetzer</i> )	0	No impact
2522 Knife ( <i>Pelecus cultratus</i> )	0	No impact
1145 Mud loach ( <i>Misgurnus fossilis</i> )	0	No impact
1134 European bitterling ( <i>Rhodeus sericeus amarus</i> )	0	No impact
1146 Goldside Loach ( <i>Sabanejewia aurata balcanica</i> )	0	No impact
1160 Streber ( <i>Zingel streber</i> )	0	No impact
1159 Zingel ( <i>Zingel zingel</i> )	0	No impact

#### V.2.2.4 Invertebrates included in Annex II of Directive 92/43/EEC

##### – 1032 Thick shelled river mussel (*Unio crassus*)

The IP area is not a habitat of the species and is located at more than 4 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

##### – 1083 Stag Beetle (*Lucanus cervus*).

The IP area is not a habitat of the species and is located at more than 4 km from the protected area. No suitable habitats for the species were found during the executed surveys. As a result of the survey the species has been proposed for exclusion from the standard form of the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0).

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of INVERTEBRATES according to the impact level assessment matrix:**

Table No 5.18

<i>Species</i>	<i>Impact level assessment</i>	
<b><i>INVERTEBRATES IN THE PA BG0000533</i></b>		
1032 Thick shelled river mussel ( <i>Unio crassus</i> )	0	No impact
1083 Stag Beetle ( <i>Lucanus cervus</i> )	0	No impact

**V.2.3 Expected impacts and level of influence on the animal species subject to conservation in PA BG0000614 "Ogosta River", included in Annex II of Directive 92/43/EEC.**

**V.2.3.1 Mammals included in Annex II of Directive 92/43/EEC.**

**–1355 European Otter (*Lutra lutra*, Linnaeus, 1758).**

The IP area is not a habitat of the species (does not affect water bodies) and is located at more than 5 km from its habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution both in the protected area and outside of it during each of the stages (construction, commissioning, operation, decommissioning) of implementation of the investment proposal.

**–2609. Romanian Hamster (*Mesocricetus newtoni*, Linnaeus, 1766).**

The IP area is not a habitat of the species (does not affect steppes and agricultural areas) and is located at more than 5 km from its potential habitats in the protected area. The species has not been found within the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution both in the protected area and outside of it during each of the stages (construction, commissioning, operation, decommissioning).

– 1335. European souslik (*Spermophilus citellus*, Linnaeus, 1766).

The IP area is not a habitat of the species (does not affect open non-arable grasslands) and is located at more than 5 km from its potential habitats in the protected area. The species has been found within the protected area at more than 5.5 km on the other side of the Harlets village.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution both in the protected area and outside of it during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of mammals according to the impact level assessment matrix:**

Table No 5.19

<i>Species</i>	<i>Impact level assessment</i>	
<b>MAMMALS IN THE PA BG0000614</b>		
1355 European Otter ( <i>Lutra lutra</i> )	0	No impact
2609 Romanian Hamster ( <i>Mesocricetus newtoni</i> )	0	No impact
1335 European souslik ( <i>Spermophilus citellus</i> , <i>Citellus citellus</i> )	0	No impact

V.2.3.2 Herpetofauna listed in Annex II to Directive 92/43/EEC.

AMPHIBIANS.

– 1188. Fire-bellied toad (*Bombina bombina*).

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area. The closest established site is the mouth of the Ogosta River at more than 8 km from the surveyed area (BESHKOV, NANEV (2002)).

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).



*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution both in the protected area and outside of it during each of the stages (construction, commissioning, operation, decommissioning).

– 1171 Southern crested newt (*Triturus karelinii*).

The IP area is not a habitat of the species (does not affect swamps, lakes, big puddles, etc.) and is located at more than 5 km from its potential habitats in the protected area. The species has not been found within the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1193 Yellow-bellied toad (*Bombina variegata*).

The IP area is not a habitat of the species (does not affect swamps, lakes, big puddles, etc.) and is located at more than 5 km from its potential habitats in the protected area. The species has not been found within the protected area in recent years. The closest established site is south from the village of Butan, at over 10 km from the surveyed area (BESHKOV, NANEV (2002)).

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1993 Danube crested newt (*Triturus dobrogicus*).

The IP area is not a habitat of the species (does not affect standing water bodies, slow flowing rivers and canals) and is located at more than 5 km from its potential habitats in the protected area. The species has not been found within the protected area in recent years. The

closest established site is the mouth of the Ogosta River at more than 8 km from the surveyed area (BESHKOV, NANEV (2002)).

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of AMPHIBIANS according to the impact level assessment matrix:**

Table No 5.20

<b>SPECIES AMPHIBIANS IN THE PA BG0000614</b>	<b>Impact level assessment</b>	
1188 Fire-bellied toad ( <i>Bombina bombina</i> )	0	No impact
1171 Southern crested newt ( <i>Triturus karelinii</i> )	0	No impact
1193 Yellow-bellied toad ( <i>Bombina variegata</i> )	0	No impact
1993 Danube crested newt ( <i>Triturus dobrogicus</i> )	0	No impact

REPTILES.

– Blotched snake (*Elaphe sauromates*).

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area. The species has not been found within the protected area in recent years. The closest established site is the mouth of the Ogosta River at more than 8 km from the surveyed area (BESHKOV, NANEV (2002)).

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1220. European pond terrapin (*Emys orbicularis*).

The IP area is not a habitat of the species (no water bodies) and is located at more than 5 km from its potential habitats in the protected area. The closest established site is south from the village of Butan, at more than 10 km from the surveyed area (BESHKOV, NANEV (2002)).

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1217 Hermann's tortoise (*Testudo hermanni*)

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area. The closest established site is south from the village of Butan, at more than 10 km from the surveyed area (BESHKOV, NANEV (2002)).

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of REPTILES according to the impact level assessment matrix:**

Table No 5.21

<i>Species</i>	<i>Impact level assessment</i>	
<b><i>REPTILES IN THE PA BG0000614</i></b>		
1220 European pond terrapin ( <i>Emys orbicularis</i> )	0	No impact
5194 Blotched snake ( <i>Elaphe sauromates</i> )	0	No impact
1217 Hermann's tortoise ( <i>Testudo hermanni</i> )	0	No impact

V.2.3.2 Ichthyofauna listed in Annex II to Directive 92/43/EEC.

– 4125 Black sea shad (*Alosa immaculata*).

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area. The species has not been found within the protected area in recent years.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1130. Aral asp (*Aspius aspius*).

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0).

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1138 Mediterranean barbel (*Barbus meridionalis*)

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 2533 Balkan Loach (*Cobitis elongata*)

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1149. Spined loach (*Cobitis elongatoides* = *Cobitis taenia*).

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 2484 Ukrainian brook lamprey (*Eudontomyzon mariae*)

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1124 White-finned gudgeon (*Gobio albipinnatus*).

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)



*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 2555 Balon's Ruffe (*Gymnocephalus baloni*).

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1157 Striped Ruffe (*Gymnocephalus schraetzer*) Found in constant flowing large rivers. The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1145. Mud loach (*Misgurnus fossilis*).

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 2522 Knife (*Pelecus cultratus*).

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1134. European bitterling (*Rhodeus amarus*).

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1146 Goldside Loach (*Sabanejewia aurata*).

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1160 Streber (*Zingel streber*).

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1159 Zingel (*Zingel zingel*).

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of fish according to the impact level assessment matrix:**

Table No 5.22

<i>Species</i>	<i>Impact level assessment</i>	
<b><i>FISH IN THE PA BG0000614</i></b>		
4125 Black sea shad ( <i>Alosa immaculata</i> )	0	No impact
1130 Aral asp ( <i>Aspius aspius</i> )	0	No impact
1138 Mediterranean barbel ( <i>Barbus meridionalis</i> )	0	No impact
2533 Balkan Loach ( <i>Cobitis elongata</i> )	0	No impact
1149 Spined loach ( <i>Cobitis taenia</i> )	0	No impact
2484 Ukrainian brook lamprey ( <i>Eudontomyzon mariae</i> )	0	No impact

1124 White-finned gudgeon ( <i>Gobio albipinnatus</i> )	0	No impact
2555 Balon's Ruffe ( <i>Gymnocephalus baloni</i> )	0	No impact
1127 Striped Ruffe ( <i>Gymnocephalus schraetzer</i> )	0	No impact
2522 Knife ( <i>Pelecus cultratus</i> )	0	No impact
1145 Mud loach ( <i>Misgurnus fossilis</i> )	0	No impact
1134 European bitterling ( <i>Rhodeus sericeus amarus</i> )	0	No impact
1146 Goldside Loach ( <i>Sabanejewia aurata balcanica</i> )	0	No impact
1160 Streber ( <i>Zingel streber</i> )	0	No impact
1159 Zingel ( <i>Zingel zingel</i> )	0	No impact

#### V.2.3.3 Invertebrates included in Annex II of Directive 92/43/EEC.

- 1032 Thick shelled river mussel (*Unio crassus*) – Inhabits the clear running rich in oxygen water zone of rivers and streams with riverbeds covered with small gravel or sand. This species is very sensitive to eutrophication.

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

- 4011 Bolbelasmus unicornis (*Bolbelasmus unicornis*)

The IP area is not a habitat of the species. As a result of the latest surveys **the species was suggested for exclusion from the standard form of the protected area.**

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

- 1083 Stag Beetle (*Lucanus cervus*).

The IP area is not a habitat of the species and is located at more than 5 km from the protected area. During the executed surveys worse presentation of the species than reflected in the

standard form has been established. During the executed surveys worse presentation of the species than reflected in the standard form has been established as well as reasonable doubt that the species inhabits the area since there are no suitable conditions for the development of its larvae.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

–1089 *Morimus funereus* (*Morimus asper funereus*)

The IP area is not a habitat of the species and is located at more than 5 km from the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established as well as reasonable doubt that the species inhabits the area since there are no suitable conditions for the development of its larvae.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

–1087. *Rosalia longicorn* (*Rosalia alpine*)

The IP area is not a habitat of the species. As a result of the latest surveys **the species was suggested for exclusion from the standard form of the protected area.**

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).



–4064 Striped nerite (*Theodoxus transversalis*)

The IP area is not a habitat of the species and is located at more than 5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of INVERTEBRATES according to the impact level assessment matrix:**

Table No 5.23.

<i>Species</i>	<i>Impact level assessment</i>	
<b><i>INVERTEBRATES IN THE PA BG0000614</i></b>		
1032 Thick shelled river mussel ( <i>Unio crassus</i> )	0	No impact
1088 Great capricorn beetle ( <i>Cerambyx cerdo</i> )	0	No impact
1083 Stag Beetle ( <i>Lucanus cervus</i> )	0	No impact
1089 Morimus funereus ( <i>Morimus funereus</i> )	0	No impact
1087 Rosalia longicorn ( <i>Rosalia alpine</i> )	0	No impact
4064 Striped nerite ( <i>Theodoxus transversalis</i> )	0	No impact

**V.2.4 Expected impacts and level of influence on animal species subject to conservation in the PA BG0000508 "Skat River", included in Annex II of Directive 92/43/EEC.**

**V.2.4.1 Mammals included in Annex II of Directive 92/43/EEC.**

–1355 European Otter (*Lutra lutra*, Linnaeus, 1758).

The IP area is not a habitat of the species (does not affect water bodies) and is located at more than 6.5 km from its habitats in the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established. The assessment on the Population size and density compared to the populations in the entire territory of the country has been amended from (C) 2%  $\geq p > 0\%$  to (D) insignificant population due to the too low numbers of the European Otter in this area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution both in the protected area and outside of it during each of the stages (construction, commissioning, operation, decommissioning) of implementation of the investment proposal.

– 2609. Romanian Hamster (*Mesocricetus newtoni*, Linnaeus, 1766).

