FLOODS EMERGENCY AND RECOVERY PROJECT (FERP)

ENVIRONMENTAL MANAGEMENT PLAN (EMP)

for

Flood Protection of Negotin area: Including reconstruction of protective system in Radujevac - embankment construction works (2,7km)
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Abbreviations

EIA  Environmental Impact Assessment
EMP  Environmental Management Plan
ESMF  Environmental Management Framework Document
ESSS  Environmental and Social Safeguard Specialist
FERP  Floods Emergency Recovery Project
IFI  International Financing Institutions
MAEP  Ministry of Agriculture and Environmental Protection
OP  Operational Policy
PIU  Project Implementation Unit
PSC  Project Supervision Consultant
PWMC  Public Water Management Company
SSIP  Site Specific Implementation Plan
WB  The World Bank Group
WMP  Waste Management Plan
INTRODUCTION

In May 2014 the Republic of Serbia are afflicted with massive flooding caused by heavy rains which caused the formation of torrential streams, rivers overflowing across the dam and breach embankments at several places resulting in flooding of much of the territory of Serbia. The flood affected dozens of settlements and thousands of hectares of arable land.

This document presents the Environmental Management Plan (EMP), which has been prepared to ensure that the proposed Floods Emergency Recovery Project is implemented in accordance with the World Bank operational guidelines and local legislation related to environmental protection. The main purpose of this EMP is to serve as a valuable tool for identifying possible key environmental and social impacts that will result from the project and proposing mitigation measures to address the most significant impacts. The EMP also provides the responsibilities of different parties involved in the project implementation. Although major environmental issues are not anticipated (the project has been categorized as environmental Category B in according to the World bank OP/BP 4.01 on Environmental Assessment) since the investments are directed on the rehabilitation of existing embankment infrastructure, the EMP identifies several mitigation measures aimed at environment protection and maintenance of environmental conditions mainly during the civil works.
1. FLOODS EMERGENCY RECOVERY PROJECT - DESCRIPTION

1.1. Background

Unprecedented rainfall started in early/mid-May 2014 causing massive floods, resulting in the declaration of a national state of emergency in Serbia on May 15, 2014. The heavy rainfall, led to a rapid and substantial increase of water levels in eight of the main rivers in western, southwestern, central and eastern Serbia. Flash floods destroyed houses, bridges and sections of roads, while rising water levels resulted in flooding in both urban and rural areas. The disaster resulted in 51 deaths, with approximately 32,000 people evacuated from their homes, and around 110,000 households cut off from electricity supply. Overall, the floods affected some 1.6 million people, or about one fifth of the total population living in 49 municipalities. Adverse weather conditions have continued since, causing further damage to harvest and energy infrastructure.

The Floods Emergency Recovery Project focuses on the priority sectors identified in the Recovery Needs Assessment including energy, agriculture, and flood protection. The project would help close the financing gap and ensure continued provision of electricity services, forestall a likely decline in direct support to farmers in affected areas at a time when the fiscal accounts are under severe stress and help improve resilience to disasters by financing investments in critical flood prevention infrastructure.

1.2. Radujevac Project Description

Flood Protection of Negotin area includes reconstruction of flood protective system in Radujevac. Embankment construction works in total length of 2,7km are subject of this sub-project.

Danube River caused severe floods in this area, especially affecting Radujevac municipality.

Picture 1: Danube River area
Four different types of works are proposed: Construction of Flood Protection structure – embankment in length of 2.7 km, reconstruction of the weak points on the embankment, upgrading sections of embankment from the 1:25 year flood to the 1:100 year flood, and bank armouring in locations where erosion of the riverbank may undercut the embankment.

Detailed Design is completed. Final environmental approval will be obtained. Construction permit is obtained. Estimated works duration is 14 months. There is no need for any land acquisition, neither the OP4.12 (Involuntary Resettlement) is triggered on this Project.

There is sufficient working space for execution of project works. There are no protected natural or cultural sites within the wide project area. Flooded area which is subject of this project is shown on following picture:
2. LEGAL AND INSTITUTIONAL FRAMEWORK

2.1. Relevant Institutions

The Ministry of Agriculture and Environmental Protection (MAEP), is the key relevant institution for environmental management for FERP related projects.

