Summary of Environmental and Social Considerations in Development Study
(Preparatory Study)

1. **Project Title:** The Study on Wastewater Management in Skopje in the Former Yugoslav Republic of Macedonia

2. **Type of Study:** Feasibility Study

3. **Environmental and Social Consideration Category:** A

   (1) The project involves the construction of a wastewater treatment plant with a capacity for 500,000 inhabitants (The Macedonian side has earmarked the required land in the village of Trubarevo). The wastewater discharged into the Vardar River may affect the riverwater quality. Also, construction of a new collection facility may involve involuntary resettlement. Furthermore, although it is currently assumed that sludge disposal will take place at the existing landfill in Drisla, if the Macedonian side should construct a new landfill for sludge disposal, it may involve involuntary resettlement.

   (2) Based on “Sectorial EIA Guidelines: Waste Water Treatment Plant”, the project will require an environmental impact assessment according to the laws and regulations of Macedonia.

   (3) Water flow may decrease in portions of the Vardar River, from the current sewage disposal point to the disposal point for processed water from the treatment plant. There may be higher concentrations of wastewater pollutants from industries outside the scope of this project.

   (4) The water quality of the Vardar River is expected to improve with the establishment of the new sewerage facilities by City of Skopje.

4. **Institutions Responsible for Project Implementation**
   - Ministry of Transport and Communications
   - Ministry of Environment and Physical Planning (MEPP)
   - City of Skopje
   - Public Enterprise: Water Supply and Sewerage Skopje
5. Project Outline (see Attachment 1 for details)

Study Objectives:
The objective of the study is to improve the water quality of the Vardar River through the following measures:
(1) Developing a basic plan for wastewater management
(2) Conducting a feasibility study for sewerage facilities, including a sewerage treatment plant
(3) Developing action plans for improving institutional and financial systems
(4) Developing action plan for industrial wastewater management and monitoring wastewater quality

Project Objective:
As mentioned in item (2) of the Project Outline, the project objective is to conduct a feasibility study for sewerage facilities.

Justification:
• Outlook: The City of Skopje, with a rising population of approximately 500 thousand people, is the most important city of Macedonia and the center of the country’s economy and industry. Sewerage facilities are established separately for sewage and for storm water with an 80 percent spread for the collection facilities; nevertheless, a sewerage treatment plant is not yet in place. Skopje is facing problems stemming from with a malfunctioning collection network, the direct drainage of household and industrial wastewater to collection channels and rivers, and the inadequate operation of pumping stations and the central collector duct, among others. The drainage of these polluted waters to the Vardar River, which flows across the city and is Macedonia’s largest international river, is contaminating the watershed, leading to the degradation of the environment and an increased risk to public health downstream. In November 1999, a master plan was formulated with the assistance of the EU (PHARE: Report on Wastewater Management System for Skopje, November 1999) for a sewerage system for the City of Skopje, and a sewerage facility analysis was conducted based on its results; however, because the inherent feasibility study was not
implemented, no treatment plant was constructed. Instead, the collection network was developed for a few kilometers over the course of a year. On the other hand, the Macedonian side is urged to formulate its legal system in regards to environmental protection by adapting EU directives as a condition for its accession to the Union. Given this background, the City of Skopje requires basic reforms and revisions of its former plans, making strategies for integrated sewerage management while taking into consideration future implementation of sewerage facilities, enhanced administrative efficiency and rationalization, and the improvement of those systems related to water environment management.

- **Relevance to the Macedonian government policy:** With an eye on acceding to the European Union, in June 2005 the Macedonian government established and enacted its Law on Environment in compliance with EU directives. At present the government is promoting environmental protection measures including those dealing with water resources, and is developing a Law on Waters. Furthermore, the National Environmental Action Plan 2 was formulated in 2006, establishing concrete improvement plans for the sectors of water resources, water supply and sewage, industrial water, wastewater treatment, and the like by 2011. In the sewerage sector, objectives are stipulated relating to the implementation of sewerage facilities, development of institutional capacity for sewerage system management, improvement of riverwater quality, etcetera. Expectations are high for the realization of the inherent basic and feasibility studies, in line with the Action Plan that includes the implementation of Skopje’s sewerage facility.