The IP area is not a habitat of the species (does not affect steppes and agricultural lands) and is located at more than 6,5 km from its potential habitats in the protected area. The species has not been found within the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution both in the protected area and outside of it during each of the stages (construction, commissioning, operation, decommissioning).

– 1316. Long-fingered bat (*Myotis capaccinii*, Bonaparte, 1837).

The IP area is not a habitat of the species (does not affect karst areas and caves as well as water bodies) and is located at more than 6.5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution both in the protected area and outside of it during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of mammals according to the impact level assessment matrix:**

Table No 5.24

<i>Species</i>	<i>Impact level assessment</i>	
<b>MAMMALS IN THE PA BG0000508</b>		
1355 European Otter ( <i>Lutra lutra</i> )	0	No impact
2609 Romanian Hamster ( <i>Mesocricetus newtoni</i> )	0	No impact
1316. Long-fingered bat ( <i>Myotis capaccinii</i> )	0	No impact

V.2.4.2 Herpetofauna listed in Annex II to Directive 92/43/EEC.

AMPHIBIANS.

– 1188. Fire-bellied toad (*Bombina bombina*).

The IP area is not a habitat of the species and is located at more than 6.5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution both in the protected area and outside of it during each of the stages (construction, commissioning, operation, decommissioning).

– 1993 Danube crested newt (*Triturus dobrogicus*).

The IP area is not a habitat of the species (does not affect standing water bodies, slow flowing rivers and canals) and is located at more than 6.5 km from its potential habitats in the protected area. The species has not been found within the protected area in recent years.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of AMPHIBIANS according to the impact level assessment matrix:**

Table No 5.25

<i>Species</i>	<i>Impact level assessment</i>	
<b>AMPHIBIANS B PA BG0000508</b>		
1188 Fire-bellied toad ( <i>Bombina bombina</i> )	0	No impact
1993 Danube crested newt ( <i>Triturus dobrogicus</i> )	0	No impact

REPTILES.

– Blotched snake (*Elaphe sauromates*).

The IP area is not a habitat of the species and is located at more than 6.5 km from its potential habitats in the protected area. The species has not been found within the protected area in recent years.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1220. European pond terrapin (*Emys orbicularis*).

The IP area is not a habitat of the species (no water bodies) and is located at more than 6.5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1217 Hermann's tortoise (*Testudo hermanni*).

The IP area is not a habitat of the species and is located at more than 6.5 km from its potential habitats in the protected area. No representatives were found in the area. A change in the standard form has been proposed - the population size and density compared to the populations in the entire territory of the country has been amended to (D) insignificant population. The change is a result of the more detailed surveys performed during the mapping project.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of REPTILES according to the impact level assessment matrix:**

Table No 5.26.

<i>Species</i>	<i>Impact level assessment</i>
<b>REPTILES PA BG0000508</b>	

1220 European pond terrapin ( <i>Emys orbicularis</i> )	0	No impact
Blotched snake ( <i>Elaphe sauromates</i> )	0	No impact
1217 Hermann’s tortoise ( <i>Testudo hermanni</i> )	0	No impact

V.2.4.3 Ichthyofauna listed in Annex II to Directive 92/43/EEC.

– 1138 Mediterranean barbel (*Barbus meridionalis*).

The IP area is not a habitat of the species and is located at more than 6.5 km from its habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don’t expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

1149. Spined loach (*Cobitis elongatoides* = *Cobitis taenia*).

The IP area is not a habitat of the species and is located at more than 6.5 km from its habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don’t expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1122 Danube gudgeon (*Gobio uranoscopus*)

The IP area is not a habitat of the species and is located at more than 10 km from its potential habitats in the protected area. The species was not found during the field visits. A change in the species category from R (rare) to V (vulnerable) has been proposed. The previous standard from lists the population as C which does not reflect the present condition and has been corrected to D (insignificant population).

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).



*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

–1134. European bitterling (*Rhodeus amarus*).

The IP area is not a habitat of the species and is located at more than 6.5 km from its habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of fish according to the impact level assessment matrix:**

Table No 5.27.

<i>Species</i>	<i>Impact level assessment</i>	
<b><i>FISH IN THE PA BG0000508</i></b>		
1138 Mediterranean barbel ( <i>Barbus meridionalis</i> )	0	No impact
1149 Spined loach ( <i>Cobitis taenia</i> )	0	No impact
1122 Danube gudgeon ( <i>Gobio uranoscopus</i> )	0	No impact
1134 European bitterling ( <i>Rhodeus sericeus amarus</i> )	0	No impact

V.2.4.4 Invertebrates included in Annex II of Directive 92/43/EEC.

–1032 Thick shelled river mussel (*Unio crassus*

The IP area is not a habitat of the species and is located at more than 6.5 km from its potential habitats in the protected area.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

1083 Stag Beetle (*Lucanus cervus*).

The IP area is not a habitat of the species and is located at more than 6.5 km from the protected area. During the executed surveys worse presentation of the species than reflected in the standard form has been established. According to the data the share of the national population of the species in the area is close to zero. The size of the population found in the protected area in relation to the species national population has been amended to (D) insignificant population.

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

– 1087. Rosalia longicorn (*Rosalia alpine*)

The IP area is not a habitat of the species. **As a result of the latest survey the species was proposed for exclusion from the standard from of the protected area.**

*Direct disturbance, loss of species habitats, barrier effect* – The species has no habitat on the territory of the IP. No impact expected on the habitats or barrier effect (score 0).

*Direct destruction of species representatives* – No impact expected (score 0).

*Disruption during the construction* – The species is not found on the territory of the IP. No impact expected (score 0).

*Disruption of bio corridors* – No permanent migration corridors have been established which could be affected by the investment proposal (score 0)

*Fragmentation* - No impact expected (score 0).

We don't expect the implementation of the IP to impact the species distribution in the protected area during each of the stages (construction, commissioning, operation, decommissioning).

**General impact on the species of INVERTEBRATES according to the impact level assessment matrix:**

Table No 5.28.

<i>Species</i>	<i>Impact level assessment</i>	
<b><i>INVERTEBRATES IN THE PA BG0000508</i></b>		
1032 Thick shelled river mussel ( <i>Unio crassus</i> )	0	No impact
1083 Stag Beetle ( <i>Lucanus cervus</i> )	0	No impact
1087 Rosalia longicorn ( <i>Rosalia alpine</i> )	0	No impact

**V.3 Description and analysis of the Investment Proposal impact upon the integrity of the protected areas in terms of their structure, functions and nature conservation goals (loss of habitats, fragmentation, disturbance of the species, violation of the species composition, chemical, hydrologic and geologic changes, etc.), both during the construction and operation and closure of the Investment Proposal components.**

**V.3.1 Expected direct impacts.**

**V.3.1.1 Destruction (loss) of habitats as a result of the utilization of areas - % of the affected territories of the protected areas and the respective types of habitats in them, change in the “population” structure.**

“Radiana” site stands at 0.45 km from “Zlatiyata” PA BG0002009, at 3.8 km from “Kozloduy Islands” PA BG0000533, at 6.0 km from “Ogosta River” PA BG0000614, at 6.3 km from “Skat River” PA BG0000508 in a straight line distance and the construction facilities envisaged within its range are even more remote, therefore the realization of the IP is not related to utilization or taking away of areas within the protected areas. The realization of the IP will be connected with the construction of only 18.75 % of the territorial coverage of the site – as a result of the construction of the repository, the servicing buildings and adjacent infrastructure at an area amounting to a total of 87 ha, while 81.25 % or 377 ha are envisaged for planting and undisturbed zones. As a whole the IP also does not affect conservationally significant or valuable for the various species habitats outside the protected areas.

**In this case after the construction and commissioning of NRRAW it can be expected that:**

- i. Regarding the habitats subject to protection within the nearest protected areas and the habitats of the target animal species within them:*
  - their natural areal and the territories covered by this areal will remain unchanged within the considered protected areas;
  - the specific structure and functions, which are necessary for their long-term maintenance and future existence will not be directly damaged as a result of taking out of areas, they will be kept and it is expected to continue existing in the foreseeable future within the considered protected areas;
  - the state of preservation of the typical species and their conservational status will remain at their current level within the considered protected areas;
- ii. Regarding the animal species subject of protection:*
  - The reported populations of the respective target species will persist in the long term as a viable elements in their natural habitats on the territory of the considered protected areas;
  - The natural areal of the species will not be reduced, nor it is likely to be reduces in the foreseeable future;
  - A sufficiently big area of the habitats in the protected areas will continue to exist in the long-term in order to maintain the populations of the target species attached to them;

**Figure I-3** in the paper and **Annex 3** to it shows a satellite picture on which is outlined the location of the IP components in relation to “Zlatiyata” PA BG0002009 declared under Directive 2009/147/EC on the conservation of wild birds and “Kozloduy Islands” PA BG0000533, “Ogosta River” PA BG0000614, and “Skat River” PA BG0000508 declared under Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna.

#### V.3.1.2 Functions and conservation objectives

The investment proposal does not fall within the territory of the protected areas and is not neighbouring such. Insignificant indirect impacts on the natural functioning of single elements in the immediate adjacent territories of “Radiana” site, which also do not fall within protected areas, can be expected, and in regards to “Zlatiyata” PA BG0002009 the potential impacts will be restricted to the republican road II -11 Kozloduy – Hurlets – Mizia, at about 450 m beyond which is located the protected area. In this respect, it is not expected the realization of the site to impact in any way the functions and conservation goals of the nearest PA.

#### V.3.1.3 Fragmentation.

Having in mind that “Radiana” site does not fall within Natura 2000 protected areas and is not neighbouring such, the activities within its boundaries are not in the condition to cause fragmentation of plant communities and natural habitats of target animal species within the nearest areas. The transportation of RCC with RAW from their packaging unit situated at Kozloduy NPP site near the repository is also not related to crossing PA and respectively to territorial fragmentation of such. No serious additional preconditions can be created to hinder the movement of target land animal species and birds among the territories of the different areas in the region, given the planned density of construction and the project height of the repository and the servicing premises (one- to two-storey buildings). As it was mentioned above, the land surface areas necessary to realize the IP through construction amount to 87 ha, on which will be located the repository, the servicing buildings and the adjacent infrastructure, while 377 ha of the territorial coverage of “Radiana” site are envisaged for planting and undisturbed zones. It is also necessary to point out that there cannot be any interruption of bio corridors of land animal species as a result of potential additional fragmentation of the territory located between “Kozloduy Islands” PA and “Ogosta River” PA respectively and “Skat River” PA (outside the possible one by Kozloduy NPP, the settlements and roads in the region) due to the realization of NRRRAW, given the fragmenting role of the water mirror of the Danube River regarding the islands situated in it. With respect to fish and reptiles subject of protection in these areas, there is also no possibility of fragmentation of habitats and interruption of bio corridors among the zones, since the mentioned animal groups can freely move in the water environment (both fish and amphibians) connecting the rivers in the region, as well as along their coasts (amphibians only).

No preconditions can be created to hinder the movement of birds between “Zlatiyata” PA and the other free territories in the region. This conclusion can be drawn not only due to the planned low building, but also due to the fact that as a whole habitat fragmentation for birds is not so clearly expressed as with the slow moving animals such as reptiles, amphibians and crawling invertebrates, as well as some mammals (excluding bats) because birds mainly use the air to move at great distances. Similar conclusion can also be drawn for the flying insects.

#### V.3.1.4 Mortality rates (destruction of species).

The establishment of the site is not related to direct destruction of plants included in Annex 2 of LB and of Directive 92/43/EEC for the habitats due to the lack of such plants in the region.

