



PHOTO REPORT

**Small hydro power plant ref. no. 45 – Krapska reka,
Makedonski brod municipality, Macedonia**



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1. Introduction

The concessioner “Aktuel Energy Group DOO – Skopje” has begun the construction of the small hydro power plant (SHPP) ref. no. 45 – Krapska reka in the Makedonski Brod municipality in the Republic of Macedonia. It is located near the Krapa village on the Dautica mountain, part of the Jakupica Emerald site (MK0000017). The powerhouse is around one kilometre upstream of the village and the intake is some five kilometres upstream of the powerhouse. The construction of the SHPP, which has a projected installed capacity of 270KW, is supported by a loan from the European Bank for Reconstruction and Development (EBRD).¹

Our understanding is that the EBRD claims that this project is outside of the Emerald zone. For that reason, we made efforts to confirm the location of the plant. The location of the powerhouse (41.558393, 21.324443) and the intake (41.578905, 21.342323) was verified by GPS on the ground. Eko-svest has requested data/shape files of the Jakupica proposed Emerald site from the Ministry of Environment by FoI request on 13.07.2018. In response on 14.08.2018, Ministry claimed that they ‘have lost the data’ and referred Eko-svest to use the data from Macedonian Ecological Society (MES) a partner organization of the Ministry that was also involved in designating Emerald sites. Shape file obtained from MES is attached. Comparing these two sources, we concluded that Krapska reka as well as the powerhouse, pipeline and the intake of the Krapska SHPP (in construction) are located inside of the Jakupica Emerald site. If we are right, this amounts to a serious error in the due diligence process.

¹ <https://www.ebrd.com/work-with-us/projects/psd/direct-finance-framework.html>

2. Significance of biodiversity and habitats

The valley of the Krapska reka is part of the Jakupica Emerald area and could become part of the Jakupica Natura 2000 area in the future upon Macedonia's entry in the European Union. The area is considered a biodiversity hotspot and is home to numerous endemic and endangered species with the Balkan Lynx (*Lynx lynx*) being the most notable one which is also mentioned in the Environmental Elaborate.

Picture 1. Location of the Krapska reka SHPP. The yellow area is the Jakupica Emerald area and the red pins are coordinates of the powerhouse and the intake.



Other significant species included in the Elaborate are: Brown Bear (*Ursus arctos*), Balkan Chamois (*Rupicapra rupicapra*), European Pine Marten (*Martes martes*), Golden Eagle (*Aquila chrysaetos*) and Black Stork (*Ciconia nigra*). According to the data form² on the Jakupica Emerald site, other threatened and endangered species, such as the Eurasian Otter (*Lutra lutra*), Large Copper butterfly (*Lycaena dispar*), Rosalia Longhorn beetle (*Rosalia alpina*) and