The other aspects of environmental management related to FERP projects are dealt with several other institutions, among which are the Institute for Nature Protection of Serbia and the Institute for Protection of Cultural Monuments of the Republic of Serbia, and the Public Water Management Companies (PWMC) “Serbia Vode”, “Beograd Vode” & “Vode Vojvodina”.

Directorate of Agrarian Payments (DAP) implements the Farm Incentives Program. Farmers applying for the program have to be registered in the Farm Registry to be eligible for support.

2.2. EIA procedure in the Republic of Serbia

In the juridical system of the Republic of Serbia, the Environmental Impact Assessment procedure is regulated by the Law on Environmental Impact Assessment, which is completely in line with European EIA Directive (85/337/EEC, 97/11/EC, 2003/35/EC and COM 2009/378). According to that Law, preparation of the Environmental Impact Assessment is not required for the flood protection rehabilitation projects unless their alignments are placed within or in the vicinity of the nature or culture protected areas. In such cases the Project Proponent is obliged to submit so-called “Request for Decision about Need for Environmental Impact Assessment” (RDNEIA) to the MAEP. Depending on the Ministry’s assessment of significance of potential environmental impacts of the project, it is decided if there is a need (or not) to apply partial or full EIA procedure for the relevant sub-project.

Request for opinion regarding necessity of EIA procedure for each sub-project which is found to be adjacent or within the nature/cultural protected area will be submitted to DoEIA.


Environmental protection in Republic of Serbia is regulated by several national and municipal laws and by-laws. The environmental legislation in force in Serbia is summarized in Annex 1.

The main legal documents are:

- The Constitution of Serbia (“Official Gazette of RS” No. 98/06).
- The National Strategy for Sustainable Development (“Official Gazette of RS” No. 72/09, 81/09)
- Law on Environmental Protection (“Official Gazette of RS” No. 135/04, 36/09)
- Law on Environmental Impact Assessment (“Official Gazette of RS” No. 135/04)
- Law on Waste Management (“Official Gazette of RS” No. 36/09)
- The Law on Water (“Official Gazette of RS” No. 30/10, 93/12)
- The Law on Occupational Safety and Health (“Official Gazette of RS” No. 101/05)
- Law on Planning and Construction (“Official Gazette of RS” No. 72/09, 81/09)
- Agricultural Land Law, (“Official Gazette of RS” No. 62/06, 41/09)

Regulations established on the basis of the Law on EIA include the following:

- Decree on establishing the List of Projects for which the Impact Assessment is mandatory and the List of projects for which the EIA can be requested (“Official Gazette of RS” No. 114/08)
- Rulebook on the contents of requests for the necessity of Impact Assessment and on the contents of requests for specification of scope and contents of the EIA Study (“Official Gazette of RS” No. 69/05)

2.4. Applicable Safeguards

Safeguard Policies triggered by the Radujevac Project:

<table>
<thead>
<tr>
<th>Safeguard Policies Triggered by the Project</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Assessment OP/BP 4.01</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Natural Habitats OP/BP 4.04</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Forests OP/BP 4.36</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Pest Management OP 4.09</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Physical Cultural Resources OP/BP 4.11</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Indigenous Peoples OP/BP 4.10</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Involuntary Resettlement OP/BP 4.12</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Safety of Dams OP/BP 4.37</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Projects on International Waterways OP/BP 7.50</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Projects in Disputed Areas OP/BP 7.60</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

3. POTENTIAL ENVIRONMENTAL IMPACTS

Since the existing infrastructure, facilities and equipment will be rehabilitated, reconstructed, repaired and replaced during the realisation of the project, impacts on environment will be a consequence of human presence and construction machines, and the nature of construction works at a location, which are limited to the location of works or its surrounding vicinity.

The construction and reconstruction of flood protection structures would not pose significant risks to the environment. In addition, the project aims is only to improve the efficiency of flood control systems. As a consequence, the range of impacts is limited (impacts directly related to the rehabilitation activities) and their magnitude remains small (localized impacts and no significant effect on future operation). Considering the nature of the proposed project, it is anticipated that adverse environmental impacts can be expected in the construction phase mainly. The aspect of health and safety at work is also taken into consideration. It is to be noted that parts of the construction work are taking place in an urban environment, however in all parts in an environment already strongly influenced by human activities. Broadly, the impacts in the construction phase can be of the following types:

- **Soil and Water Pollution**: during construction activities, when using machinery, there is a possibility of soil contamination due to accidental spills of oils and fuel from construction machinery. In the area of construction works, construction waste is generated which, if not properly disposed of, may result in adverse impacts. The construction works carried out inside the river bed results in a temporary blur of the watercourse.