In the realization of NRRRAW as a result of the establishment of its zones and the construction of the facilities installations, and buildings within them, exists only low risk of mortality of separate individuals of some animal species and birds, included in Annex II of Directive 92/43/EEC and Annex I of Directive 79/409/EEC and subject to protection in the considered protected areas, mainly as a result of sporadic occurrence of such individuals in the region of the construction sites when it is possible to overrun or bury with soil mainly

disoriented juveniles, to destroy nests with eggs or less mobile soon hatched chicks. In this case it is related to the destruction only of separate individuals outside their habitats in the areas, and not of the entire local populations of the affected species, with such a risk existing in regards to some species at a much higher rate during the processing of the arable lands in the region, also typical for any kind of construction outside the settlements, and as a result of the road traffic in the region, etc. In the case with the repository the habitats of the species in the areas remain unaffected, which is a precondition for recovering the possible minimum losses in the region in the foreseeable future. It is necessary to point out, that the destruction of individuals from target species can occur mainly in the period of construction, and this risk may be prevented through the application of some mitigation and preventive measures set in RADI. For example, if the construction is to start during the breeding season of the target bird species nesting in forest habitats, the Contracting Authority should provide tour of the terrain from experts with knowledge in the field of avifauna, who can establish the presence or lack of nests and when such are registered, to undertake the necessary “saving” measures by relocating them to similar biotopes at safe distance, and if this is impossible – to postpone the beginning of the construction stage until the breeding period is over, and if necessary until the autumn migration. Thus if this recommendation, which is also set in the measures in this paper, is followed no mortality of separate individuals from the target bird species subject to protection is expected.

On the other hand, if on the envisaged for surface construction areas are present feeding adult vertebrae immediately before the construction activities, they will leave the territory themselves due to the disturbance caused by the executed preliminary preparatory works – noise from the placement of heavy construction-assembly machines, the coming of work personnel, etc.

In this paper an independent analyses and assessment of the IP impact for each protected species separately, which also includes the possibility of individual mortality in the perimeter of impact, is carried out in the previous sections 5.1 and 5.2.

#### V.3.1.5 Disturbance of the species.

During construction, operation and closure can be expected disturbance only of separate individuals of some of the target bird species, which use both the site and its neighbouring adjacent territories outside the protected areas for feeding and rest. Human presence during site construction and operation will be only on the terrain of the designated site. It will be approached by people and machinery from the internally used road of Kozloduy NPP, i.e. from the opposite side of the nearest situated protected area – “Zlatiyata” BG0002009 under Directive 2009/147/EC. The transport of the RAW packages from the treatment, conditioning and packaging installation at the NPP site will also be from the opposite to the protected area side of “Radiana” site. The nearest distance between the site and this protected area is about 450 m, while the actual construction and operation activities will be performed at operational sites situated at about 500 m (the external border of the site does not coincide with the borders of the area subject to construction). The displacement between the nearest border of the protected area and the construction site is from 10 m to 20 m with the gradient of the slope being in a direction opposite to the nearest border of the protected area (i.e. the area is at a higher level), which additionally hinders the distribution of noise from workers and construction equipment towards the PA. As a result, the increased noise impact above the natural background noise in the region will not be more than 300 m (as is shown in *Table 3.2* in section 3) and it will not be a factor of disturbance for the birds living on the territory of the protected area. In this sense **there is no contradiction with its protection purposes** as formulated in the order declaring it. In practice, the disturbance factor during the realization of



the IP will be of local and limited nature at the site itself and up to about 300 m from it and it will not affect the integrity (which precisely is subject of consideration in this section) of the protected areas considered in this paper. Therefore, the territory covered by the nearest PA “Zlatiyata” will not be fragmented into separate parts the access among which is ceased or hindered due to their disturbance at certain locations within the parameter of the area, and the analogical deduction can be drawn for the remaining areas. Hence, can be drawn the conclusion that the structure and functions of the areas and habitats in them will not suffer changes as a result of disturbance caused by the IP realization and these structure and functions will keep their current parameters regarding the disturbance factor. In addition, outside the issues, related with the essence of this section, regarding the individuals of some bird species, subject to protection in “Zlatiyata” PA, which is possible to visit the planted territory of the IP site outside the area, it should be taken into account that they should have already adapted and acquired certain resistance to disturbance caused by various types of factors related to noise, the presence of people and the like, since the site is located next to the industrial complex of Kozloduy NPP, which is a significant source of noise pollution in the region, and at the same time along the entire northern and southern border of the planted territory also pass two of the central roads in the region – regional road II-11 Kozloduy-Hurlets-Mizia and the NPP internal road connecting the power plant with the town of Kozloduy, and the road mentioned before – the territory is actually enclosed by them. Besides, in the last years the terrain of the site itself is almost constantly subjected to different types of extensive studies related to drilling activities, regular surveillance of already established drilling monitoring points, pre-investment studies of the terrain, including such related to geodetic surveying of the existing infrastructure facilities, geodetic measurements related to spatial determination of possible future construction and the like, which is inevitably related to significant increase of human presence and noise generated by the use of technical equipment (drills, vehicles, etc.) in the area covered by the IP, as well as in the vicinity. It is also necessary to take into consideration that in 2013 the purpose and manner of permanent use (MPU) of the land covered by “Radiana” site were changed from MPU as “Forests in arable lands” to MPU “Other settlement territory” with a statement of MAF with exit № 91-800/10.05.13 (*Appendix 3.3*).

#### V.3.1.6 Violation of the species composition.

There is no possibility for natural and rooted plant communities to be affected as a result of the investment proposal realization, since on the surface will be cleared an area of artificially planted acacia, which is a species introduced to our latitudes and it has a somewhat invasive nature. Besides acacia on the site can be found other introduced species such as gleditsia (*Gleditschia triacanthos*) and sophora (*Sophora japonica*). Some ruderal invasive grass species will temporary invade only the violated parts of the site during construction, the humus depots and the excavated land masses, and there is a risk that thereafter they can also settle in the subsequently planted areas. For the biological re-cultivation of the repository after its final closure will probably be used mainly tree and bush species, which are currently part of the vegetation cover of the site and its neighbouring terrains, and therefore no increase of the risk of introducing new species to the nearest PA is expected compared to the currently existing risk.

No impact is expected on habitats and populations of species subject to protection in the protected areas in the region of the investment proposal.

During the IP realization a plant community of derivative anthropogenic nature without significant conservation value will be affected. As a result the species composition will be somewhat changed but only within “Radiana” site as a result of the biological re-cultivation and envisaged planting events and after the final closure of the repository.

No violation is expected of the habitats of animal species subject to protection in the areas, as well as no impact on the actual local populations, related to invasion of new untypical for the region species and respectively no violation of the species composition, since the IP is not related to animal breeding activities. No habitats of conservationally significant species are violated.

**In conclusion, regarding the direct impact it is necessary to be said that the nature of the investment proposal and its location** (entirely outside the protected areas and standing at a sufficient distance from them) **exclude causing fragmentation and deterioration of the structure of local population of species, included in the subject of protection for “Zlatiyata” PA BG0002009, “Kozloduy Islands” PA BG0000533, “Ogosta River” PA BG0000614 and “Skat River” PA BG0000508. A slight increase of the anthropogenic pressure in the region as a whole can be expected but it is within the capacity of the formed ecosystems and therefore no special compensation measures are necessary.**

### *V.3.2 Expected indirect impacts.*

#### V.3.2.1 Potential deterioration of the habitats quality in PA and in their immediate vicinity as a result of chemical changes.

There will be no chemical changes in the environment, where the investment proposal is to be realized, since it is not related to chemical production leading to the generation of air flows polluted by various gasses and to the release of wastewater containing various chemical compounds and substances. The IP is also not related to the processing of mineral resources or to whatever significant emission of gas, solid or liquid organic and inorganic pollutants. The only potential cause of chemical pollution, and that is only within “Radiana” site, is related to accidental leakages and spills of fuel and lubricants as a result of failures in the used self-propelled machinery, mainly during construction. Besides, the quantity of the polluting fuels and lubricants will not be significant and the potential impact will be on a restricted area (outside the PA and the habitats in them), it will be temporary, short and sporadic – with slight probability and low frequency of occurrence, and therefore the impact is reversible if timely eliminated and in case the requirements regarding the rules and maintenance of the used machinery are followed, no such event will occur.

#### V.3.2.2 Potential deterioration of the habitats quality in PA and in their immediate vicinity as a result of possible radiation pollution.

There is no serious risk of excessive radiation pollution in the region of the site, and even less for the territories of the nearest Natura areas as a result of burying RAW in the repository and their subsequent storage in it. **This risk is already minimized at the stage of “sealing” the low and intermediate level radioactive waste in reinforced concrete containers. The type of radioactive waste subject to disposal is from Category 2a, pursuant to the *Ordinance on the safety of radioactive waste management*. According to the definition for Category 2a the maximum specific activity of the long-lived radionuclides in one package is  $\leq 4.0\text{E}+06$  Bq/kg and under the condition that the maximum average value for the long-lived radionuclides in the burial cells should not exceed  $4.0\text{E}+05$  Bq/kg. **In the case it is referred to:****

- liquid RAW subject to additional concentration through evaporation and to conditioning through cementing of cubes residue, as a result of treatment and concentration of different types of radioactive waters, resulting from the power plant operation, spent ion exchange resins and sorbents;

- solid RAW – polluted clothing and means for personal protection, polluted equipment and tools (including from the decommissioning of reactors), land masses, construction waste, laboratory waste from radionuclides used for scientific, medical and industrial purposes;

**The investment proposal is not related to treatment and disposal of spent nuclear fuel from the operation of Kozloduy NPP reactors or other NPPs, as well as of other RAW, falling outside the above-mentioned category.**

At NRRAW will be buried the waste processed and packed in TSPRAO. The recycling technologies used in TSPRAO are limited to: 1/ Cementing of cubes residue (liquid RAW); 2/ Extrusion of solid RAW; 3/ Packaging of cement mixture and solid waste in protective reinforced concrete containers (RCC). **They will be covered sources only of gamma ionizing radiation, since the package will eliminate the distribution of alpha and beta particles.** The containers are designed in such a way that the power of the equivalent dose of gamma radiation from one RAW package to be limited to 2 mSv/h at the surface and maximum 0.1 mSv/h at 1 m distance from the surface. **Under the law, weakening the power of the gamma dose equivalent to the square of the distance means that the calculated equivalent dose after a few more meters will be actually equal to the natural, i.e. in this case there is no whatsoever possibility for the nearest to “Radiana” site Natura 2000 protected areas and the natural habitats and the habitats of the species in them to be subject of radiation from the RCC** during their transportation to NRRAW. The consecutive burial of the packages in the facility cells through their closure and coverage with multilayer engineering barrier (including the previously laid loess-cement cushion below them) will completely neutralize the possibility of radioactive pollution of water, soil, air, geological environment and the elements of the biological diversity in the region as a result of gamma radiation, hence, there cannot be any deterioration of the habitats quality in the nearest PA as a result of secondary / indirect impacts of radioactive nature. This will also be facilitated by the systems servicing the repository – mainly the network for control and discharge of infiltrated waters and the network for deep drainages, which are described in the annotation. It should also be taken into account that as a technology the process of RAW storage at NRRAW is not related to the possibility of gas emissions in the ambient air.

#### V.3.2.3 Potential deterioration of the habitats quality in PA as a result of hydrologic and hydrogeological changes and violation of the water balance in the region.

“Radiana” site is not located within Natura 2000 protected areas and in the immediate vicinity of such and therefore the construction and operation of the repository and the servicing buildings on the site is not related to direct impact on hydrologic and hydrogeological conditions in the habitats in “Zlatiyata” PA BG0002009, “Kozloduy Islands” PA BG0000533, “Ogosta River” PA BG0000614 and “Skat River” PA BG0000508.