² <http://natura2000.eea.europa.eu/Emerald/SDF.aspx?site=MK0000017&release=2>

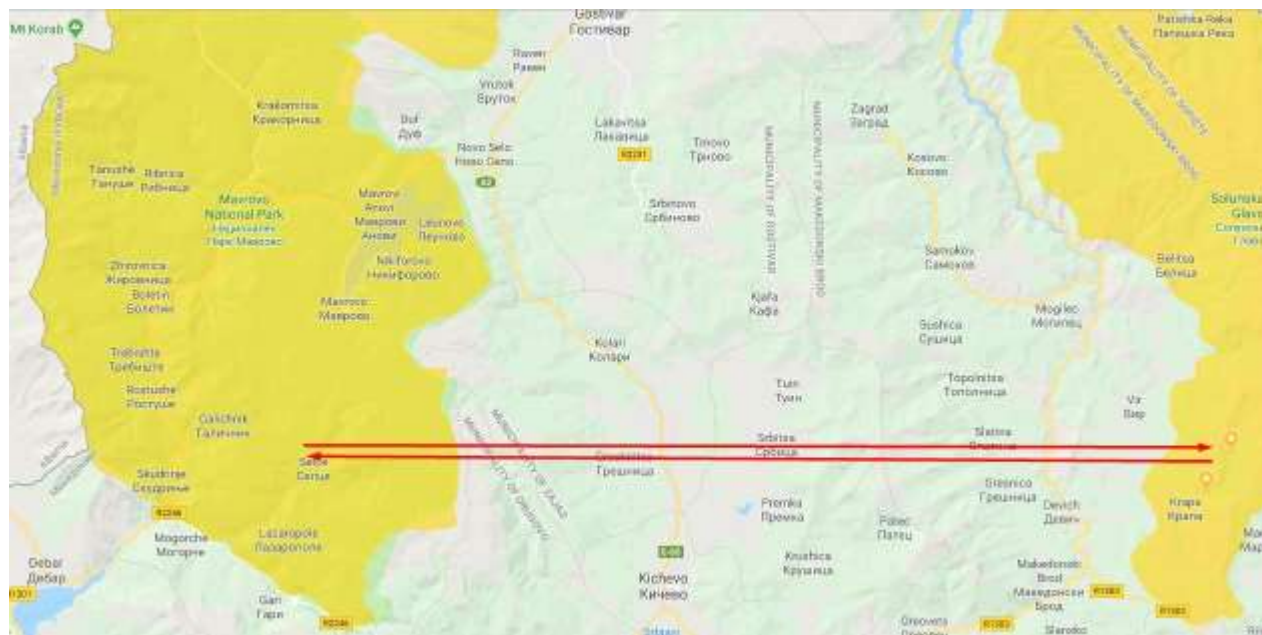
various endangered bats that have populations in the surrounding caves (Mediterranean horseshoe bat (*Rhinolophus euryale*), Greater horseshoe bat (*Rhinolophus ferrumequinum*), Lesser horseshoe bat (*Rhinolophus hipposideros*)) are present in the area, but were not assessed in the Elaborate and thus no mitigation measures were included for them.

The flora is represented by the endemics Macedonian Alpine Pasque Flower (*Pulsatilla halleri* ssp. *macedonica*), *Cephalaria flava*, *Laserpitium garganicum*, *Hieracium pannosum*, Rumelian green weed (*Genista rumelica*), *Melampyrum heracleoticum*, Giant Hog Fennel (*Peucedanum austriacum*) and *Thesium linophyllum*.

According to expert reports the presence of the Balkan Lynx was confirmed with photo traps on the southern edges of the Jasen reserve, some 15 kilometers north of SHPP Krapska reka. Their territory varies from one hundred to more than thousand square kilometers depending on food availability.

Additionally, after the construction of the HPP Kozjak, the southern slopes of the Jakupica mountain range where Krapa is located are the only remaining migratory route for large mammals from NP Mavrovo and the surrounding protected areas to Jakupica and back. With additional infrastructure projects in the valley of Krapska reka the habitat segmentation for large mammals will continue and will further limit their migration options.

Picture 2. Both Mavrovo and Jakupica are important habitats for endangered large mammals including the critically endangered Balkan Lynx. According to experts they often migrate between the two areas in search of food right through the Krapa valley.



The information on fish in the Environmental Elaborate is too broad and includes the whole Treska river basin. No field research was made on Krapska reka during the preparation of the Elaborate.

Krapska reka, its river bed and the surrounding caves are considered an extremely important speleological site and has been subject to continuous speleological research in the past 50 years. It is Macedonia's most important and most valuable sinking river. Several hundred meters downstream from the Krapa village it sinks into a cave system filled with underwater lakes that is more than 10 kilometers long. There have been unconfirmed reports from diving expeditions inside the caves that there is an unknown species of blind fish living in the lakes and further exploration was planned by speleological organisations to confirm the findings. This information is not included in the Environmental Elaborate and potential impacts on this species was not assessed.