- **Flora and fauna**: construction works in the river bed along with the temporary blurring of the watercourse threaten freshwater habitats. Impacts on other habitats are not expected.
- **Disposal of excavated materials and construction wastes.** Demolition debris and excessive soil are usually generated during the rehabilitation works on drainage and flood control systems;

- **Degradation of landscapes and soil erosion.** The impacts on vegetative cover will be short-term, localized, and totally associated with rehabilitation works;

- **Impacts from temporary access roads and work areas.** Establishment of temporary dirt roads to access work areas and temporary dumping sites for excavated materials can enhance soil erosion, and degrade the landscape;

- **Noise and vibration disturbances** during construction and temporary air pollution (dust) related to the transportation of construction materials and truck traffic. These impacts will occur during the construction and rehabilitation works, but will be only short-term. Effects include dust from construction activities, noise during trench excavation, possible effect of vibration caused by operation of heavy machinery, increased traffic in some sections of roads, etc.;

- **Safety hazards from construction activities.** No major hazards are expected the construction of the proposed project elements, as long as proper construction practices and safety procedures are applied;

- **Impacts on historic-cultural and archaeological monuments.** No archaeological or cultural resources are expected to be encountered during project implementation since major works consist in rehabilitation of existing systems where excavations have been conducted before and no findings have been reported.

### 3.1. Potential impacts of Radujevac Project

In general, all negative impacts in the phase of construction are temporary and can be mitigated by applying good construction practices.

Significant negative impacts on natural environment in the operational phase are not expected. On the contrary, impacts in the operational phase are considered to be highly positive, as project aims at prevention of risks for environment, humans and property.

Construction of flood protection structures is based on the river bank regulation; it is about preventing the flooding of relatively small areas of urban zones, and at relatively shallow depths. Thus, the volume of the retained water that could possibly influence the natural wave retardation in the river is negligible, compared to the volume of water wave, therefore the downstream impact on other users is negligible.

Project impacts by phases are shown in following table:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Type of impact</th>
</tr>
</thead>
</table>
| Construction phase| Soil compaction and erosion  
Dust emission  
Noise  
Soil and water pollution  
Impact on aquatic ecosystem  
Degradation of riparian vegetation caused by construction work  
Risk to people and/or animals of unfenced and unlabelled construction site  
Health and safety risk for workers on the construction site due to the potential land sliding |
| Operational phase | Low impact on natural environment on the project location  
Positive impact in terms of prevention of risks for environment, humans and property |
| Degree of negative impact | Minimum if mitigation measures are applied |
3.2. Other positive impacts of FERP Project

The repair of flood-damaged infrastructure and facilities will bring economic, social, health and ecological benefits, to population and local community in this area. Experiences of similar projects show that the project will have many positive effects on society through the creation of conditions for population's standard growth in almost all segments (education, health protection, additional employment).

In case of unemployment and poverty in the project area, manpower resources will not be reduced. If some of the unemployed are employed or if employment has impact on unemployment, the project creates social benefits due to decreased social support or aid to the unemployed. That is the case in the flood emergency response project.

3.3. Potential negative Impacts and recommended Mitigation Measures

Summary of key impacts during construction phase and recommended mitigation measures are described in following table:

