Preparation of Studies (FS, EIA, CBA), Design documentation and tender Dossiers for Waste Water Collection and Treatment Investment Projects in the Municipalities of Strumica, Bitola and Tetovo

NON – TECHNICAL SUMMARY

To the

ENVIRONMENTAL IMPACT ASSESSMENT STUDY

PROJECT FOR CONSTRUCTION OF A COLLECTION SYSTEM, REHABILITATIONS OF THE SEWERAGE NETWORK AND CONSTRUCTION OF WASTEWATER TREATMENT PLANT IN BITOLA

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A Project is implemented by NIRAS and its consortium partners
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Contents

1. Introduction

The process of evaluation of the environmental impacts and drafting a Study on the environment under the proposed project for the construction of the sewerage collection system, rehabilitation of sewerage network and construction of waste water treatment plant in Bitola represents a compulsory step in the process of obtaining construction approval. Its objective is assessment of the environmental impacts from the project implementation as well as anticipation of appropriate measures to prevent and control the impacts and achieve high degree of environmental protection.

The proposed project for construction of a collection system, rehabilitation of the sewerage network and construction of a wastewater treatment plant in Bitola is part of the activities provided in the Programme for water supply, drainage, collection and treatment of urban wastewater for the Bitola agglomeration which aims to solve infrastructural problems with water supply, collection and treatment of wastewater from the Bitola agglomeration. According to the legal obligations, the Programme itself as a planning document was a subject of a procedure for strategic environmental assessment, which ended with an approval from the competent authority. The Programme and the corresponding strategic environmental assessment report represent a part of the frame on which is prepared this Study.

In accordance with the Law on Environment (Official Gazette of RM no. 53/05, 81/05, 24/07, 159/08) the project on the construction of collection system, rehabilitation of the sewage network and construction of waste water treatment plant in Bitola is a type of project for whose implementation Assessment of the environmental impact of the project is required based on an appropriate Study.

The Study is designed in accordance with the requirements set out in the national legislation for environmental impact assessment (EIA), the scoping Decision, the Rulebook on the requirements to be met by the Study on the assessment of the environmental impact (Official Gazette of RM no. 33/2006) as well as the related guidelines. The Study is prepared based on Draft Feasibility Study on a wastewater investment project in the Bitola agglomeration.

The Study was prepared by a team of specialists in different areas relevant for the subject of this project. The preparation included field observations, environmental monitoring, impact dispersion modelling and as well application of Geographic Information Systems (GIS) in preparation of maps.

The project on the construction of collection system rehabilitation of the sewerage network as well as construction of waste water treatment plant in Bitola originates from a wider project and technical documentation developed within the project EuropeAid/133257/D/SER/MK - "Drafting of studies (FS, EIA, CBA), project documentation and bidding documents for the collection and treatment of waste waters, investment projects in the municipalities of Strumica, Bitola and Tetovo. It is in fact part of the overall national priority for reconstruction and modernization of the infrastructure of R. Macedonia, including the water management sector in accordance with the requirements and standards of the European Union (EU). This technical assistance for the project on waste waters for Bitola have been financed within the framework of the provisions of the Regulation (EC) no 1085/2006 of 2006/07/17 with the establishment of the Instrument for pre-accession (IPA).

The EIA study is prepared by a consultant team led by Mr. Marjan Mihajlov, graduated engineer in environmental studies, an EIA expert in charge of the preparation of the study.

The Ministry of Environment and Spatial Planning, and more specifically the Directorate for the environment is the competent body for the implementation of the procedure for EIA. After the submitted information on the intent for the above project, the Ministry of Environment and Spatial Planning informed the investor on the need for the implementation of the procedure EIA for the proposed project and specified the scope of the study. The study was based on the guidelines by the competent authority contained in the document on the defining the scope of

the study, as well as in accordance with the existing national and international guidelines for this type of projects.

2. Public involvement

The public participation in the EIA procedure is regulated by the Law on Environment (Official Gazette no. 53/05, 81/05, 24/07, 159/08, 83/09, 48/10, 124/10, 51 / 11, 123/12, 93/13, 187/13, 42/14, 44/15, 39/16). The public participation is practices by: a) disclosure of information to the public; b) public participation and an opportunity to submit opinions, comments; c) to justice when the public can influence decisions through appeals to the Court or secondary commission of the government.