- **Consistency with related activities of other donors:** The implementation of sewerage facilities in Macedonia had previously been centralized on the local settlements, principally with the assistance of the EU and bilateral cooperation from European countries. Until now, however, cooperation in the City of Skopje consisted of the EU master plan mentioned earlier and feasibility reports carried out by Norway for sewerage treatment facilities in the villages of Saraj and Novo Selo. Carrying out this study requires the revision of existing data gathered for the EU master plan and the preparation of a plan suited to current conditions.
Location:
The study area is those portions of the City of Skopje covered by the “2002 G.U.P. (Generalen Urbanisticki Plan: General Urban Development Plan)”, which has a target year of 2020. The feasibility study stipulated in the Scope of Work covers only the highest-priority area and the treatment facility to be constructed in the vicinity of Trubarevo Village.

Proposed activities:
The proposed plan includes conducting a field survey at the construction site in the village of Trubarevo, as well as surveys on topographic, geophysical, and environmental matters (including bodies of water, fauna and flora, landscape, land usage, water rights, and social aspects); designing sewerage facilities; formulating a construction plan and a procurement plan; formulating an operation maintenance plan; estimating the project cost; conducting an environmental and social consideration survey (at the EIA level); and evaluating the project by its economical, financial, technical, social, and environmental aspects.

Scope of the Study:
The study will consider the City of Skopje’s existing urban development plan for the year 2020 as developed by the city in 2002. The study will refer to the rules and standards stipulated by EU directives and the Macedonian legislation. The study will also feature a sludge disposal plan, including a study on the possibility of a clean development mechanism application.

6. Legal Framework of Environmental and Social Considerations
(1) Relative laws, regulations and standards:
• Law on Environment (O.G. 53/2005)
• Law on Water (O.G. 4/1998)
• The UNECE Convention on Environmental Impact Assessment (EIA) in a Transboundary Context
• Guidance for conducting screening, scoping, and review in environmental impact assessment in the Republic of Macedonia
• Sectorial EIA Guidelines - Waste Water Treatment Plant
• Sectorial EIA Guidelines – Landfills

(2) Relative agencies and institutions
• Ministry of Transport and Communications
• Ministry of Environment and Physical Planning(MEPP)
• Ministry of Agriculture, Forestry and Water Economy
• Ministry of Economy
• Ministry of Local Self-Governance
• City of Skopje
Environmental impact assessment (EIA)

Macedonia’s environmental impact assessment program is regulated by Clause XI of the Law on Environment, “Environmental Impact Assessment of Independent Projects”. The EIA process for independent projects entails screening, scoping, assessment, and an evaluation of the impact on the environment if the project is implemented or not implemented.

The plan proponent must confer with the MEPP regarding the necessity of performing an EIA. The aforementioned scoping process must be carried out within 30 days, with MEPP communicating the results to the plan proponent. Furthermore, MEPP must make said results public in a national Macedonian newspaper or on MEPP’s Internet homepage. The plan proponent can appeal the EIA results to the central government’s Second Instance Commission within eight days.

When the plan proponent submits a letter of intent regarding the implementation of said plan, MEPP must issue its conditions for EIA scoping, as determined by EIA experts appointed by MEPP. EIA experts, like SEA experts, are under MEPP administration; they must have graduated from a university with a specialization in natural science, they must have technical knowledge in the field of environmental conservation, and they must have at least five years of experience in their specialty to qualify for appointment to the EIA position.