If additional studies on biodiversity were performed on-site by the EBRD, they were not yet disclosed at the time of the preparation of this report.

Picture 3. The location where Krapska reka enters the underground cave system. A lot of plastic bottles can be seen around the entrance and compared to the findings at the construction site it is very possible that their origin is from the workers.



Although it is subject to additional research, according to experts this is not the only part of the river where there is water loss in the karst and the river itself together with the water springs in the area is an important source of drinking water for many of the surrounding villages.

In July 2018, after receiving information that construction works have begun on the Krapska reka SHPP, a field visit was organised to confirm the location of the SHPP infrastructure and to confirm the proper implementation of the mitigation measures.

This report is to summarise the identified problems and to alarm the authorities about the problems that arise from disrespect of the mitigation measures in a highly sensitive zone such as the Krapska reka valley.

3. Environmental mitigation measures identified in the Environmental elaborate

The Environmental elaborate for the SHPP Krapska reka was finalized in February 2015. It outlines mitigation measures in several categories, most importantly in the following:

Protection of flora and fauna

Under this measure, the following specific and relevant activities have been laid down in the environmental elaborate (the list is not complete):

- Proper enclosure of the construction zones to prevent the crossing of animals;
- Minimizing the destruction of vegetation along the route of the pipeline and maintenance of the vegetation on the location.

Waste management

Under this measure, the following specific and relevant activities have been laid down in the environmental elaborate (the list is not complete):

- Reduction of waste generated by construction workers;
- Selection, reuse and recycling of particular waste types.

Soil quality

Under this measure, the following specific and relevant activity have been laid down in the environmental elaborate (the list is not complete):

- In case of oil leaks the entire affected soil surface needs to be removed and properly treated.

Water quality

Under this measure, the following specific and relevant activities have been laid down in the environmental elaborate (the list is not complete):

- Prevention of disposal of waste near or in the surface waters and prevention of oil leaks or fuel from the vehicles;
- Avoidance of sedimentation near river crossings;
- Use of prefabricated toilets and their continuous maintenance.

Good construction practice

Under the Construction Law³ and the Law on Health and Labor Safety⁴ the following specific and relevant activities have been laid down to ensure good construction practice and labor safety (the list is not complete):

- Appropriate marking of the construction site with all the relevant information: investor, contractor, construction permit number etc.;
- Usage of traffic signs to mark the construction sites that can't be enclosed;
- Appropriate marking for dangers on the construction site and for usage of equipment for personal protection;
- Usage of protective fence on the scaffolding;
- Usage of equipment for personal protection.

³ http://mtc.gov.mk/media/files/Zakon_za_gradenje_130_28102009.pdf

⁴ <https://www.pravdiko.mk/wp-content/uploads/2013/11/Zakon-za-bezbednost-i-zdravje-pri-rabota-PRECHISTEN-TEKST-10-04-2013.pdf>

4. Report of violation of the environmental measures

This report gives an overview of violations of the mitigation measures and good construction practices indicated in the Environmental elaborate for the project. The findings in this report are based on a field visit that took place on 7th of July 2018. The report presents photos to support the findings. Apart from being violations of the national legislation the following findings we see as contradicting provisions of Performance Requirement 2 - Labour and Working Conditions, Performance Requirement 3 - Resource Efficiency and Pollution Prevention and Control and Performance Requirement 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources of the EBRD Environmental and Social Policy.

Proper enclosure of the construction zones to prevent the crossing of animals

Because the area is an important migratory route for large mammals it is extremely important to prevent them from entering the construction sites. Contrary to the recommendation, none of the construction sites were properly enclosed at the time of the field visit.

Pictures 4 and 5. Depicting the powerhouse and a location halfway through to the intake. Construction works were performed at the time of the visit.