Upon the submission of the notice of intention to implement the project, the MEPP issued a decision instructing the investor to prepare an EIA study and determined its scope. The notice together with the decision were published. Upon submission of the study, MEPP published an information that the study has been received and also made it publicly available for any comments. MEPP also announced information about the date and venue for the public hearing. The hearing was organized in the premises of the municipality of Bitola and the study was presented upon which there was Q&A session. Minutes of the public consultation are published on the MEPP. The study is subject to assessment by the MEPP (report on adequacy), which also is going to be published. Based on the opinions of the public and stakeholders, the report on the adequacy of the study and the public hearing, the MEPP will issue a decision to grant a consent to the application for project application. At the end, the decision for granting a consent for the project shall be published allowing submition of public objections within a given period.

3. Project description

3.1 Project location

It is envisioned that the project should be located on the territory of the municipality of Bitola, north from the city of Bitola, in the vicinity of the new cemetery, between the villages of Dolno and Gorno Orizari, on the following cadastre details КР 25, КО Bitola 5, municipality of Bitola.

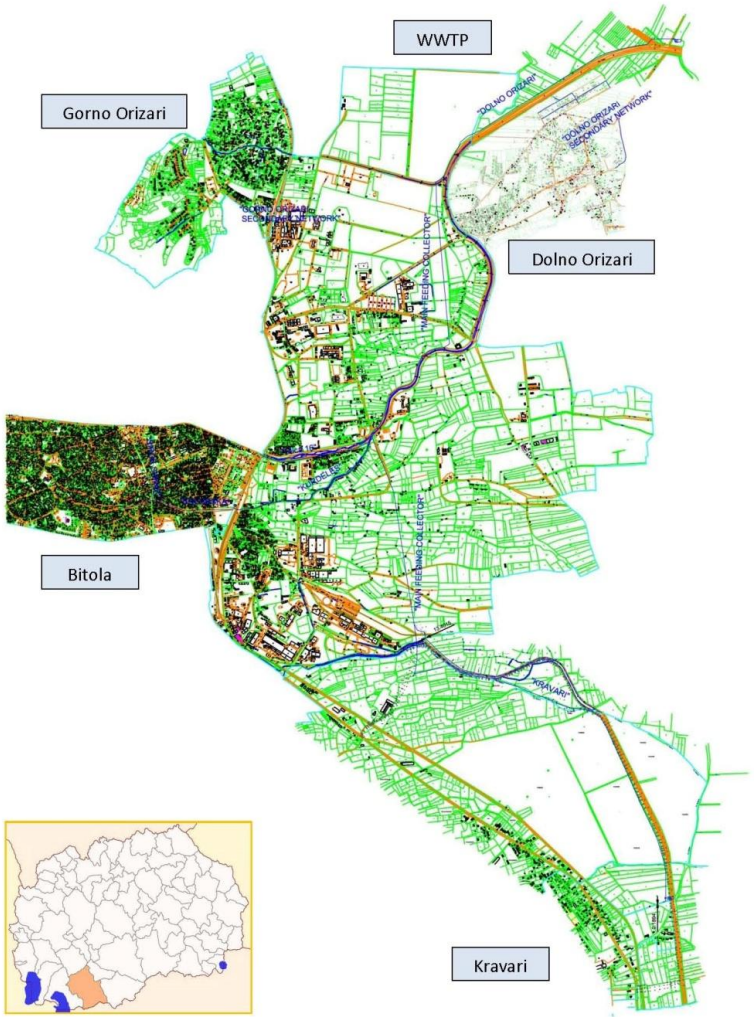

Figure 1 Location and scope of the project

3.2 Project components

The project envisions construction of collection system, rehabilitation of the sewerage network and building a waste water treatment plant in Bitola. Activities connected with the building and rehabilitation of the sewage systems include:

- Reconstruction of the sewage network in the village Gorno Orizari,
- Reconstruction of the part of the sewage network (collectors) in the city of Bitola,
- Construction of pump station and pressure pipes for the village Kravari to the main accepting collector on the point of connection with collector К1,
- Extension of the sewage network of the village Dolno Orizari and building of inclusive pressure pipes on the pump station to WWTP,
- Construction of inclusive pressure pipes of the pumps station WWPS К0 to the point of connection with К1 for the industrial zone (К0),
- Development of a major recipient – collection system for the development of the existing К0 of the WWTP.