<table>
<thead>
<tr>
<th>impact</th>
<th>Significance</th>
<th>comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>impacts on land use/ settlements,</td>
<td>low</td>
<td>There will be no land acquisition as defined by WB OP 4.01 during the project implementation. In case of any land acquisition – RFP document is prepared for this Project</td>
</tr>
<tr>
<td>ground and surface water,</td>
<td>low</td>
<td>Due to low amount of drainage water that can be potentially drained into any river the consequential impact is expected to be minimal to negligible</td>
</tr>
<tr>
<td>air quality,</td>
<td>low</td>
<td>Temporary impact. Local air quality may experience some moderate and temporary deterioration due to dust from construction traffic and elevated levels of nitrogen oxide (NOx) and sulphur oxide (SOx) from construction equipment exhausts. Impact can be mitigated by following GEMM procedures</td>
</tr>
<tr>
<td>flora and fauna (protected areas and species),</td>
<td>low</td>
<td>Minimal loss or damage of vegetation and loss and damage or disruption to fauna can occur during works. Impacts can be offset or mitigated by following GEMM procedures. There will be no negative impacts on protected areas due to nature of works.</td>
</tr>
<tr>
<td>noise and vibration,</td>
<td>low</td>
<td>Only limited temporary impact during the rehabilitation phase. Mitigation measures in form of noise deflecting shields will be placed where the work-scheduling activities cannot have desired effect. Impact can be mitigated by following GEMM procedures.</td>
</tr>
<tr>
<td>soil quality,</td>
<td>low</td>
<td>Soil contamination can occur from: drainage of dredged materials, spillage of hazardous and toxic chemicals. Impact can be mitigated by following GEMM procedures</td>
</tr>
<tr>
<td>waste,</td>
<td>low</td>
<td>Health hazards and environmental impacts can happen due to improper waste management practices. Impact can be mitigated by following GEMM procedures</td>
</tr>
</tbody>
</table>
### Impact, Significance, Comment

<table>
<thead>
<tr>
<th>Impact</th>
<th>Significance</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>cultural and religious issues,</td>
<td>low</td>
<td>Regular rehabilitation activities could, if not properly managed, cause disturbance to the cultural and religious sites. Impact can be avoided by implementing EMP related measures.</td>
</tr>
<tr>
<td>cumulative impacts etc.</td>
<td>Mediu m/ moder ate</td>
<td>Temporary, rehabilitation works may cause a slight increase of noise levels and air pollutants concentrations during the works only.</td>
</tr>
</tbody>
</table>

- Pollution of water and soil because of improper disposal of excavated materials and construction wastes
- Loss of top soil due to temporary access roads and work areas, Landscape degradation
- Temporary air pollution (dust) related to the transportation of construction materials and truck traffic.
- Noise and vibration disturbances
- Staff safety

### 4. MITIGATION MEASURES AND ENVIRONMENTAL MONITORING ACTIVITIES

For each FERP sub-project ESSS is obliged to produce a site-specific EMP document. EMP is an Action Plan that indicates which of the Environmental Assessment report recommendations and alternatives will actually be adopted and implemented. EMP could be produced as a part of Detailed Design or as a free-standing document. It will ensure incorporation of the relevant environmental factors into the overall project design and will identify linkages to other safeguard policies relating to the project.

#### 4.1. Mitigation Measures

4.1.1. General

The environmental impacts identified at this stage are preliminary in nature and will need to be further elaborated specifically (subproject wise) and potential for occurrence has to be ascertained during further stages of subproject design and implementation.

This section details out the potential environmental impacts of the sub-projects funded by WB under FERP.

4.1.2. Environmental Impacts and adequate Mitigation Measures

**Erosion of embankment slopes**

**Impact** - The earthworks for the sub-project activities might cause negative impacts in form of erosion on embankment slopes, dust, noise and vibration to disturb the local people.

**Mitigation Measures** - Excavation and/or filling will be done in such a way that the slope of the embankment should be within right of way and will not disrupt drainage problems. The Contractor should use erosion control measures such as re-vegetation of disturbed areas and placing of tarps. The Contractor shall stabilize the cleared areas not used for rehabilitation...
activities with vegetation or with the appropriate surface treatments as soon as practicable following completion of activities.

Potential air pollution - Dust

**Impact** - Possible sources of air pollution will be dust due to maintenance activities, machinery movement and other sources. Rehabilitation works involve breaking up, digging, crushing, transporting, and dumping small quantities of dry materials. Locally, the air quality may experience some moderate and temporary deterioration due to dust from construction traffic and elevated levels of nitrogen oxide (NOx) and sulphur oxide (SOx) from construction equipment exhausts. The dust may settle on vegetation, crops, structures and buildings.

**Mitigation Measures** - Spraying of water is the main way of controlling dust. Water is, in any case, required to be added to fill material during the rehabilitation works.