Minimizing the destruction of vegetation along the route of the pipeline and maintenance of the vegetation on the location

There is a lot of vegetation destroyed along the entire route of the pipeline, mostly for the purpose of widening the road so that the construction machinery can go through. A lot of trees that are along the edge of the road and don't particularly contribute to the accessibility of the road seem to be unnecessarily destroyed. Additionally, many of those are just pushed toward the river bed and create obstacles for the water flow.

Pictures 6 and 7. Unnecessary destruction of vegetation.



Pictures 8 and 9. A lot of trees are destroyed simply by reckless pushing of rocks and debris towards the river bed.



Reduction of waste generated by construction workers / Selection, reuse and recycling of particular waste types

Along the entire route of the construction works there are clear signs that the employees not only do not reduce the waste, but they also do not make sure it is properly treated. The types of waste range from plastic bottles to residues of construction materials.

The improper treatment contributes with additional pollution to the air, water and soil on the location.

Picture 10. Plastic bottles and bags on the riverbank.



Picture 11. Food cans and plastic bottles were burned just next to the small workers cabin.



In case of oil leaks the entire affected soil surface needs to be removed and properly treated

Picture 12. A location where probably maintenance on the construction machinery was performed. Hydraulic fluids and oil leaks are clearly left unattended and are not properly treated.



Prevention of disposal of waste near or in the surface waters and prevention of oil leaks or fuel from the vehicles

Picture 13. Cement bags were being disposed of directly into the river.



Avoidance of sedimentation near river crossings

Picture 14. Huge amounts of debris were dumped at the river crossing blocking the river flow and creating conditions for future sedimentation, especially during construction works when a lot of soil is flowing downstream.



Use of prefabricated toilets and their continuous maintenance

At none of the construction site prefabricated toilets were present.

Picture 15. The improvised workers cabin, equipped with one table for eating near the intake of the SHPP. The burned waste mentioned before can also be seen in the lower left corner of the picture.



As can be seen on the details from previous pictures, almost none of the construction practices and personal protection recommendations that ensure the safety of the workplace were implemented. The workers were not wearing any protective equipment and there was not a protective fence on the scaffolding.

Pictures 17 and 18. Details depicting construction workers without personal protection equipment.



5. Conclusions

The site of the SHPPs is part of an Emerald protected area and a potential Natura 2000 site. It is an important habitat and part of a migration route for the Balkan Lynx (*Lynx Lynx*), Brown Bear (*Ursus arctos*) and other endemic and endangered species. The surrounding caves have important populations of rare bats (*Rhinolophus euryale*, *Rhinolophus ferrumequinum*, *Rhinolophus hipposideros*) and the impact of the construction works and noise resulting from them on the bats was not assessed. The presence of unidentified blind fish in the underground lakes needs to be explored since their habitat is influenced by the soil and water pollution occurring during the construction works and documented in this report. The water from the river and other springs are contributing to many underground basins in the area and is used as drinking water in the Krapska village and other surrounding villages.

According to “EBRD Environmental and Social policy” this should have contributed to marking the SHPP Krapska reka as a category A project and as such a subject to an Environmental Impact Assessment (EIA) which was, to our knowledge, not conducted. Our understanding is that the EBRD has commissioned additional studies but since these are not publicly available we are not able to assess if the studies have identified any of the risks mentioned in this report and if any mitigation measures were proposed. Informed public consultations in the EIA process - from scoping to implementation of mitigation measures - have not been conducted either. The mitigation measures recommended in the Environmental elaborate are, in our view, insufficient. Further, as can be seen from the photo report, even these mitigation measures and good construction practices are not applied on the construction site which contributes to additional pollution to the environment and endangerment to the critical habitats that are part of the Krapska reka valley.

All this emphasizes the general impression that even the smallest SHPPs (below 1MW capacity) as is the case for Krapska reka can have significant adverse effects on the environment, especially if no proper assessments were conducted and the mitigation measures are insufficient and are not properly implemented. This can be improved only by completely excluding sensitive biodiversity areas as potential sites for SHPPs and if the EIA procedure is mandatory for all SHPP projects.

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