The process of treatment of waste waters for the WWTP Bitola is "conventional process of treatment of active sludge" with secondary level of treatment of waste waters. The waste water treatment station/plant has been designed for 112 474 inhabitants.

WWTP will be designed and built in order to comply with the criteria for waste water release specified in the EU Directive for the treatment of urban waste waters (91/271/EEC), The legislation on the treatment of the urban waste waters (Official Gazette of 8 January 2006 and no. 26047) and by-law on the treatment of urban waste waters – Communication for sensitive and less sensitive water areas (Official Gazette of 27 June 2009 and no. 27.271). The sludge of the waste water treatment plant/station will be eliminated in accordance with the EU Directive on waste sludge (1986/278 / EEC). The following quality standards on the treated waste waters are required:

Table Quality standards for treated wastewaters

Parameter	Basic concentration of WWTP Bitola
БПК (BOD5)	25 mgBOD5/l
ХПК (COD)	125 mgCOD/l
Total suspended hard substances (SS)	35 mgSS/l
Total nitrogen (N)	10 mgN/l (future option)
Total phosphorus (P)	1 mgP/l (future option)

In order to enable treatment of the waste waters to the required quality, following processes are envisioned:

- Preliminary mechanical treatment,
- Primary treatment,
- Biological treatment with the use of the process of active sludge,
- Treatment of the sludge with anaerobic digestion.

4. Description of the environment

4.1 Air

Measurements of the air quality of the two monitoring stations in Bitola indicate that the concentration of polluting substances shows no significant difference between them. It implies that in many cases, the air quality can be a result of common sources of emission/air pollution. Thus it can be assumed that almost whole population in Bitola is exposed to the same level of polluting substances and that exceeding the upper critical values, in particular relating to PM10, affects the whole urban area. Among the most prominent polluting substances in Bitola are the suspended particles with a size reaching 10 micrometers - PM10 which exceed the daily and the annual upper critical values of the two monitoring stations. Rural areas are not subject to monitoring, but as expected they are characterized by higher air quality.

4.2 Noise

The most frequent main sources of noise in the municipality of Bitola include all types of vehicles, equipment and machines used in the industrial plants as well as farming machinery. Measurement of the communal noise that affects the population in Bitola is covered by the network of the Centre of public health – Bitola. The level of noise exceeds the GV on the most frequented streets. The communal level of noise envisioned for the WWTP is 45 dB, according to the previous monitoring.

4.3 Waters

In terms of the sanitary hygienic situation of the major recipient, River Dragor, in accordance with the Directive on water classification (Official Gazette of RM no. 18/99 and 71/99), waters of the river Dragor are class II, before entering the city of Bitola and class IV at the town exit, as a result of high organic pollution from the households and industry. River Dragor from the city of Bitola to the river mouth of River Crna Reka is a completely dead river, with no living organisms. Following the result of the physical-chemical analysis of the composite sample of water, taken from a place where outflow is envisioned of the treated waste waters from WWTP Bitola for the parameters given, the surface waters of river Dragor on the point of outflow have the characteristics of class V.

4.4 Geographic and biological diversity and natural heritage

Geographic characteristics of the micro location in the immediate proximity of the Waste Water Treatment Plant are in fact the features of the wider region. On the east the area is a flat land, divided into numerous plough field, used exclusively for annual crops. The area is almost bare, divided into numerous fields out of which some are used for farming, other are transformed to fallow land, while the third group are deserted. Biodiversity of the immediate proximity of the WWTP is identical with the biodiversity characteristic for the lower lowland part of Pelagonija.

The project location[1]) is not located within the areas of importance for nature conservation. The project location in near to 1) identified prime butterfly area Baba mountain, 2) Emerald area Pelister and 3) national Park IPA Pelister and and 4) identified important bird area Pelagonija (Figure 27). On its west side, the project location nearly borders with the wider area of prime butterfly area Baba mountain. On the same west side, the project location is near to an Emerald area Pelister, with a closest distance of about 2,5 km. Also, on the same side, the projec location is near to national park and IPA Pelister, with ea closest distance of about 3 km. On the east side, the project location (i.e. WWTP location and the area of village of Kravari) is near to an identified important bird area (IBA) Pelagonija, with closest distance of about 0,5 - 1 km.