Through “Radiana” site and near it do not pass natural water flows and areas with standin waters (reservoirs, lakes, etc.), which can be affected by the NRRAW construction and therefore there is no risk of secondary / indirect impact on the hydrologic conditions of the habitats in the nearest PA that are connected to such water sites. The operation of the repository and the servicing buildings is not related to water abstraction from surface water bodies and respectively to impact on the water balance of the rivers flowing in “Ogosta River” PA and “Skat River” PA and the water formations near them.

The construction of the repository, the servicing buildings and the adjacent infrastructure will not be connected with significant hydrogeological changes in the geological environment of the region of the IP and even less of the nearest PA, since no significant in depth and scale excavation works are envisaged for the foundations of the facility and the buildings which can

reach the aquifers situated in the hydrogeological profile of “Radiana” site. In this respect it is not expected to affect the quantitative and qualitative features of the distributed groundwater bodies in the region, which are located most shallow at about 35÷50 m under the terrain surface and at about 15÷30 m under the lower elevation of NRRAW where is stated the upper layer of groundwater body “Pore Water at Neogene – Lom-Pleven Depression” under the code of BG1G00000N2034.

The nature of the considered investment proposal defines the necessity of only providing water for technical needs during construction and drinking water supply during operation to meet the needs of the personnel working in the servicing buildings. The disposal of the conditioned RAW containers in the repository does not require industrial water supply. In this case, water for technical needs during construction and for domestic-drinking purposes during exploitation will be provided along the existing water pipe that passes through “Radiana” site and which is part of the drinking water supply mains of Kozloduy NPP, which is supplied by three Ranney wells, situated on the terrace of the Danube River before the town of Kozloduy. These wells provide the backup water supply for the villages of Hurllets and Glozhene, as well as the supply of the above-mentioned pipeline that passes through the site, which will also supply the buildings servicing the repository. Water in the wells is collected from the water body “Pore water at Quaternary - Kozloduy Valley under the code of BG1G00000Qal005”. In this respect, an impact is expected on the quantity of the groundwater body as a result of additional water abstraction for domestic-drinking and construction needs of NRRAW from existing water abstraction systems and facilities outside the territory of the investment proposal site. As per the conclusions in REIA this impact will be direct, long-term and reversible with restricted territorial cover and of low magnitude in the established impact zone around the water abstraction facilities. It is evaluated as insignificant, since the water abstraction will be pursuant to the Water Act and its ordinances based on the respective water abstraction permits. Therefore, there is no danger of causing hydrogeological changes in the nearest to the wells PA – “Zlatiyata” PA BG0002009, “Kozloduy Islands” PA BG0000533 and “Ogosta River” PA BG0000614, including no tangible change in the flow of the present springs in the zones that are part of the draining system of groundwater body BG1G00000Qal005.

#### V.3.2.4 Potential deterioration of the habitats quality in PA as a result of possible water pollution in non-radiation and radiation aspect.

A separate sewerage system is to be constructed in the IP for “Radiana” site: for domestic-fecal waters and for rainwater. In addition, the following systems are to be provided for the flows, for which there is a potential risk, no matter how minimal, for radioactive pollution: “system for control and discharge of infiltrated water”, “system for liquid RAW”, “system for deep drainages”.

Domestic-fecal wastewater from the servicing buildings will be collected in the domestic water sewerage, which will be built on the site and will discharge in the domestic-fecal sewerage of Kozloduy NPP, the water from which is subject to treatment until reaching the legal requirements at a wastewater treatment plant (WWTP) for treating the domestic wastewater from the NPP and the plant treated water is discharged in the Danube river outside the boundaries of the protected areas in the region (after “Kozloduy Islands” PA). The wastewater flow from NRRAW will neither be a problem for the site sewerage system of Kozloduy NPP, nor for the plant treatment facilities, when they are working well. Thus the generated wastewater will not deteriorate the quality of surface and groundwater in the nearest Natura 2000 protected areas and in the region of the power plant as a whole both in non-radiation and radiation aspect. It should be pointed out here, that a separate system is envisaged (“system for liquid RAW”) to collect all potentially radioactive liquids from the deactivation showers, the premises for reception and temporary storage of containers with RAW, the



laboratories, the drainages in the controlled area, etc., which is completely independent from the domestic wastewater sewerage that will be servicing the general showers, sinks and restrooms. It is designed in such a way that the potentially radioactive wastewater generated during the usual operation in some of the premises in the servicing buildings to be discharged gravitally through draining pipelines into two reservoirs for storage, where water will be controlled through sampling, and depending on the level of radioactivity will be either transported in a mobile tank to Kozloduy NPP site for processing through concentration and conditioning, in case the liquid radioactivity is above the admissible threshold, and afterwards it will be buried in NRRAW, or it will be transferred to the nearest shaft of the rainwater sewerage, in case the liquid radioactivity is within the acceptable limits. Thus the potential radioactive pollution of water and soil above the limits in the region of the repository will be avoided and respectively no deterioration of the quality of the habitats in the considered protected areas can be expected as a result of secondary / indirect impacts resulting from release of liquid with high radioactivity into the environment.

Since there is some risk of water infiltration in the full and sealed cells of NRRAW as a result of failures related to permeation and occurrence of the capillarity phenomenon, a reliable "system for control and discharge of infiltrated water" is planned to be constructed in the repository platforms. This system is envisaged to be in operation during the stages of construction, operation and institutional control for a period of 300 years with minimum maintenance. It includes different types of pipes and pipelines, monitoring vessels placed on the pipes discharging water from the cells, a network of underground galleries for access, and a collective reinforced concrete control reservoir to collect the infiltrated water. The system allows easy detection and location of infiltrated water in the storage cells. The infiltrated water collected in the reservoir is subject to checks via sampling for radioactivity prior to being discharged. The radioactivity of the collected water should be below the determined limits for release. In case the determined limits are exceeded the water is subject to transportation outside the site in a specialized tank to be processed through concentration and conditioning in the licensed for the purpose installation at Kozloduy NPP site, and afterwards it will be packed and buried in NRRAW. If the radioactivity is below the admissible limits, then the water in the reservoir is to be discharged in the rainwater collecting reservoir. Thus the potential radioactive pollution of water and soil in the region of the repository will be avoided respectively no deterioration of the quality of the habitats in the considered protected areas can be expected as a result of secondary / indirect impacts resulting from release of radioactive infiltrated water from the facility cells into the environment.

In addition, for the collection and discharge of groundwater that may collect round the important underground constructions, such as the foundations of the RAW storage cells, a "system for deep drainages" is envisaged. It consists of underground horizontal permeable pipes installed upon a layer of filtering material, which provides way for the discharge of the drained groundwater and underground waters. The water collected in the pipe network is to be taken to a reservoir for deep drainages located next to the reservoir of the infiltration control system. Similar to the water collected in the infiltration reservoir, the water from the deep drainages reservoir will be controlled through sampling and depending on the level of the recorded radioactivity it will be either directly discharged into the rainwater reservoir or transferred to a mobile tank to be transported for further treatment through concentration and conditioning in the licensed for the purpose installation at Kozloduy NPP site, packing and burial in NRRAW. Thus the potential radioactive pollution of water and soil above the limits in the region of the repository will be avoided and respectively no deterioration of the quality of the habitats in the considered protected areas can be expected as a result of secondary / indirect impacts resulting from release of inadmissibly radioactive drainage water from the space around the important underground constructions into the environment.



In order to have controlled removal of the surface flow at “Radiana” site formed as a result of precipitation and reducing water infiltration through the soil to a minimum it is envisaged for the site to be encircled by an unconfined network for collecting rainwater. The network will consist of open channels from cast concrete, covered or not with steel grids, straight PVC or HDPE pipes, PVC pipes in the drainage and inspection galleries network, revision shafts, trenches and rainwater gutters, and a reservoir to collect this water. The rainwater collected in the reservoir is conditionally clean. Beside rainwater, it will also collect the water released from the reservoir of the system for infiltrated water control and from the reservoir for deep drainages, for which it is proven via sampling that their radioactivity is within the admissible limits for release. Notwithstanding, to maximally prevent a possible above the level radioactive pollution of the region caused by the water collected in the rainwater reservoir, it will also be sampled prior to its release in the sewerage system. Water can be released only if its radioactivity is below the admissible limits for release in the environment. In case that these limit values are exceeded, the water will be removed from the reservoir and transferred for treatment outside the repository site, i.e. to the licensed for the purpose installation at Kozloduy NPP site, which after being concentrated through evaporation and conditioning will be packed in RCC and buried in NRRAW. Thus the potential radioactive pollution of water and soil above the limits in the region of the repository will be completely avoided and respectively no deterioration of the quality of the habitats in the considered protected areas can be expected as a result of secondary / indirect impacts resulting from release of inadmissibly radioactive water from the NRRAW site during its operation and institutional control into the environment.

#### V.3.2.5 Potential deterioration of the habitats quality in PA as a result of geologic changes.

Since “Radiana” site is not located within Natura 2000 protected areas and in the immediate vicinity of such, and the realization of the repository, the servicing buildings and the adjacent infrastructure is not related to significant in depth and scale excavation works for laying the foundations of the facility and the buildings, there cannot be expected any geological changes in the geological environment of the nearest PA and respectively in the quality of the habitats found in them. As per the conclusion in the REIA the expected impact on the geological environment during the IP realization will be the mechanical disruption of the earth when preparing the construction site and the construction phases of NRRAW. This impact is unavoidable, direct, permanent and irreversible, with scope within the territory of the site and possibly part of the terrain around it (for temporary roads, excess soil depot, etc.), i.e. without affecting the earth in the protected areas or near them. In radioactive aspect no impact is expected on the earth during the operation and post-operation period (institutional control with 300 years duration) due to the fact that the envisaged high sorption features of the engineering barriers of the repository will provide long-term limitation for the migration of potentially released radionuclides from the RCC into the cells of the facility. Besides, an additional natural barrier is the geological environment itself, in which, in this case, the diffusion process is characterized by low speed regarding radioactive isotopes.

#### V.3.2.6 Potential deterioration of the habitats quality in PA as a result of piling of waste from inert materials outside the designated places and indiscriminate disposal of domestic waste.

The potential establishment of unauthorized landfills for inert materials generated during the construction of NRRAW outside the designated for this purpose landfills within “Radiana” site, mainly at spots at a higher distance from it, including illegal landfills for domestic waste generated by the construction and servicing staff, could lead to deterioration of the quality of

the environment in the region and respectively of the habitats in territories falling within Natura 2000 protected areas. If only the facilities envisaged in the project are used for this purpose and the Contracting authority and the staff comply with the requirements of the legislative base regarding waste management, there will be no risks related to deterioration of the conservational status of the habitats and the species in the protected areas nearest to the repository (NRRAW is not located within the PA). Considering the management way for the types of waste that is expected to be generated during construction, operation and the institutional control of the repository, which is described in Section I.5.8 in REIA, there will be no deterioration of the habitats quality in the PA as a result of pollution from different waste during the IP realization.

#### V.3.2.7 Increased risk of fire.

Given the nature and purpose of NRRAW related to reception, burial, and storage of low and intermediate level radioactive waste Category 2a pursuant to the Ordinance on the safety of radioactive waste management generated on the territory of Bulgaria, it is not expected to have a significant increase of the risk of fire in the region of the IP as a result of its realization. On the contrary, even some decrease of this risk can be expected, since the control in this respect within “Radiana” site is currently highly decreased compared to the control envisaged after the realization of the repository, since at present access to part of the site is not seriously hindered from the republican road II – 11 Kozloduy – Hurllets – Mizia on the south. All facilities, buildings, and installations that are part of the IP are planned to be equipped with fire protection systems and equipment designed in accordance with the Bulgarian and international European regulations, technical standards, norms, and laws. Regarding the enhancement of the fire safety of the site, its proximity to the Regional Service “Fire Safety and Protection of the Population” should be pointed out as a main advantage. The service works 24 hours a day and can reach the fire location on the site in up to 5 minutes.