The following elements are to be taken into account during the scoping process:

- Consideration of alternative plans
- Implementation of basic surveys and/or research
- Explanation of impact assumption methods and/or standards
- Introduction of remedial measures to be taken into account
- Introduction of legal advisory agencies
- Format, content, and scope of environmental data

The plan proponent must submit a paper environmental impact assessment report along with an electronic copy, in accordance with the scoping conditions. As the party responsible for said report, the proponent has the obligation to select a MEPP-certified EIA expert. If the contents of the EIA report do not satisfy the scoping conditions, MEPP may ask the plan proponent to provide cor-
rected or additional information. In this case, the plan proponent is granted a maximum of 40 days during which to correct and/or supplement, then submit the revised report.

Having received the EIA report, MEPP must make its contents public in a national Macedonian newspaper or on MEPP’s Internet homepage within five days. Any citizen may offer his or her written opinion on the report’s contents within 30 days of their publish date.

MEPP appoints an EIA expert to review the received EIA report; the expert has 60 days to produce an adequacy report reflecting the contents of any written opinions received. However, if the stated conditions were especially complex, this deadline may be extended by up to 30 days. The adequacy report touches on the following points:

- Prevention of harmful effects expected at the plan implementation stage
- Introduction of provisions to prevent, inhibit, or mitigate harmful effects
- Improvement or remedy of positive effects expected with plan implementation
- Evaluation of effects expected from proposed provisions

Up to five days before the review is complete, MEPP holds a public hearing to explain the plan details. The public hearing must be recorded in written minutes and on audiovisual media; these recordings must be published on MEPP’s Internet homepage.

Within five days of the adequacy report’s completion, MEPP must communicate the contents of said adequacy report to the plan proponent as well as make its contents public in a national Macedonian newspaper or on MEPP’s Internet homepage. The public and private sectors can appeal the report’s contents to the Second Instance Commission within 15 days.

Pursuant to the contents of the final adequacy report, MEPP must communicate its approval or rejection of the submitted plan implementation. If the plan is approved, a two-year authorization period is granted during which the plan proponent must carry out the plan.
In Macedonia, as laid out in EU guidelines, plans for wastewater treatment plants capable of operating on behalf of a population exceeding 150 thousand (according to Council Directive 91/271/EEC) are subject to the EIA process. Furthermore, plans for wastewater treatment plants capable of operating on behalf of a population exceeding 10 thousand are subject to the same treatment at Macedonia’s discretion.

7. Alternatives to the project activities

Alternatives, including enhancement of sewerage treatment facilities and a “no project” option, will be analyzed in detail during the inception stage of the study. A provisional analysis is shown in Table 1.

Table 1: Comparison of environmental and social impacts between the alternatives

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Impact on watershed environment</th>
<th>Impact on terrestrial and aerial environment</th>
<th>Impact on social environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sewerage treatment facility</td>
<td>Improved Vardar River water and riverbed quality along the city of Skopje and downstream. In some areas, along the intervals of actual sewage draining points and the treated water discharge point, the water flow volume will decrease, causing a rise in the concentration of industrial wastewater pollutants and degrading the water quality.</td>
<td>Slight disturbances affected by the construction of a pipe network to connect to the treatment plant and for the construction of the plant itself in the village of Trubarevo.</td>
<td>Costs raised by investment depreciation, as well as the operation and maintenance costs, will be charged to the users.</td>
</tr>
<tr>
<td>Final disposal of sludge in Drisla landfill</td>
<td>Leachate generation may contaminate groundwater at landfill site.</td>
<td>The life of the landfill will be shortened. Transport of sludge will increase energy consumption.</td>
<td>The introduction of a new type of waste to the landfill will require consensus between waste management corporations and other relevant parties.</td>
</tr>
<tr>
<td>Final disposal of sludge in a new landfill</td>
<td>Leachate generation may contaminate groundwater at landfill site.</td>
<td>Land use in the selected area will be restricted to sludge disposal. Transport of sludge will increase energy consumption.</td>
<td>Involuntary resettlement can be taken to establish the site. NIMBY effect can be more drastic due to the development of a new disposal area.</td>
</tr>
</tbody>
</table>
8. Result of stakeholder meetings

No stakeholder meeting was held during the Preparatory Study. However, the implementing institutions (Ministry of Transport and Communications, MEPP, and City of Skopje) have agreed to hold a stakeholder meeting as laid out in the Scope of Work signed between the Macedonian authorities and JICA, as part of the Environmental and Social Consideration Study.