[1] Project location = includes location of WWTP, sewerage and collection systems.

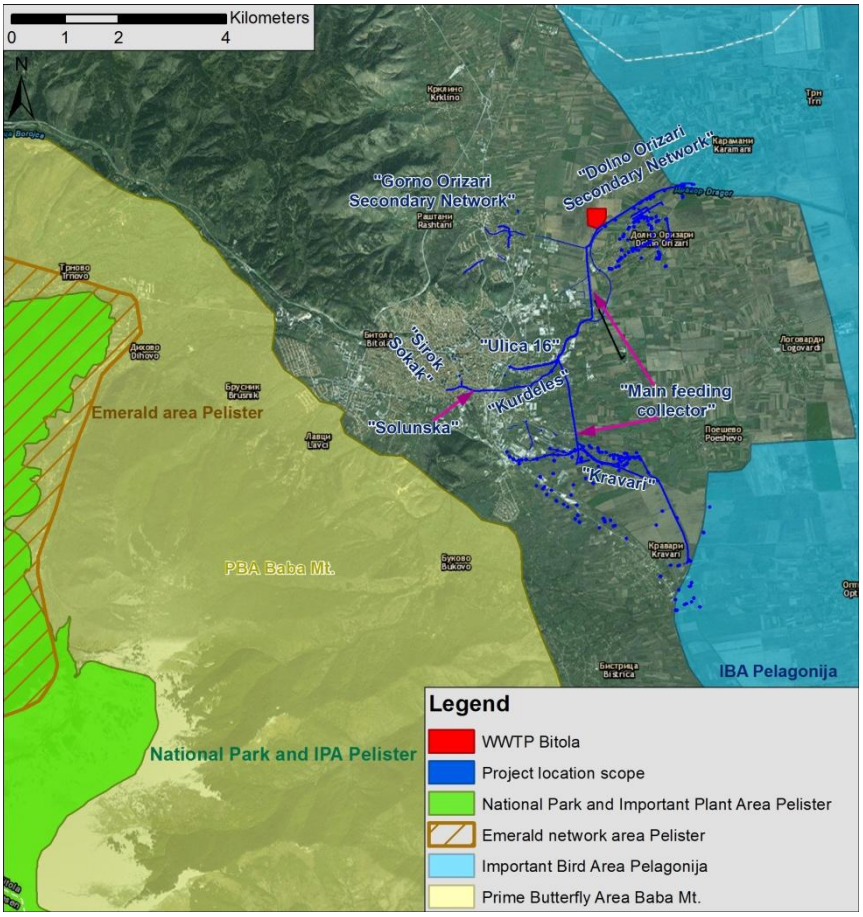

Figure 2 Project location[2] in regards to protected and important areas

4.5 Cultural heritage

Bitola has rich cultural and natural heritage. The town of Bitola belongs to the category of towns with visible layers of old building experiences with all elements of various modern influences. Preserved profane architecture from the late 19th and early 20th century remains an impressive reflection of the urban image of Bitola. Buildings in Bitola dated from periods that maintains the Macedonian renesance throughout its style features and sublimates the local building ideas and infulences of the western European architecture.

The broader area of Bitola region is identified by the following cultural heritage:

- Shirok sokak (which means "Wide Street") is a long pedestrian street that runs from Magnolia Square to the City Park.
- Covered Market - built in the 15th century
- Old Bazaar in downtown area
- Heraklea Lyncestis

There are few hundred of monuments of cultures in the city of Bitola. In 2015, a Law on the old city kernel was adopted, introducing more rigorous regime of protection. Shirok sokak has a status of national protected monument of culture and also is one of the complexes included with the new regime.

[2] The location of the project (agglomeration Bitola) is presented indicatively.

5. Potential sources of impact and measures

The environmental impact as a result of the proposed project is identified and addressed in this study following the requirements of the Macedonian legislation of EIA, best international practices in the area and the guidelines in the report on the defining of the scope of EIA submitted by the Ministry of the Environment and Spatial planning. The results of this study do not indicate any significant negative impact on the environment and the health of the people. The identified impact is part of the standardized impact and it can be avoided or reduced through implementation of defined protection measures.