Potential water contamination

**Impact** - Water contamination may occur during the execution of the project from site run off, spills from the equipment maintenance areas and sanitary wastewater effluent from the work camps. As for the potential pollution during operation, these are mostly limited to accidents. In such a case, procedures for action in incidental situations, as defined by the Ministry of Interior and in the Water Law, will apply.

**Mitigation Measures** - Fuel and lubricant spills can occur at the Contractor’s work camp while maintaining and washing equipment and work vehicles. During the normal operations, these areas should be equipped with the adequately sized, gravity oil separator. Should spills occur, to mitigate the problem the Contractor should use absorbing materials, such as absorbent mats/fabrics, or sand and scrape off the contaminated soils and dispose them in approved facility, in accordance with the Water Law.

Potential contamination of soils due to pesticide usage and improper waste disposal

**Impact** - Potential contamination of soils due to increased use of pesticides during implementation of Farm Incentives Program (FERP – Component 2).

**Mitigation Measures** - Integrated Pest Management Approach (IPM) is mandatory during project execution. Ensuring of appropriate selection and safe use of pesticides when they are needed by project demands related to safeguard OP 4.09 - Pest Management. Avoiding of use of pesticides that fall in WHO classes IA, IB or II.

**Impact** - Potential contamination of soils and watercourses as a result of improper disposal of liquid and solid wastes from rehabilitation activities.

**Mitigation Measures** - The mitigation measure to avoid contamination of soils and watercourses is to ensure that waste materials are properly disposed to the suitable locations. Partly, inert waste materials can be used as filling material.

Contractor should produce a Waste Management Plan for the Project. Mitigation measures should, among other requirement, contain contractor obligations to:

- locate the garbage pit/waste disposal site min 500 m away from the residence so that peoples are not disturbed with the odour likely to be produced from anaerobic decomposition of wastes at the waste dumping places. Encompass the waste dumping place by fencing and tree plantation to prevent children to enter and play with. All solid waste will be collected and removed from the work camps and disposed in approval waste disposal sites.
- In case oil and grease are trapped for reuse in a minimum 60cm thick lined pit, care shall be taken to ensure that the pit should be located at the lowest end of the site and away from the residential areas.
- In case of filling of low-lying areas with wastes, it needs to be ensured that the level matches with the surrounding areas. In this case care should be taken that these low lying areas are not used for rainwater storage.

**Equipment maintenance and fuelling**

**Impact** - Equipment maintenance and fuelling may cause contamination of soils and watercourses, including groundwater, if handling of lubricants, fuels and solvents is improper or careless.

**Mitigation Measures** - To avoid damage to natural environment there is a need to ensure proper handling of lubricants, fuels and solvents while maintaining the equipment.

**Occupational Health and Safety**

**Impacts** - Construction workers may be affected adversely due to hazardous working environments where high noise, dust, unsafe movement of machinery etc. may be present.

**Mitigation Measures** - The Contractor shall instruct his workers in health and safety matters, and require from the workers to use the provided personal safety equipment. Contractor has to ensure that all operators of heavy or dangerous machinery are properly trained/certified, and also insured. He will have to provide first aid facilities, rapid availability of trained paramedical personnel, and emergency transport to nearest hospital with accident and emergency facilities.

**Noise**

**Impact** - Noise caused by the rehabilitation works will have only a temporary impact. Although temporary and mostly moderate, noise impacts in the vicinity of residential areas may cause negative health impact, if not mitigated.

**Mitigation Measures** - In sensitive areas (schools, nature parks, hospitals) special care regarding noise emission will be taken by the Contractor, strictly respecting the EMP requirements. In case of noise disturbance with noise emissions which are above permitted level, temporary noise barriers should be considered as appropriate mitigation measure. Awareness building and administrative measures should be taken to ensure proper maintenance of vehicles. In case of exceeded noise limits for sensitive areas the Contractor should erect temporary shields to prevent a free noise spreading to the sensitive receptors.