9. Scoping of environmental and social impact study

Major environmental effects include the offensive odors generated at the sewerage treatment plant sludge treatment and disposal, and the higher concentrations of industrial wastewater pollutants and degraded water quality due to a drop in flow volume in portions of the Vardar River from the current sewage disposal point to the sewerage treatment plant. Social effects include the possible involuntary resettlement that may occur if a new landfill is constructed for sludge disposal and the increased financial burden of investments related to project implementation as well as facility operation costs.
### Table 2: Environmental and social effects of constructing a sewerage treatment plant in the village of Trubarevo

<table>
<thead>
<tr>
<th>Effect</th>
<th>Threat</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air pollution</td>
<td>B</td>
<td>Construction and operation of the treatment plant may increase levels of exhaust and suspended particulate. However, there is no natural or artificial structure to prevent this diffusion, and the effect may be alleviated to some extent by careful alignment. Exhaust and suspended particulate may be lessened if methane gas is recovered from the sludge and used for energy generation. Transport of sludge from the sewerage treatment plant to the disposal site will increase energy consumption and thus the emission of combustion gases into the air.</td>
</tr>
<tr>
<td>Water pollution</td>
<td>C</td>
<td>Construction of the treatment plant will considerably improve the quality of the wastewater discharged to the Vardar River. Nevertheless, the small amounts of chemical reagents added for coagulation and flocculation during the treatment process that are unable to be separated from the sludge will slightly affect riverwater quality. In case of mixing of industrial effluents and storm water containing toxic substances into the wastewater collecting system, the treatment efficiency of can be deteriorated causing water pollution.</td>
</tr>
<tr>
<td>Soil pollution/ pollution caused by contaminated sludge</td>
<td>B</td>
<td>Sludge can be contaminated by industrial effluents and storm water containing toxic substances that are mixed into the sewage collecting system. If the sludge is not pretreated prior to disposal, it may contaminate the landfill site.</td>
</tr>
<tr>
<td>Waste</td>
<td>B</td>
<td>The treatment plant will generate a considerable amount of waste in the form of sludge. This sludge must be disposed of at a non-hazardous waste disposal landfill. Nevertheless, depending on the quality of the sludge, it could be used as fertilizer and as filler material for landfills.</td>
</tr>
<tr>
<td>Noise and vibration</td>
<td>C</td>
<td>The construction and operation of the treatment plant will generate a considerable amount of noise and vibration. However, the site selected for its installation, the village of Trubarevo, is sparsely populated. Mitigation measures must be taken in accordance with relevant laws and regulations.</td>
</tr>
<tr>
<td>Ground subsidence</td>
<td>C</td>
<td>The specified area is entirely situated over an alluvial sediment formation. The area already contains a metal structure for electricity transmission and is bordered to the northern side by a railway. It is estimated that the land can withstand civil structures; geophysical surveys of the area are under consideration in order to assure the physical stability of the site.</td>
</tr>
<tr>
<td>Offensive odors</td>
<td>B</td>
<td>The operation of the treatment plant and the transportation of sludge to its final disposal site can affect the vicinity with offensive odors. The use of a digesting treatment before disposal can considerably lessen these odors.</td>
</tr>
<tr>
<td>Geographical features</td>
<td>C</td>
<td>The construction of the treatment plant may slightly alter the geographical features of the surrounding area. However, a railway and a sand and gravel factory have already been installed. The surrounding land is used almost exclusively for industrial purposes with no intermixing among extant factories.</td>
</tr>
<tr>
<td>Effect</td>
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</tr>
<tr>
<td>-----------------------------------</td>
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</tr>
<tr>
<td>Bottom sediment</td>
<td>C</td>