Passive and active fire protection measures will be applied on the site.

The passive measures include provision of the respective class of functional fire hazard regarding each building and facility, provision of the respective category of functional fire hazard within the determined class regarding each building and facility, provision of the legally required level of fire resistance of the buildings and fire resistance of the constructive elements of the buildings, provision of the legally required classes of fire reaction of the products used for construction elements, building fire protection barriers (brandmauers and firewalls) to separate buildings, premises, and equipment of different class of functional fire hazard, establishing fire sectors, installing flue and heat installations, provision of routes for fire extinguishing activities, and other.

The active measures include installing fire alert systems with automatic activation in all premises and buildings (although it is not obligatory for all premises and buildings), installing a fire alert system with manual activation in all buildings (although it is not obligatory in the presence of the first system), siren type acoustic alert systems in all buildings, provision of different types of fire extinguishers in all fire hazardous premises and zones, incl. fire hose reels with frothers at some places, installing a net of hydrants to protect the facades of all buildings, providing independent external water supply for fire extinguishing purposes, providing independent internal water supply for fire extinguishing purposes and hose reel in almost all buildings (without the portal and the garages), a separate reservoir for water storage for fire extinguishing purposes and water supply, a system for water fog in the premises of the backup diesel generator, and other.

The application of the listed passive and active fire protection measures no increase in the risk of fire is expected in the region of NRRAW and in respect of the nearest PA, moreover that

the site and the reactor buildings of Kozloduy NPP are situated nearby, which presupposes the spreading of potentially occurred fires at “Radiana” site not to be allowed in its neighbouring territories.

V.3.2.8 Potential deterioration of the habitats quality and replacement of the species composition in PA as a result of replacement of the species composition in PA due to the invasion of foreign aggressive species.

There is no possibility for the species composition of the plant communities subject to protection in Natura 2000 protected areas to be affected as a result of replacement of naturally spread plant species due to the investment proposal realization, since anyway on the surface will be cleared an area with artificially planted acacia, which is a species introduced to our latitudes and it has a somewhat invasive nature. Besides acacia on the site can be found other introduced species such as gleditsia (*Gleditschia triacanthos*) and sophora (*Sophora japonica*). Clearing part of them from the sites envisaged for construction, may to some extension, however insignificant, play a restrictive role regarding the distribution of these species towards the PA nearest to “Radiana” site. Some ruderal invasive grass species will temporary invade only the violated parts of the site during construction, the humus depots and the excavated land masses, and there is a risk that thereafter they can also settle in the subsequently planted areas. For the biological re-cultivation of the repository after its final closure will probably be used mainly tree and bush species, which are currently part of the vegetation cover of the site and its neighbouring terrains, and therefore no increase of the risk of introducing new species to the nearest PA is expected compared to the currently existing risk.

No impact is expected on the species composition of the fauna living in the nearest PA related to invasion of new untypical for the region species, since the IP is not related to animal breeding activities.

V.3.2.9 Deterioration of the status of the animal species subject to protection in the PA as a result of destruction of food source in the region.

As a result of NRRRAW construction and operation 18.75 % of the territorial coverage of “Radiana” site will be utilized through construction – as a result of the construction of the repository, the service buildings, and the adjacent infrastructure on an area amounting to amounting to a total of 87 ha, while 81.25 % or 377 ha are envisaged for planting and undisturbed zones. The undisturbed zones and the adjacent terrains of the site will actually keep the existing functions of the habitats in the region, while the artificially planted areas will also be able to provide food source for the animal species distributed in this part of the country. Therefore, there is no risk of significant negative impact on the food source and feeding habitats of the animal species subject to protection in the nearest protected areas and that also feed in the neighbouring territories outside the PA. This risk is to be evaluated as insignificant since both within “Radiana” site and next to it there will be areas with sufficient food source. In this case of primary importance is that no habitats with food resources within the protected areas themselves are affected, since one of the purposes of establishing these areas is to provide sufficient food source for the species subject to protection.

V.3.2.10 Potential deterioration of the habitats quality in PA as a result of emergency situations and failures, which can cause radioactive pollution.

It is necessary to evaluate the possibility of failures and accidents in the repository and in some of the buildings, where the containers with waste will be received and processed, and

mainly those failures that can lead to damaging the construction integrity of the facility and the buildings, which can cause RCC to enter the environment and the surface of these containers and their content (in case the integrity of the containers is not intact) to be in a direct contact with water, soil and air and cause their local radioactive pollution. On one hand, respectively, there is a risk for this pollution to be transferred to the nearest protected areas and the habitats in them through the movement of groundwater and surface flow in time of precipitation, and on the other, there is a risk either directly to affect the species subject to protection that dwell in the areas and in the region of the repository, or to be indirectly affected via the food chain. In this case such failures can be caused mainly as a result of very powerful earthquakes.

As far as seismicity is concerned, "Radiana" site is located within the stable part of the Moesian platform, which presupposes a low level of seismic activity in a subregional scale. The maximum expected earthquake in the subregion is  $M_{\max} = 5.0$ . The main sources of seismic danger are the seismic areas outside the region of the area. The most important of them is Vrancea zone in neighbouring Romania, which has generated earthquakes with magnitude of  $M > 7$ . The local outbreaks are of documented earthquakes of  $M < 4$  and fall within the category of background seismicity. According to earthquake maps for periods of 1000 and 10 000 years the area can be subjected to seismic effects of level VII scale MSK-64, to which the buildings and facilities are secured with a seismic coefficient  $C_s = 0.10$ . Therefore, the repository, its servicing installations (system for infiltrated water, system for deep drainages, their servicing reservoirs, etc.) and the servicing buildings, equipment and installations in them will be designed, constructed, scaled and secured in correspondence with the seismicity and level of seismic activity typical for the region with the seismic coefficient ( $C_s$ ) and the dynamic coefficient  $\beta_i$  will be determined pursuant to Art. 152 of Ordinance № RD-02-20-2/2012 for the design of buildings and facilities in seismic regions (SG, issue 13/2012). Thus, the risk of destruction of the construction of the repository, servicing buildings and their installations as a result of earthquake impacts in the range between level I and VII scale under MSK-64 for the periods of 1000 and 10 000 years will be completely neutralized. In the case, having in mind these periods, for the duration of the stages of operation, closure and institutional control of the repository – a total of about 400 years, the possibility of occurrence of an earthquake of a higher level (level VIII or higher scale under MSK-64) is negligible and actually absent. Even in the case of such an event, the negative effect of the release of the entire quantity of buried low and intermediate level RAW into the environment will be incomparably and negligibly low compared to the damage from the failed units of Kozloduy NPP situated nearby, which also has an earthquake resistance calculated up to level VII scale under MSK-64. After the stage of institutional control is over the repository site is subject to recovery of the land use as after this period the residual radioactivity of the buried RAW will no longer be able to cause above the level radiation of the living organisms.

Actually NRRAW is designed as a system of several barriers, which will guarantee the safe insulation of the radioactive waste from the environment for such a period of time during which the radionuclides in the waste are dangerous for the living organisms. These barriers act successively so that damage in one or more barriers or their degradation in time is compensated by the holding capacity of the remaining barriers.

With regard to possible terrorist attacks, there is a ban on overflying aircraft over the area, and access to the perimeter of the "Radiana" site will be monitored by police guards, and in addition there will be an internal department for physical protection. It will exercise control, supervision and monitoring over the facility 24 hours a day and will react in case violations are found. There will be constant supervision and monitoring of NRRAW during and after the normal work shift by means of alarms and signalizations including: fire alarms, cameras and sensor for physical protection, and alarm systems for breaking the parameter, alarms for radioactive protection. It was found that the only significant event with technogenic origin,



which can happen in the region, is an explosion of a vehicle crossing the power plant internal departmental road under the site and the section of the republic road II -11 Kozloduy – Hurllets – Mizia above the site. Since there will be no processes of mass energy transfer, pressure vessels, warehouses for explosives and other flammable materials, explosions in it are ruled out.

It is not possible for the site to suffer for destructive flooding due to natural or technogenic reasons in view of the climate and hydrologic characteristics of the terrain, its sufficient remoteness and altitude compared to the Danube River, as well as its slope and denivelation. The possibility of windspout is negligibly low.

In case of specialized vehicles (SV) accident during the transportation of RCC with RAW, taking into account the speed restrictions for the vehicles on the site (max. 30 km/h), the intensity of the crash impact will not be high, i.e. no deformation of RAW containers is expected. Even in the case of such an event the container will be immediately transported with another SV to the defect packaging unit or to “SE RAW Kozloduy” for additional conditioning and repackaging. Furthermore, given the low and intermediate level of radioactivity of RAW there is only a low risk of temporary, short-term and low radiation of the present flora and fauna (mainly insects) in the immediate vicinity of the accident.

**VI. PROPOSALS FOR MITIGATION MEASURES TO PREVENT, DECREASE OR WHERE POSSIBLE STOP THE NEGATIVE IMPACTS FROM THE INVESTMENT PROPOSAL RALIZATION ON THE PROTECTED AREAS AND DETERMINING THEIR LEVEL OF IMPACT ON THE SUBJECT OF PROTECTION IN THE PROTECTED AREAS AS A RESULT OF THE IMPLEMENTATION OF THE PROPOSED MITIGATION MEASURES.**

To prevent or maximally mitigate the potential impact on the habitats ad species subject to protection in the considered protected areas, we recommend the application of the following mitigation measures presented in Table.:

*Table 6.1.*

<i>No</i>	<i>Element of the investment proposal.</i>	<i>Habitat / species concerned by the measure.</i>	<i>Negative impact to be prevented or mitigated, which is envisaged in the measure.</i>	<i>Spatial location, where the measure is to be implemented.</i>
1.	No realization of construction works, building of landfills, warehouses, parking of vehicles and other IP related activities should be performed on other terrains outside the ones envisaged for utilization through construction with facilities, buildings and surface and underground infrastructure, the area of which amounts to a total of 87 ha or to about 20%	Mainly regarding the habitats outside the PA, which are suitable for feeding of some target species, as well as nesting habitats of some bird species (bushes and trees) outside the PA territories.	Direct destruction of forestry areas. Additional taking off of the humus layer. Unnecessary excavation and dumping activities – additional change of the soil conditions of the environment. Pollution with construction and hard domestic	The areas of “Radiana” site envisaged for planting and the undisturbed zones amounting to exactly 377 ha (about 80%) of the total site area, as well as its adjacent terrains, which fall outside the borders of “Zlatiyata” PA, “Kozloduy Islands” PA, “Ogosta River”



	of the total area of “Radiana” site and in violation of the approved projects.		waste. Additional driving away of animal species sensitive to human presence. Restricting the risk of destruction of bird nests and their eggs and juveniles.	PA, “Skat River” PA.
2.	<p>The construction works should be performed, if possible, during the daylight hours and if possible the internal asphalt road network of the power plant shall be used.</p> <p>The transportation of RCC from Kozloduy NPP site to NRRAW should be within the established work day on the internal road network of the power plant.</p>	Potential negative impact on some nocturnal species subject to protection in some of the protected areas (long-fingered bat for example).	<p>Additional indirect impact in the region on the animal species due to noise factors and vibrations generated during the work of construction and transport vehicles.</p> <p>Driving away of nocturnal animal species during the quieter part of the night as a result of increased human presence – for ex. Some target bat species whose areals during hunting and searching for food are not limited only within the range of the protected areas.</p>	The territory of the investment proposal and the transport network of Kozloduy NPP.
3.	If construction of the facilities, servicing buildings and the adjacent infrastructure of NRRAW and the preparation for operation are to start during the birds breeding period (the end of March – July), then the Contracting Authority should provide an additional tour of the terrain (the entire “Radiana” site) from experts with knowledge	The measure concerns mainly some bird species, for which there is a potential future possibility to settle within the site in order to nest on the trees. It covers the period between the finalization of the EIA and RADI and issuing a permit for construction and	Destruction of nests of birds and their eggs and chicks outside the protected areas that appeared afterwards (after the issuing of the permit under EIA until the start of the IP realization activities).	The measure is recommended for the entire “Radiana” site since during the construction of the facilities, the servicing buildings and the adjacent infrastructure of NRRAW, as well as in the formation of the areas envisaged for planting, it is necessary to