Based on the preliminary assessment, key mitigation measures recommended under this Environmental Management Plan (EMP) are listed as follows:

- Identify and locate on project plans any sensitive natural resources in the project area including but not limited to patches of natural habitat, bird colonies, and wetlands, unique plant communities etc. (consult with local nature protection authorities).
- Identify local access routes through and around cultivated land and pasture.
- Minimize requirements for temporary or permanent alteration of lands outside the embankment right of way.
- Dredging for embankment materials should occur only within marked navigation channels to minimize destruction of fish habitat.
- Provide for zones of preliminary accumulation of wastes that will cause no damage to the vegetation cover and other components of the environment.
- Transport and disposal of construction concrete rubbles, debris and spoils in approved paths and landfills/dump sites.
- Delineate access roads/ work areas carefully and prevent their expansion.
- Rehabilitate access roads and work areas after work completion (scratch soil with special engine, put fertile topsoil in place, etc.).
- Use closed/covered trucks for transportation of construction materials.
- Clean the surrounding area from dust by water sprinkling, removal of excess materials and cleaning of sites upon completion of activities.
- Restoration to quasi-original conditions of landscape after completion of construction and rehabilitation works.
- Arrange necessary preservation measures (establish protection zones, by-pass these areas during transportation and other).
- Cease the works as soon as historical and cultural monuments are encountered during earthworks and provide relevant information to the State Agency for Historical and Cultural Monuments Protection.
- Conduct mid-term and end-of-project inspections to the sites during construction and rehabilitation works.

Prior to initiating works, the Contractors will be required to prepare and submit for approval Site-Specific Implementation Plans (SSIP) consisting of:

- Waste and wastewater management plan
- Oil and fuel storage management plan
- In-river works management plan
- Camp management plan
- Re-forestation plan
- Emergency response plan

The following table presents Mitigation Plan for FERP Sub-project Radujevac and it is intended as a checklist to ensure that relevant mitigation measures are implemented at appropriate project stages.
### 4.2. Mitigation Plan for FERP Sub-Project RADUJEVAC