5.1 Air

The project implementation includes a phase focusing on construction works envisioned for the activities relating to construction of sewage collection system, rehabilitation of sewage network and building of waste water treatment plant for the waste waters. Construction works will include work on land and concrete, movement of transport vehicles and construction machinery, manipulation with granulates etc. They represent major sources of air emission/pollution in this phase. Emissions include primarily dust, while the second are from the fuel burning. Some of the activities will be realized in urban areas (Bitola), and other in rural areas.

Activities connected with rehabilitation of the sewage networks are more significant because they will be implemented in urban areas where in addition to commercial there are residential areas.

Implementation of construction activities in urban areas (Bitola) are even more significant if the identified high levels of contaminating substances in the air are considered as well as the exceeding of the upper critical values (for the parameter dust for instance). This implies a significantly reduced and exhausted absorption capacity of the ambient air and the potential cumulative impact in course of the construction activities in urban areas. Potential cumulative influences would have micro location character, and would potentially refer only to locations of the construction activities. Control measures therefore should be more extensive.

The review of the sources of emission (air pollution) and emissions as a result of the project implementation in its operational stage has been completed. The major types of emissions as a result of these type of activities include organic odorous components (sulphurhydride H_2S, mercaptan etc.), evaporating organic compounds (carbohydrides) and bioaerosols. These emissions derive from several scattered points and diffuse sources. Additionally, activities of burning for the needs of the project represent a source of oxides from burning and they vary depending on the type of the fuel.

In order to control the impact, in the construction phase, a set of measures has been adopted, which mainly represent good construction practice and are under the responsibility of the implementer of the construction works. The measures in the operational stage can be divided into urban, project designing, technical, administrative, good working practice etc., while the accountability in terms of implementation is mainly the operator of WWTP.

5.2 Environmental odour

The occurrence of unpleasant environmental odour is connected with the potential emissions of organic odorous components containing compounds of sulphur and nitrogen present in the waste waters, such as sulphurhydride and ammonia. Several potential sources of emission of smell/unpleasant odour have been identified on the location of WWTP, out of which 3 are pointed (directed) while the remaining sources are diffuse or surface.

To assess the potential impact of smell/odour, quantitative analysis has been completed on the smell/unpleasant odour emissions. Emission factors and the intensity of emissions have been identified on the basis of the proposed parameters, while modelling as a method was used to identify the zones of dispersion of smell/unpleasant odour, in order to assess more efficiently

the effects on the immediate environment, as well as the measures needed for control and protection.

This analysis indicates that odour emissions are insignificant and have only temporary and local significance, while higher concentrations (equal to the ambient norms, outside the zone of the facility should not be expected in any case. Environmental impact control shall be ensured with the implementation of a set of measures which in most cases overlap with those referring to the emissions in the air, as a result of their connectedness.

5.3 Waters

Establishing of the construction zones and development of the infrastructure can affect the quality of the soil as well as the surface and the ground waters only in cases of an incident and irregular management and treatment of materials and equipment. Control measures generally include the application of the good construction practice.

The work of WWTP Bitola is not expected to have negative hydrological influence on the recipient, the Dragor River, not on the profile of outflow, nor the inflow. According to the project the outflow will be designed and implemented in a way to prevent any hydrological and erosive impact on the recipient on the point of outflow and the river bed.

Depending on the scope and conditions, the industrial technological waste waters released in the communal sewage can affect the work process and the equipment of WWTP, the quality of sludge and waste waters, which resulted in the adoption of several measures for control and monitoring of the impact.

The project implementation as well as the release of the treated waste waters will mean the beginning of a process of water quality improvement of the river Dragor. In long term perspective it would mean improvement of the class/level of the waters in the river Vardar.

In the analysis of the potential cross-border influence from this aspect, several factors have been considered as potential influence: the recipient, place of release, the course of the river, length up to the end of the national borders. Considering all this factors, it can be concluded with certainty that there is no significant impact expected over the national borders as a result of the project implementation.