<td>The operation of the sewerage treatment plant will improve the bottom sediment of the Vardar River via the separation of suspended solids. Nevertheless, the small amounts of chemical reagents added for coagulation and flocculation during the treatment process that are unable to be separated from the sludge will slightly affect riverwater quality, and portions of these reagents may be deposited to the riverbed. Mixing together industrial effluents and storm water containing toxic substances into the wastewater collection system can degrade treatment efficiency, causing water pollution and the deposition of non-separated substances at the treatment plant (e.g., heavy metals). This situation can occur in highest concentrations at the discharge point of the Trubarevo treatment plant.</td>
</tr>
<tr>
<td>Wildlife and ecosystem</td>
<td>C</td>
<td>It is unknown whether endangered species exist in the specified area. It does not belong to any conservation areas.</td>
</tr>
<tr>
<td>Water usage</td>
<td>C</td>
<td>Water usage for treatment plant processes is insignificant. In that sense, the effect on the surrounding water requirements will be minimal. Furthermore, the Vardar River in Trubarevo is being used as a discharge point for untreated sewage and industrial effluent.</td>
</tr>
<tr>
<td>Accidents</td>
<td>C</td>
<td>The construction and operation of the treatment plant may lead to an increase in worker and traffic accidents.</td>
</tr>
<tr>
<td>Global warming</td>
<td>B</td>
<td>The project does not involve the destruction of large carbon sinks, such as forests, mangroves, or coral reefs. The construction and operation of the treatment plant and the transportation of sludge will lead to an increase in energy consumption. Recovering methane for energy use can mitigate the generation of greenhouse gases. The amount of methane gas generated at the sludge disposal landfill should be comparatively equivalent to the actual sludge accumulating on the riverbed.</td>
</tr>
<tr>
<td>Involuntary resettlement</td>
<td>A</td>
<td>While there are currently no inhabitants of the specified treatment plant site in Trubarevo, the project can cause involuntary resettlement if prolonging the sewerage system pipeline requires passing through private properties. This involuntary resettlement should be avoided or minimized by planning pipeline installation for public areas. Considerable involuntary resettlement may occur if a new landfill is constructed for sludge disposal. This situation can be avoided if sludge disposal is permitted at the extant Drisla waste disposal site; negative impact can also be minimized by planning the construction in a public/private-owned area with low population density.</td>
</tr>
<tr>
<td>Local economy, such as employment and livelihoods, etc.</td>
<td>C</td>
<td>Construction of the treatment plant and the sewerage system pipe network may temporarily affect the city’s local business and transport system during its installation.</td>
</tr>
<tr>
<td>Land use and utilization of local resources</td>
<td>B</td>
<td>Local administration bodies (e.g., the municipality of Gazibaha) may have different plans for land use and the utilization of local resources. The study must implement public consultation from the early stages and incorporate the needs of local communities.</td>
</tr>
<tr>
<td>Social institutions such as social infrastructure and local decision-making institutions</td>
<td>C</td>
<td>There are several actors involved in the project, and coordination among the local society is crucial. The project must respect and accommodate social institutions, as well as coordinate with relevant institutions/sectors/departments.</td>
</tr>
<tr>
<td>Existing social infrastructures and services</td>
<td>C</td>
<td>Social infrastructures including district offices, schools, and hospitals are present on both sides of the river. Therefore, the elongation of the pipe network system will have a slight impact.</td>
</tr>
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</table>
Socially vulnerable groups

A The implementation of this project, especially if a new landfill is constructed for the final disposal of sludge, may result in the involuntary resettlement of socially vulnerable groups, such as Roma and other undocumented inhabitants. (At present, sludge disposal is expected to occur at an existing landfill.)