	<p>in the field of avifauna, who can establish the presence or lack of nests and when such are registered, to undertake the necessary "saving" measures by relocating them to similar biotopes at safe distance pursuant to a specially issued for the purpose permit as per the secondary legislative requirements of LB. If this is impossible to be fulfilled and done, than one of the following two alternative measures should be applied:</p> <p>1) to postpone the beginning of the construction stage until the breeding period is over and if necessary until the autumn migration.</p> <p>2) in order not to disturb the implementation of the scheduled plan of the project, which on one hand may be related to significant financial losses, and on the other hand to hinder the timely decommissioning of Kozloduy NPP units 1÷4, then even before the actual construction works on the repository have started, the areas subject to utilization can be cleared from trees and bushes, and this should be done outside the birds breeding period.</p>	<p>its actual beginning, which usually does not happen immediately after a possible positive decision on the EIA given the necessity of another series of administrative procedures afterwards concerning mainly the issuing of a construction permit. Pursuant to the provisions of EPL (art. 99, para 8) the IP realization can start within 5 years after the issuing of the permit under the EIA.</p> <p>Actually, the measure is prescribed, since during the construction works "free" period until the start of the IP realization (especially in the case that the period overlaps with the spring-summer season) there is some possibility for the future on the site or near it to settle for nesting some migrating target species included in Annex 2 of LB.</p>		<p>remove the trees and bush vegetation that covers these areas.</p>
4.	<p>In the construction of the repository with cells for disposal of containers with radioactive waste</p>	<p>The measure concerns both the habitats in the region of</p>	<p>Pollution of habitats suitable for feeding and rest of target spices</p>	<p>The measure concerns the controlled area of "Radiana" site,</p>

	<p>and in its closure after its capacity is exhausted should be applied all designed engineering barriers and the shielding layers comprising them envisaged in the project, incl. recultivation events (technical and biological recultivation) in order to prevent potentially released radionuclides from the RAW containers to enter the environment.</p> <p>The stability and endurance of the repository, its engineering barriers and the servicing systems should be designed, constructed, scaled and secured in correspondence with the seismicity and level of seismic activity typical for the region (level I and VII scale under MSK-64), and the dynamic coefficient <math>\beta_i</math> should be determined pursuant to the requirements of Ordinance № RD-02-20-2/2012 for the design of buildings and facilities in seismic regions (SG, issue 13/2012).</p>	<p>"Radiana" site and all habitats and species subject to protection in "Zlatiyata" PA, "Kozloduy Islands" PA, "Ogosta River" PA, "Skat River" PA, which can be secondary / indirectly radiationally affected in a negative aspect as a result of radioactive pollution of soils, rain and groundwater in the region of the site, through which the released radionuclides can be subsequently transferred to the scope of the PA as well.</p>	<p>outside the protected areas as a result of pollution with radioactive isotopes, as well as hindering the migration of such isotopes on the territories of the protected areas through transfer of polluted soils, rain and groundwater.</p>	<p>where the disposal facilities and the building for reception and temporary operational storage of containers with radioactive waste are located.</p>
5.	<p>To be used only construction machinery, heavy vehicles and specialized vehicles (SV) in good working condition for the transportation of the RAW packages to the repository, that meet all modern technical requirements, specifications, and norms that are obligatory in the EU.</p>	<p>Species subject to protection in the examined protected areas and their habitats outside the areas.</p>	<p>Excessive emission of exhaust gas from the construction machinery and the transport vehicles, as well as dust from their movement and dumping works. Increased fire risk because of the increased anthropogenic presence.</p>	<p>The two zones subject to construction within "Radiana" site ("controlled" and "supervised"), the road coming from Kozloduy NPP, the main access road and the internal site roads.</p>

			<p>Danger of accidental contamination.</p> <p>Impact on the animals due to noise factors and vibrations from the work of the construction and transport machinery.</p> <p>Pollution with construction and hard domestic waste.</p> <p>Accidents with RAW packages during their transportation.</p>	
6.	<p>In the biological recultivation after the closure of the repository and the formation of the terrain above it should be used grass mixtures with local for the country species, as well as local tree and bush species (for ex. small-leaved lime, English oak and some other types of oak, narrow-leaved ash, black poplar, Norway maple, etc.), which are found in the region and do not have the features of foreign, introduced species like the prevailing on "Radiana" site acacia, sophora and gleditsia.</p>	<p>Habitats subject to protection in the protected areas.</p>	<p>Risk of secondary impacts as a result of the invasion of ruderal and invasive species, for which there is a possibility, however small, to spread into the nearest parts of the protected areas.</p>	<p>The terrains within "Radiana" site which are envisaged for biological recultivation (mainly the already formed terrain above the repository after covering with soil the constructed multilayer covering construction above the sealed with RCC slabs burial cells).</p>

## VII. ALTERNATIVES AND ASSESSMENT OF THEIR IMPACT ON THE PROTECTED AREAS, INCLUDING ZERO ALTERNATIVE.

### VII.1 Alternatives of the investment proposal site by location.

All the activities related to the investment proposal realization (choice of site, design, construction, entering into operation, operation, closure) are subject to permission regime from

the Nuclear Regulatory Agency in compliance with the requirements of the *Law for the safe use of nuclear energy* and the Regulation on the procedure for issuing licenses and permits for safe use of nuclear energy.

The process of selecting a site comprises the following four stages in compliance with the requirements of art. 25, para 1 of , ал.1 of the *Ordinance on the safety of radioactive waste management*, the recommendations of the International Atomic Energy Agency (IAEA) and the good practices of RAW management in the developed European countries:

- 1) Development of a concept for disposal and selection of site planning;
- 2) Data collection and analyzing of the regions, which includes:
  - analysis of the regions – analysis and assessment of the territory of the entire country excluding big regions with unfavourable conditions for situating a facility for RAW disposal and determining the regions that present big territories with favourable geologic-tectonic, geomorphologic, hydrogeological, engineering-geologic, hydrologic, climate and other features.
  - Selection of perspective sites – in the regions subject to analysis are localized the potential sites, which meet the criteria for situating a facility for RAW disposal and the perspective sites for detailed research are determined.
- 3) Characterization of the sites – the perspective sites are examined in depth and one site is selected.
- 4) Confirmation of the site;

At the stage “Data collection and analyzing of the regions” from the site selection process SE “RAW” initially determined 78 sites, which were later reduced to 12 perspective sites for the location of NRRAW. After a detailed research and comparison of the features of these potential 12 sites, 4 perspective sites were selected for further research at the “Characterization of the sites” stage. Those were the following sites:

- **“Radiana”** site, situated on the land of the village of Hurlets, Kozloduy Municipality and in close proximity to Kozloduy NPP (within the 2-kilometer zone for preventive protection measures /ZPPM/).
- **“Marichin valog”** site, situated on the land of the town of Kozloduy, Kozloduy Municipality, at a distance of 2.5-3 km from Kozloduy NPP and outside the 2-km ZPPM.
- **“Brestova padina”** site, situated on the land of the village of Butan, Kozloduy Municipality, at a distance of 12 km from Kozloduy NPP and outside the 2-km ZPPM.
- **“Vurbitsa”** site, situated on the land of the village of Vurbitsa, Vratsa Municipality, at 52 km in a straight line distance from Kozloduy NPP (more than 90 km by road), outside the 2-km ZPPM.

At the “Characterization of the sites” stage SE “RAW” performed detailed field and laboratory research of these sites and within this stage **“Vurbitsa” site** dropped out of further consideration. The reason for the decision taken is the significant remoteness of the site from the main source of radioactive waste – Kozloduy NPP and minimizing the potential danger for the population during the transport of conditioned and packed radioactive waste to the NRRAW site. Pursuant to the legislative requirements the location of the site for near-surface burial of RAW should provide transportation of RAW to the facility with a minimum risk for the population. In the case, the shortest road from Kozloduy NPP (the main source of low and intermediate level RAW) to “Vurbitsa” site is more than 90 km and passes through 14 villages and therefore the legislative requirements for minimizing the risk for the population during the transportation of RAW are not met. **Regarding the European ecological network Natura 2000 the transport access to this site is not favourable as well, since it passes through two protected areas – “Ogosta River” PA BG0000614 (at the village of Glozhene, Kozloduy**



Municipality) and “Skat River” PA BG0000508 (at the village of Mizia, Kozloduy Municipality).

**“Brestova padina” site** is located 12 km of Kozloduy NPP, 6,0 km of the village of Kriva Bara, and 7.5 km of the village of Butan (geographic coordinates: N43°40’33.37”, E23°38’11.68”; 43°40’22.33”, 23°38’51.36”; 43°40’14.02”, 23°38’46.83”; 43°40’25.28”, 23°38’07.28”). The site is within arable farmland and is also entirely surrounded by such land – it consists of carbonate chernozem soils, which are the best for growing produce. In the 10-km zone the arable land is more than 85% and a road deviation to the site should also be constructed through it. There is also a dam located nearby. This is one of the secondary reasons for this site not to be selected for the NRRAW realization. **In this case, the main and primary reason for this site not to be selected is that it falls in the core of “Zlatiyata” PA BG0002009** declared by Order № RD-548/05.09.2008 of the Minister of Environment and Water, **which also predetermines the absolute nonconformity of the IP with the goals and subject of protection in the area.**

**“Marichin valog” site** is located about 3.5 km of the town of Kozloduy and 2.5 km west-northwest of Kozloduy NPP (geographic coordinates: N43°44’00.38”, E23°43’23.93”; N43°44’25.66”, E23°43’57.95”; N43°44’21.12”, E23°44’06.18”, N43°43’55.99”, E23°43’31.87”). A surface highly modified water body passes through the site territory, it is of river category in the river basin of the Danube River and has a code of BG1DU000R001. The ecological potential of the water body is moderate, and its chemical condition is assessed as bad. The specific ecological goal for the surface water body is “Prevention of the deterioration of the ecological potential and achieving good potential until 2021” and “Prevention of the deterioration of the chemical condition and achieving good condition until 2027”. There is an exception for the achieving of the ecological goals accepted for the water body due to the significant anthropogenic impact. This is one of the secondary reasons for this site not to be selected for the NRRAW realization. **In this case, the main and primary reason for this site not to be selected is that it falls in the core of “Zlatiyata” PA BG0002009** declared by Order № RD-548/05.09.2008 of the Minister of Environment and Water, **which also predetermines the absolute nonconformity of the IP with the goals and subject of protection in the area.**

Given the characteristics of the above-described alternative sites regarding the European ecological network Natura 2000 the most appropriate is to realize the IP in the site presented in RADI – **“Radiana” site, which does not fall within protected areas and is located at a maximum proximity to Kozloduy NPP and thus the transportation of the RAW packages from the installation for their treatment, conditioning and packaging at the NPP site is also not related to passing through the territories of the protected areas.**

## ***VII.2 Alternatives regarding the type of the repository.***

Prior to choosing the module type of facility as presented in the REIA and RADI were analyzed two main technologies for burial of low and intermediate level RAW of Category 2a: in a modular near-surface engineering trench-type facility and tunnel-type facility.

Modern trench-type repositories are realized in Centre d’Obe – France, El Cabril – Spain, Mochovce in Slovakia, Dukovany in the Czech Republic, etc. The technology developed to bury in trenches is based on the French and Spanish technology, which is presented in details in the IP annotation in this paper.