To control the impact, a series of measures have been proposed, and they are a responsibility of the operator of WWTP, but also operators of other industrial plants, generators of industrial waste waters and competent bodies in the part of the effective supervision.

5.4 Noise

Major sources of dangerous noise during the phase of construction, including transport and installation of equipment, are the construction machines and equipment as well as the procedures for handling construction materials. Construction activities will be implemented in rural, but also urban areas where the environment – recipient is more sensitive. If we consider the fact that the operation of the above sources is not permanent, generating of dangerous noise will not be occasional and is not expected to cause significant impact on the environment and local population. Taking appropriate standardized operational activities and measures during the construction works will enable harmonization of the levels of noise with the critical values of emission.

In the operational stage, the noise is connected only with the work of the future WWTP Bitola, where several sources of noise have been identified and they include part of the equipment and processes of work. The project includes appropriate technical decisions to enable control of the impact and avoidance of exceeding the permitted levels of noise with the most immediate recipients.

5.5 Waste

Sources of waste in the construction phase are the construction activities and all the relating operation of equipment and labour force.In the operations phase, the main source of waste is only the activity of the wastewater treatment (WWTP) with all processes that are scheduled to take place on the site. Another small source of waste are the pumping stations, while the municipal wastewater is passing through the finer grids there will be waste.

The Project foresees appropriate waste management measures, in terms of collection, storage and disposal, thus preventing adverse environmental impact during the operation of the WWTP.

Short - term solution for the entire WWTP waste is disposal to the municipal landfill Meglenci, located about 20 km to the north-east from the city of Bitola, in a hilly landscape of the Gradište-Brajinac mountain. The nearest settlement, Meglenci, is at a distance of about 1.5 km from the landfill. The company responsible for waste collection in Bitola is the "Komunalec" public utilities enterprise.

The construction of the regional sanitary landfill will be in line with EU standards and national requirements, so the option of sludge disposal to a sanitary landfill will be significantly limited in terms of quantity. Hence the importance for analysis of the opportunities and the needs to use the treated sludge so a long-term solutions can be identified in near future. This is a responsibility of the municipality of Bitola.

5.6 Biological and geographic diversity

Having in mind the detailed description of the biological and landscape diversity in the project area and the quality of the environment in contrast to the nature and the character of the project, the conclusion can be drawn that its implementation is not expected to have a significant impact on the biological and landscape diversity. This project location does not affect any Emerald areas, protected areas with national status or areas of international importance. In this regards it should be noted that Macedonia has not established yet Natura 2000 ecological network. The conclusion refers in particular to the portion of activities that are envisaged to be carried out in rural areas (in contrast to the ones anticipated for the urban areas, which are almost irrelevant for this issue).

5.7 Cultural heritage

Part of the project construction activities refer to the City of Bitola, in particular in the central area where numerous monuments of culture with a national protection status are located. Furthermore, the new Law on the old city kernel brought a more stringent protection regime to the central area. The reconstruction of part of the sewerage network (collectors) in the City of Bitola involves a collector on Shirok sokak with a total length of 356 m to be constructed.

All activities must be implemented with a prior notice to the relevant competent authority, National Administration for cultural heritage and the Institute for Protection of Cultural Monuments and Museum in Bitola, and in accordance to their specific instructions.

6. Impact summary

The table given bellow makes a summary of the identified impacts and their significance.

Potential impact	Recipient sensitivity		Impact magnitude		Impact significance	
	Urban	Rural	Urban	Rural	Urban	Rural
Air, construction phase	Medium	Low	Low	Low	Minor	Neutral or minor
Air, operational phase	No changes	Low	/	Medium	Neutral or minor	Minor
Odour, construction phase	Medium	Low	Negligible	Negligible	Neutral or minor	Neutral or minor