Misdistribution of benefits and loss/damage

B The new costs incurred by the depreciation of the investment for the sewerage treatment facilities and the facility operation and maintenance costs will be borne by the users. Willingness and ability to pay must be considered in order to avoid inequalities as tariffs are determined in the future.

Local conflicts of interest

B All the municipalities in the City of Skopje should be in agreement with the purpose of the project to avoid conflicts of interest, especially for those municipalities where the sewage system pipe network must be elongated to connect with the treatment plant. The role of the Ministry of Local Self-Governance is of high importance in this coordination work.

Gender, children’s rights

C No significant effect in those aspects has been detected as relates to the construction and operation of the sewerage treatment facilities.

Cultural heritage

C There is no major cultural/historical heritage within the project site.

Infectious diseases such as HIV/AIDS, etc.

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10. Mitigation measures for major environmental/social effects

(1) **Involuntary resettlement**: The project can cause involuntary resettlement if elongating sewer pass through private properties. This involuntary resettlement should be avoided or minimized by planning sewer installation for public areas. Considerable involuntary resettlement may occur if a new landfill is constructed for sludge disposal. This situation can be avoided if sludge disposal is permitted at the extant Drisla waste disposal site; negative impact can also be minimized by planning the construction in a public/private-owned area with low population density.

(2) **Offensive odors**: The operation of the treatment plant and the transportation of sludge to its final disposal site can affect the vicinity with offensive odors. The use of a digesting treatment before disposal can considerably lessen these odors.

(3) **Misdistribution of benefits and loss/damage**: The new costs incurred by the depreciation of the investment for the sewerage treatment facilities and the facility operation and maintenance costs will be borne by the users. Willingness and ability to pay must be considered in order to avoid inequalities as tariffs are determined in the future.
(4)  **Water pollution**: The industrial wastewater pollutant load in the river will remain as is, but water flow may decrease in portions of the Vardar River, where sewage is discharged from the current sewage disposal point to the disposal point for processed water from the treatment plant, leading to higher concentrations of pollutants and degraded water quality in those segments. Mitigating this issue involves introducing anti-pollution measures at the relevant industries, which is outside the scope of this project.

11. **Other Relevant Information**

For baseline information related to the natural environment in the project area, one should refer to the information and data compiled in the General Urban Development Plan of the City of Skopje and to the report of the natural environment status compiled by the Sector for Environmental and Nature Protection of the City of Skopje. Unfortunately, this information is available only in the Macedonian language. It is recommended to gain an understanding of their contents during the early stages of the development study.

Geological maps are not available for foreigners due to the Macedonian internal regulations. Based on visual information facilitated by local geologists, it is understood that the area of Trubarevo is over an alluvial sediment formation. Topographical and geophysical surveys should be performed to understand soil and groundwater features.

The landownership of the area targeted for treatment plant installation is uncertain. The Sector for Urban Planning and Capital Investment of the City of Skopje is in charge of land management; a GIS system, including actualization of information related to ownership status, is currently being implemented.

One must come to understand the hydrological and water quality aspects of the Vardar River, especially in the areas surrounding the lands earmarked for the treatment plant, according to information and/or measurements provided by the Hydro Meteorological Institute, part of the Ministry of Agriculture, Forestry and Water Economy.

Public Enterprise: Water Supply and Sewerage Skopje is monitoring the water quality of the sewage, rivers, and groundwater; nevertheless, the institution lacks the capability to measure and monitor water flow volumes. The lack of information on
sewage flow volume is one of the drawbacks of this project. The indirect estimation of the sewage volume amount and its range of fluctuation should be introduced; otherwise, measurement techniques can be a part of the capacity development of Public Enterprise: Water Supply and Sewerage Skopje with the goal of obtaining more realistic data.