Modern tunnel-type repositories are realized in Sweden and Finland, and in the case such technology was offered in the Swiss concept. There the repository represents a system of reception, transportation and ventilation galleries. Analogically to the trench-type repository, the tunnel-type repository is also modular, organized in 8 tunnel works. The galleries are dug in

a standard mining-construction method by heading-and-winning combine. After the period for development of non-elastic deformations in the contour of the works the massif around them is strengthened by cementation and silicification of the soil. An impervious reinforced concrete lining is constructed with mechanized laying of the concrete under a pressure of 200 atmospheres. The packages are put in the tunnels for disposal by means of transportation lift trucks on rails or tires. Along the reception tunnels is organized a water collection system that discharges into a joint collector, passing through the ventilation or transportation gallery. There is a possibility for flow control and water abstraction for each monitored section. The collector drains the water in the reservoir for contaminated water, from which depending on the content of radionuclides the water is either released, or sent for conditioning. After the reception galleries are filled with packages the free space is filled with inert material preventing the possible deformation of the lining. In the mouths of the reception galleries (tunnels) are put clay “caps” and separation walls are built. There is a provided system for gas clearing and separate drainage systems for management of surface water, groundwater and underground waters.

Both types of repositories present multi-barrier engineering facilities, the safety of which is provided by passive means. Safety is based on the implementation of deep separation protection, which is achieved through simultaneous application of a system of physical barriers and technical and organization measures, providing the following levels of protection:

- ✓ A system of consecutive physical barriers on the path of distribution of radioactive substances into the environment;
- ✓ A system of technical and organization measures to protect the barriers and maintain their efficiency;
- ✓ A system of technical and organization measures to protect the personnel, the population and the environment.

In this respect the choice of technology for the IP realization does not significantly concern the potential impact on the protection subject and goals of the protected areas from Natura 2000 ecological network, since regardless of the type of the repository it is situated outside the scope of PA and is not neighbouring any, while the multi-layer engineering barriers for both types in any case prevent the possibility of radioactive pollution of water, soil, air, geological environment and the elements of biological diversity in the region of the site as a result of above-limit migration of radioactive isotopes in them and hence the possibility for secondary / indirect pollution of the territories of the nearest PA or for impact on the species subject to protection in them. With the tunnel-type the advantage is that the construction is related to the generation of significantly less dust and noise emissions on the surface, and the affected surface area is significantly less, but this can be ignored, given that during the realization of the surface modular repository no habitats in PA or the species subject to protection in them are affected when the preventive and mitigation measures suggested in RADI are applied.

### ***VII.3 Zero alternative.***

Pursuant to section 8 of the additional requirements of the Ordinance for compatibility assessment of plans and programs with the aims of protection of protected areas, a “zero” alternative is a description of the current situation and the results of it in the cases when the investment proposals offered cannot be implemented. The zero alternative will preserve the current ecological status of the species and habitats outside the protected areas. The zero alternative, i.e. the non-implementation of the investment proposal will not cause a negative impact on the components of the environment in the considered protected areas, while no significant impacts in this respect are also expected as a result of the IP implementation. This alternative is completely compatible with the purposes and subject of protection of the areas. It

can be implemented in view of the protection purposes of the protected areas and application of the acting Law on biodiversity, Directive 2009/147/EC and Directive 92/43/EEC.

In this case, the zero alternative means not to bury packages with radioactive waste on “Radiana” site, i.e. no NRRAW to be constructed. In this situation it is necessary to note that at present low and intermediate-level RAW, that are generated in the operation of NPP Kozloduy and the accumulated historical RAW are processed in the facilities of SE “RAW – Kozloduy” and the conditioned waste is stored in a “Warehouse storage for conditioned RAW” on the power plant territory, that has a capacity of 1920 RCC. In the warehouse are also stored the conditioned low and intermediate level RAW from the decommissioning of Kozloduy NPP units 1÷4. The storage capacity is calculated in view of the fact that it is an intermediate unit in the entire system of radioactive waste management and pursuant to the requirements of the Bulgarian nuclear legislation, the safety standards of IAEA and the European Union Directive 2011/70/Euratom of 29 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste. At present 1368 RCC are stored in the warehouse. At the rate of filling the warehouse with conditioned radioactive waste, which are determined by the production requirements for providing the normal operation of Kozloduy NPP and guarantying the normal execution of the decommissioning process for units 1÷4 of the power plant, the capacity of the warehouse will be over in less than 4 years. Besides, this warehouse actually provides conditions for temporary storage of RAW before their disposal, i.e. it does not meet the conditions and requirements for long-term storage and disposal of RAW. Given all that, the realization of the zero alternative is related to the following negative consequences:

- ✓ Exhausting the capacity of the warehouse for storing conditioned low and intermediate-level RAW generated during the operation of Kozloduy NPP, which is also related to swift exhausting of the temporary capacity for storing unprocessed RAW and respectively stopping the work of units 5 and termination of the program to extend their period of operation. This will entail serious social and economic consequences for the population and industry of the country, resulting in significant increase in the electricity price because the cheap electricity from Kozloduy NPP will drop out of the energy mix.
- ✓ Stopping the decommissioning process for units 1÷4 of Kozloduy NPP due to the lack of capacity for temporary storage of conditioned radioactive waste and the lack of capacity for their disposal. Stopping and decommissioning of units 1÷4 of Kozloduy NPP is part of Bulgarian EU accession treaty. In order to implement the decommissioning process Bulgaria is financed by “Kozloduy” International Fund. Any default of the country will lead to significant financial penalties.
- ✓ Impossibility to construct new nuclear capacities, i.e. of unit 7 of Kozloduy NPP. The construction of new nuclear capacities is subject to approval by the European Commission and a significant condition is the presence of repository for disposal of radioactive waste that will be generated during the operation of the new nuclear capacity.
- ✓ Last but not least, it should be pointed out that storage of unprocessed RAW for a long period of time is an ecologically inappropriate decision, which causes a significant radiation risk for the site personnel, the population and the protected areas from the European ecologic network Natura 2000 in the region. A certain risk to this respect also poses the storage and prolonged keeping of the conditioned and packed RAW in the warehouse storage for conditioned RAW since there is a possibility of potential radioactive pollution of the environment in the region as a result of failures and accidents with the containers and the premises, which does not have the specific construction and specialization of RAW repository due to the lack of engineering barriers that are applied in the construction of such repositories.

Given the above-listed circumstances the conclusion can be drawn that the “zero alternative” is more inexpedient than the IP realization.

#### ***VII.4 General assessment of the alternatives.***

The assessments made in respect of the expected impacts on the subject and goals of protection in the protected areas allow the “zero alternative” not to be applied.

Regarding the location of the considered alternative sites for the IP realization we consider as most acceptable and appropriate ***“Radiana” site, since it is not located within Natura 2000 protected areas and the transportation of RAW containers to the site is not related to crossing such areas.***

Regarding the presented types of facilities for disposal of low and intermediate level RAW, the selection of either type does not create significantly variable preconditions for possible impacts on the subject and goals of protection in the nearest Natura 2000 protected areas, and ***the realization of the near-surface modular repository is to be in strict fulfillment of the preventive and mitigation measures described in this paper.***

### **VIII. MAPS WITH THE LOCATION OF THE INVESTMENT PROPOSAL IN RELATION TO THE PROTECTED AREAS AND THEIR ELEMENTS.**

Maps with the location of the IP components in relation to the protected areas and their elements are presented as an additional Annex to the report on assessment of the degree of the impact (*Annex 9*), as well as on **Figure I-3** in the text.

### **IX. CONCLUSION ON THE TYPE AND LEVEL OF NEGATIVE IMPACT UNDER THE CRITERIA OF ART. 22 OF THE ORDINANCE ON CA.**

The investment proposal does not fall within the territory of the protected areas and is not located next to such. The minimum distances of “Radiana” site within which the IP will be realized (in a straight line distance) to the nearest protected areas are as follows:

- 0.45 km from “Zlatiyata” PA BG0002009;
- 3.8 km from “Kozloduy Islands” PA BG0000533;
- 6.0 km from “Ogosta River” PA BG0000614;
- 6.3 km from “Skat River” PA BG0000508;

The IP realization is not is not related to utilization or taking away of areas, that are natural habitats or habitats of species, subject to protection within the protected areas. It also does not affect conservationally significant or valuable for the various species habitats outside the protected areas.

The activities within “Radiana” site are not in the condition to cause fragmentation of plant communities and natural habitats of target animal species within the nearest areas. The transportation of RCC with RAW from their packaging unit situated at Kozloduy NPP site is also not related to crossing PA and respectively to territorial fragmentation of such. No serious additional preconditions can be created to hinder the movement of target land animal species and birds among the territories of the different areas in the region, given the planned density of construction and the project height of the repository and the servicing premises. Subject to construction are 87 ha, on which will be located the repository, the servicing buildings and the adjacent infrastructure, while 377 ha of the territorial coverage of “Radiana” site are envisaged for planting and undisturbed zones.

The realization of NRRAW IP does not presuppose negative direct and considerable indirect impact and is not cumulated with such, upon the nearest protected “Zlatiyata” PA BG0002009, “Kozloduy Islands” PA BG0000533, “Ogosta River” PA BG0000614 and “Skat River” PA BG0000508 if following the project technologies for construction and operation and applying the mitigation measures envisaged in this paper. The operational safety of the repository regarding release of radionuclides and radioactive radiation is based on the application of deep separation protection, which is achieved through simultaneous application of a system of physical barriers and technical and organization measures, providing several levels of protection. The burial of the packages with RAW of Category 2a (pursuant to *Ordinance on the safety of radioactive waste management*) in the facility cells through their closure and coverage with multilayer engineering barrier (including the previously laid loess-cement cushion below them) will completely neutralize the possibility of radioactive pollution of water, soil, air, geological environment and the elements of the biological diversity in the region as a result of gamma radiation, hence, there cannot be any secondary / indirect pollution of the territories of the nearest PA or impact on the species subject to protection in them. This will also be facilitated by the systems servicing the repository – mainly the network for control and discharge of infiltrated waters and the network for deep drainages.

**X. EXISTENCE OF CIRCUMSTANCES UNDER ART. 33 OF LB AND PROPOSAL FOR SPECIFIC COMPENSATORY MEASURES UNDER ART. 34 OF LB – WHEN THE CONCLUSION UNDER SECTION 9 IS THAT THE SUBJECT OF PROTECTION OF THE RESPECTIVE PROTECTED AREA WILL BE SIGNIFICANTLY HARMED BY THE REALIZATION OF THE PLAN, PROGRAM AND PROJECT OR BY THE REALIZATION OF THE INVESTMENT PROPOSAL AND THAT THERE IS NO OTHER ALTERNATIVE SOLUTION AVAILABLE.**

Here it is necessary to point out that in relation to the change of purpose and manner of permanent use of the newly formed land properties falling within “Radiana” site (MPU as “Forests in arable lands” to MPU “Other settlement territory”), at present the Contracting Authority has already paid the necessary amount for compensatory planting, which is performed pursuant to the requirements of art. 86, para 5 of the Forestry Law and the respective payment document was issued. Given this fact and the above-written conclusion, there are no circumstances under art. 33 and art. 34 of LB imposing the necessity to envisage other compensatory measures.

**XI. METHODOLOGIES AND SOURCES OF INFORMATION USED FOR THE FORECAST AND ASSESSMENT OF THE LEVEL OF IMPACT.**

In carrying out the assessment were used standard methods of field research, applied for determining the species composition of the high plants and vertebrates. Field research on fito- and zoocenosis is carried out in 2010 and 2014.

The analyses and conclusions drawn are in correspondence with the requirements of the European Union Directives, the harmonized Bulgarian environmental legislation and all international conventions of which the republic of Bulgaria is a party. As source of information for the region and the protected areas was used rich bibliography, web sites and NGO publications, a list of which is enclosed to this paper.