Potential impact	Recipient sensitivity		Impact magnitude		Impact significance	
	Urban	Rural	Urban	Rural	Urban	Rural
Odour, operational phase	/	Low	/	Medium	/	Minor
Noise, construction phase	Medium	Low	Medium	Medium	Medium	Minor
Noise, operational phase	/	Low	/	Medium	/	Minor
Waste, construction phase	Low	Low	Low	Low	Neutral or minor	Neutral or minor
Waste, operational phase	No changes	Medium	No changes	Medium	/	Medium
Water, construction phase	Low	Low	Negligible	Negligible	Neutral or minor	Neutral or minor
Water, operational phase	No changes	Medium	No changes	Medium (positive)	Neutral	Medium (positive)
Biodiversity, construction phase	Negligible	Low	Negligible	Low	Neutral	Neutral or minor
Biodiversity, operational phase	Negligible	Low	No changes	Medium (positive)	Neutral	Neutral or minor
Risk from incidents, construction phase	Low	Low	Low	Low	Neutral or minor	Neutral or minor
Risk from incidents, operational phase	No changes	Low	No changes	Low	Neutral	Neutral or minor
Cultural heritage, construction phase	High	Negligible	Minor	Low	Minor	Neutral
Cultural heritage, operational phase	/	/	/	/	/	/
Social and economic	Low	Low	Medium	Medium	Minor	Minor

7. Environmental management and monitoring

Environmental management includes design and implementation of a systematic way of management of all issues relating to the environment. For that purpose, a Management plan together with an Action plan[3] is prepared consisting of measures on reduction and prevention as well as monitoring in order to prevent the negative environmental impact to the highest possible degree and control and attain high degree of environmental protection. The major aim of the plan is to ensure that all the project components will be implemented in accordance with the national legislation on the environment.

The plan is concise and clear and practicable. It includes the aspects of measures for prevention and reduction of the influences and monitoring of the implementation process as well as Monitoring of the environment.

In order to provide confirmation of the effectiveness and efficiency of the measures to protect the environment identified in this study, and possibly identify the need for their revision and amendment, an Environmental Monitoring Plan is prepared as part of this study.

[3] Action plan for environmental protection and monitoring of the implementation of measures

8. Conclusion

According to the obligations set out in the Law on Environment, the project investor has initiated a procedure for an environmental impact assessment and has prepare a study for the planned activity for construction of a collection system, rehabilitation of the sewerage network, and construction of a wastewater treatment plant in Bitola. The purpose of this study and the procedure is to evaluate the impact of the project in all its phases, starting with the planning, then the design, the operational phase, and due care after the decommissioning.

The Project for building a collection system, rehabilitation of the sewerage network, and construction of a wastewater treatment plan in Bitola is part of the overall national priority for reconstruction and modernisation of the infrastructure in Macedonia, including the water sector as per the requirements and standards of the European Union (EU). This technical assistance for preparation of the Bitola wastewater Project is financed within the provisions of Regulation (EC) no. 1085/2006 of 2006/07/17 and the establishment of the Instrument for Pre-Accession Assistance (IPA).

Within the Study, a cross-section of the general condition of the environmental media and sectors was prepared, potential impacts arising from the Project implementation were determined and assessed, and adequate prevention and control measures were envisaged, for the purpose of achieving high level environmental protection.

The environmental impacts related to the proposed Project were identified and addressed in this Study, as per the requirements of the Macedonian EIA regulations, best international practices and the guidelines from the Report on determining the EIA scope, submitted by the Ministry of Environment and Physical Planning. During the preparation of this Study, no significant negative impacts on the environment and the human health were determined. Identified impacts are within the standard impacts that may be avoided or mitigated by implementing the identified protective measures. In doing so, it is necessary to particularly focus on managing the sludge resulting from the wastewater treatment process. Short-term sludge solution is deposing it at the municipal landfill, as final removal measure. Taking into account that the future regional sanitary landfill will be restricted at receiving biodegradable waster, a long-term sludge solution is necessary. Considering that this waste is specific for this kind of activities, and it may be also expected to a larger extent in the remaining treatment plants in Macedonia in the future, a national sludge solution may be considered.

In accordance with the conducted analyses, general assessment of the Study is that the Project implementation is no threat to the environment or the nature, that is to say, it is not expected to have a significant impact, and its work is justified if implemented in accordance with the regulations for this kind of projects and with the measures envisaged in this Study.

The purpose of adopting and implementing the proposed measures set in the Management Plan is to prevent and control, to a largest possible extent, the negative impacts and achieve a high level of environmental protection. Its full implementation is responsibility of the Project investor.

Successful implementation of the Project will result in significant long-term impacts on the environment, but also on the socio-economic situation in the region.