**XI.1 Bibliography and sources of information.**

1. Report on EIA of the investment proposal.
2. Concept project (Alternative 1) 2013-11-01 of: “Radiana National Repository Site, Kozloduy”. General plan. Explanatory note.
3. Concept project (Alternative 1) 2013-11-01 of: “Radiana National Repository Site, Kozloduy”. Section General Explanatory note.
4. Concept project (Alternative 1) 2013-11-01 of: “Radiana National Repository Site, Kozloduy”. Section Architecture. Explanatory note.
5. Concept project (Alternative 1) 2013-11-01 of: “Radiana National Repository Site, Kozloduy”. Section Technology. Explanatory note.
6. Concept project (Alternative 1) 2013-11-01 of: “Radiana National Repository Site, Kozloduy”. Section Constructive. Explanatory note.
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8. Concept project (Alternative 1) 2013-11-01 of: “Radiana National Repository Site, Kozloduy”. Section Water and Sewerage. Explanatory note.
9. Concept project (Alternative 1) 2013-11-01 of: “Radiana National Repository Site, Kozloduy”. Section Control and management systems. Radiation monitoring. Calculation note. Doses of professional radiation at NRRAW. Explanatory note.
10. Concept project (Alternative 1) 2013-11-01 of: “Radiana National Repository Site, Kozloduy”. Section Constructive. Project specters of reaction during seismic impact. Explanatory note.
11. Technical project 2013-10-01 of: “Radiana National Repository Site, Kozloduy”. Section General Explanatory note. Explanatory note.
12. Technical project 2013-10-01 of: “Radiana National Repository Site, Kozloduy”. Section Technology. Explanatory note.
13. NRRAW pre-operational seismic monitoring program.
14. Report on execution of the task: Prognosis of the flood and erosion danger from the Danube River of “Radiana” site for repository of LILRAW.
15. Report on task: “Assessment of the variation of groundwater level of “Radiana” site at maximum elevation of water level of the Danube River.”
16. Biological diversity act (promulgated State Gazette , issue 77/August 9<sup>th</sup> 2002, amended State Gazette, issue 66/2013);
17. Ordinance on provisions and order for conduction of compatibility assessment of plans, programs, projects and investment proposals with the matter and aims of protection of protected zones regulation (promulgated State Gazette, issue 73, September 11<sup>th</sup> 2007, amended and complemented State Gazette, issue 94/2012);
18. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. - OJ L 206, 22.7.1992, 7–50.
19. Directive 2009/147/EC of the European Parliament and the Council of 30 November 2009 on the conservation of wild birds;

20. NATURA 2000, Standard Form BG0002009 "Zlatiyata" Protected Area;
21. NATURA 2000, Standard Form BG 0000533 „Kozloduy Islands" Protected Area;
22. NATURA 2000, Standard Form BG 0000614 „Ogosta River" Protected Area;
23. NATURA 2000, Standard Form BG 0000508 „Skat River" Protected Area;
24. MEW – "Mapping and determining the conservation status of natural habitats and species – stage 1" carried out under OP Environment 2007-2013.
25. Geography of Bulgaria, 2002, Geography institute, BAS;
26. General biogeography. Publishing House of the St. Kliment Ohridski University, 1994;
27. Bondev, I., 1991. Vegetation in Bulgaria. Map in scale 1:600000 with explanatory text. Publishing House of the St. Kliment Ohridski University, Sofia, p. 183;
28. Botev, N., 1981. Hunting Reserve, Zemizdat, Sofia;
29. The Red Book of Republic of Bulgaria, 2011, electronic edition: Vol. 2 - Animals, Vol. 3 – Natural habitats. BAS and MOEW;
30. Yankov, P., (editor). 2007. Atlas of the Nesting Birds in Bulgaria, Bulgarian Society for the Protection of Birds, Series of publications on environmental protection topics, Booklet 10, Sofia, BSPB;
31. Svensson, L. Birds of Europe: With North Africa and the Middle East (Helm Field Guides), Sofia, BSPB;
32. Beshkov, V., K. Naney, 2002. Amphibians and Reptiles in Bulgaria. Pensoft, Sofia;
33. Biserkov, V (editor) 2007 Guide to amphibians and reptiles in Bulgaria, Sofia, Green Balkans;
34. Popov, V, Sedefchev, A 2003, Mammals in Bulgaria, Geosoft EOOD, Sofia;
35. Information from bibliographical sources, from fauna specialists.

#### ***XI.2 Used methodologies, manuals, and methods of research.***

1. Interpretation Manual of European Union Habitats, 1999. Publishing House of Green Balkans;
2. Kavrakova, V., Dimova, D., Dimitrov, M., Tsonev, R., Belev, T., Rakovska, K., /edit./ 2005. Manual for Determining the Habitats of European Importance in Bulgaria. First edition, p. 129, Sofia, World Wildlife Fund, Danube-Carpathian Program and Green Balkans Federation;
3. Kavrakova, V., Dimova, D., Dimitrov, M., Tsonev, R., Belev, T., Rakovska, K., /edit./ 2009. Manual for Determining the Habitats of European Importance in Bulgaria. Second revised and supplemented edition, p. 131, Sofia, World Wildlife Fund, Danube-Carpathian Program and Green Balkans Federation;
4. Managing Natura 2000 Sites. The provisions of Article 6 of the "Habitats" Directive 92/43/EEC. European Communities, 2000;
5. Assessment of plans and projects significantly affecting NATURA 2000 sites, Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, EC, November, 2001;

6. Assessment of plans and projects significantly affecting Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, November 2001;
7. Guidance document on Article 6(4) of the “Habitats” Directive 92/43/EEC. Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission, January, 2007;
8. Zingstra, H., Kovachev, A., Kitnaes, K., Tsonev, R., Dimova, D., Tsvetkov, P., (edit.) 2009. Guidelines for assessing favorable conservation status of Natura 2000 species and habitat types in Bulgaria. Publishing House of the Bulgarian Biodiversity Foundation, Sofia;
9. Guide on assessment of protected zones, based on Art.7 Para. 3 and 4 of the Biological diversity act, including habitats of bird species;
10. Kostadinova, I., Mihaylov, M., (selector) 2002 Manual for NATURA 2000 in Bulgaria. BSPB, a series of publications on environmental protection topics. Booklet 5. BSPB, Sofia, p. 80.
11. Individual field observations and studies of the IP site and of the region around it (2010 and 2014):
12. ground, incl. individuals count;
13. route, , incl. individuals count;
14. static, incl. individuals count;
15. Questionnaire data from local forestry and hunting reserves employees, local hunters and environmentalists.

## **XII. DOCUMENTS UNDER ART. 9, PARA 2 AND 3 OF THE ORDINANCE ON CA.**

### **For the specialist on protection of animal species from Annex 2 of LB and their habitats – Georgi Vladimirov Zagorov:**

- Copy of Diploma of higher education for Master’s education and qualification degree;
- Copy of Certificate issued by MEW № 983/04.09.2008 for entry in the public register of experts engaged in EA and EIA for the following components: “Plant kingdom”, “Animal kingdom”, “Soil”, “Landscape” and as “Head of team”;
- Documents, certifying professional experience in the field as per art. 9, para 1, it. 2 and it. 3 of the Ordinance on CA;
- Declaration as per art. 9, para 3 of the Ordinance on CA, signed by the specialist Georgi Zagorov;

### **For the specialist on protection of natural habitats, including animal species (without birds) – Mihail Antonov Mihaylov:**

- Copy of Diploma of higher education for Master’s education and qualification degree;
- Copy of Certificate issued by MEW № 1715 / 16.05.2007 for entry in the public register of experts engaged in EA and EIA for the following components: “Climate factors”, “Surface water”, “Waste”, “Soil”, “Plant kingdom”, “Animal kingdom”, “Modeling the impact on the environment”;

- Copy of certificate of service, issued by “MMM” EOOD, Sofia;
- Declaration as per art. 9, para 3 of the Ordinance on CA, signed by the specialist Mihail Antonov Mihaylov.

**For the specialist on protection of animal species (birds) from Annex 2 of LB and their habitats – dr. Dinyo Todorov Kyuchukov:**

- Copy of Diploma of higher education for Master’s education and qualification degree;
- Diploma for Doctor’s education and scientific degree issued by HAC;
- Copy of Certificate issued by MEW № 2/07.04.2006 for entry in the public register of experts engaged in EA and EIA for the component “Animal kingdom”;
- Documents, certifying professional experience in the field as per art. 9, para 1, it. 2 and it. 3 of the Ordinance on CA;
- Declaration as per art. 9, para 3 of the Ordinance on CA, signed by the specialist dr. Dinyo Todorov Kyuchukov;

**XIII. ANNEXES.**

Description of annexes		
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1.	Letter from REWI – Vratsa with exit № V-981/29.05.2014.	2
2.	General plan of the NRRAW site.	1
3.1	Excerpt of cadastral map of the region, within which is located the site, with given numbers and purposes of the land properties in the region.	1
3.2	Sketches of the properties falling within the scope of the site.	3
3.3	Statement of MAF with exit № 91-800/10.05.13 for the change of the purpose and MPU of the established new land in “Radiana” site.	3
4.	Vertical section of the repository showing the location of the loess-cement base.	1
5.	Plan of the engineering barriers of NRRAW.	1
6.	Letter from REWI – Vratsa № V-1701/12.08.2014.	1
7.1	Map with marked location of “Zlatiyata” PA BG0002009.	1
7.2	Map with marked location of “Kozloduy Islands” PA BG0000533.	1
7.3	Map with marked location of “Ogosta river” PA BG0000614.	1
7.4	Map with marked location of “Skat river” PA BG0000508.	1
8.1	Map of the vegetation spread in the region of “Radiana” site.	1
8.2	A record from State Forestry – Oryahovo with characteristics of the tree species spread in the region of “Radiana” site and map with the location of the divisions and sub-divisions in which they are located.	3
8.3	A record of the performed field visits of the site, certified by the Manager of “Ekoenergoproekt”, which also presents the key coordinates of the routes.	2
9.	Maps showing the location of “Radiana” site in relation to the four protected areas.	1
10.1	Documents as per art. 9, para 2 and 3 of the Ordinance on CA for the specialist on protection of the animal species (invertebrate, herpetofauna, and mammals) from Annex 2 of LB and their habitats – Georgi Vladimirov Zagorov.	24

10.2	Documents as per art. 9, para 2 and 3 of the Ordinance on CA for the specialist on protection of the animal species (birds) from Annex 2 of LB and their habitats – dr. Dinyo Todorov Kyuchukov.	25
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## **APPENDIXES**

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1.	Letter of RIEW - Vratsa with output № B-981/29.05.2014 г.	2
2.	General plan of the site of National Radioactive Waste Repository Kozloduj – Bulgaria.	1
3.1	Excerpt from cadastral map of the area where is situated National Radioactive Waste Repository Kozloduj – Bulgaria.	1
3.2	Sketches of the properties covered by the site of National Radioactive Waste Repository Kozloduj – Bulgaria.	3
4.	Vertical elevation plan of National Radioactive Waste Repository Kozloduj – Bulgaria on which is given the situation of the loess-cement cushion.	1
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6.	Letter of RIEW - Vratsa with output № B-1701/12.08.2014 г.	1
7.1	Map with the situation of Natura 2000 birds directive site BG0002009 „Zlatiyata”.	1
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8.1	Vegetation map of the site of National Radioactive Waste Repository Kozloduj – Bulgaria.	1
8.2	Information and map from state forestry – Oriachovo with characteristic common woody plant species in the area of the National Radioactive Waste Repository Kozloduj – Bulgaria.	3
8.3	Information for made field visits to the site.	
9.	Map with the location of the site to the four protected zones.	
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