<table>
<thead>
<tr>
<th>Phase</th>
<th>Problem/activity impact</th>
<th>Mitigation measures</th>
<th>Costs</th>
<th>Institutional responsibility</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning/Designing</td>
<td>Assure compliance with relevant construction field legislation</td>
<td>Acquire construction permit, provide Water management guidelines if subprojects are executed near surface watercourses.</td>
<td>n/a</td>
<td>Project applicant</td>
<td>Project applicant</td>
</tr>
<tr>
<td>Planning/Designing</td>
<td>Potential damages to the existing infrastructure and facilities, especially underground installations (water supply and sewage pipeline etc.) which cause obstacles in the provision of services to consumers.</td>
<td>Precisely situate the position of infrastructural facilities and underground installations at the location of works in cooperation with relevant institutions at all levels of authority.</td>
<td>n/a</td>
<td>Designer</td>
<td>Project applicant in cooperation with designers and representatives of relevant institutions of local authority.</td>
</tr>
<tr>
<td>Planning/Designing</td>
<td>Increased possibility of employment and gaining income in the local community.</td>
<td>Prioritise qualified local population in employment.</td>
<td>n/a</td>
<td>Project applicant</td>
<td>Contractor</td>
</tr>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Supply of material</td>
<td>Use the existing quarries, asphalt and concrete bases for the supply of material. Use licensed suppliers for other materials.</td>
<td>n/a</td>
<td>Contractor</td>
<td>Contractor</td>
</tr>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Transport of material.</td>
<td>Using trucks with awning and special vehicles depending on the type of material.</td>
<td>n/a</td>
<td>Contractor</td>
<td>When transporting material, drivers must observe speed limitations.</td>
</tr>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Violation of vegetation cover.</td>
<td>Replant or re-seed vegetation. Apply measures of good construction practice.</td>
<td>n/a</td>
<td>Contractor</td>
<td>Problems should be regulated through the Works execution contract.</td>
</tr>
<tr>
<td>Phase</td>
<td>Problem/activity impact</td>
<td>Mitigation measures</td>
<td>Costs</td>
<td>Institutional responsibility</td>
<td>Comment</td>
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<td>-----------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Emissions of dust from the landfill of earth material, due to vehicles' movement on macadam roads and construction works execution.</td>
<td>Compact deposited earth material. Sprinkle dust sources with water in order to reduce impacts on the surrounding population and vegetation. Control the speed of vehicles in order to reduce dust rising. Prepare and implement a Plan for construction site organisation that includes good construction practices.</td>
<td>n/a</td>
<td>n/a</td>
<td>Contractor Contractor Problems should be regulated through the Works execution contract.</td>
</tr>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Emission of gases and particles from vehicles, mechanisation and generators.</td>
<td>Regular equipment maintenance. The contractor is obliged to submit evidence of vehicle roadworthiness in line with the regulations on hazardous gases emission. Prepare and implement the Construction Site Organisation Plan that incorporates good construction practice measures.</td>
<td>n/a</td>
<td>n/a</td>
<td>Contractor Contractor Problems should be regulated through the Works execution contract.</td>
</tr>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Noise in the operation of heavy mechanisation and generators.</td>
<td>Observe law-defined working hours at the construction site. Make the generator casings sound proof if they are located near residential units. Ensure mufflers for heavy machinery. Prepare and implement the Construction Site Organisation Plan that incorporates good construction practice measures.</td>
<td>n/a</td>
<td>n/a</td>
<td>Contractor Contractor Problems should be regulated through the Works execution contract.</td>
</tr>
<tr>
<td>Phase</td>
<td>Problem/activity impact</td>
<td>Mitigation measures</td>
<td>Costs</td>
<td>Institutional responsibility</td>
<td>Comment</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Increased water turbidity as a consequence of the works.</td>
<td>Construction works should be executed in a way that surfaces and natural contents outside the project are not damaged and that works are performed so that watercourses are not unnecessarily made turbid and watercourses discontinued. Works should be executed in dry weather. Prepare and implement a Construction Site Organisation.</td>
<td>n/a</td>
<td>Contractor</td>
<td>Contractor. Problems should be regulated through the Works execution contract.</td>
</tr>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Soil, groundwater and surface water pollution, with oils and lubricants due to equipment poor maintenance and repairs and refuelling at the construction site.</td>
<td>Avoid servicing and refuelling at the site. Use protective foils during possible vehicle refuelling and maintenance at the construction site. Provide absorbing material in case of fuel spills. Used oil materials and agents should be managed in line with the Waste management report. Procedure for actions in case of incidental oil and lubrication spills. Prepare and implement the Construction Site Organisation Plan that incorporates good construction practice measures, measures from water management documents and measures from the Waste management report.</td>
<td>n/a</td>
<td>Contractor</td>
<td>Contractor. Problems should be regulated through the Works execution contract.</td>
</tr>
<tr>
<td>Phase</td>
<td>Problem/activity impact</td>
<td>Mitigation measures</td>
<td>Costs</td>
<td>Institutional responsibility</td>
<td>Comment</td>
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</tr>
<tr>
<td>Rehabilitation/</td>
<td>Water and soil pollution due to inadequate disposal of communal, inert</td>
<td><strong>Typical containers for solid communal waste are placed at the construction site locations; Acceptance of collected communal waste and its disposal by authorised institutions; Hazardous waste fractions (used waste oils, oiled packaging, bitumen agents waste, waste transformer oils, waste asbestos-cement pipes etc.) are separately collected into typical containers or metal barrels; they are to be consigned to entities authorised for hazardous waste management; Re-useage and recycle of waste whenever possible. It is prohibited to incinerate waste in the open and at the location. Actions in line with the waste management report.</strong></td>
<td>n/a</td>
<td>Contractor</td>
<td>Problems should be regulated through the Works execution contract.</td>
</tr>
<tr>
<td>Reconstruction/ Repair</td>
<td>and hazardous waste.</td>
<td></td>
<td>n/a</td>
<td>Contractor</td>
<td></td>
</tr>
<tr>
<td>Rehabilitation/</td>
<td>Reconstruction of damaged bridges</td>
<td><strong>Avoid driving on the riverbank or river; Ensure riverbed and bank in the zone of bridges, upstream and downstream from bridges, as to ensure their protection from erosion processes.</strong></td>
<td>n/a</td>
<td>Contractor</td>
<td>Problems should be regulated through the Works execution contract.</td>
</tr>
<tr>
<td>Reconstruction/ Repair</td>
<td></td>
<td></td>
<td></td>
<td>Contractor</td>
<td></td>
</tr>
<tr>
<td>Phase</td>
<td>Problem/activity impact</td>
<td>Mitigation measures</td>
<td>Costs</td>
<td>Institutional responsibility</td>
<td>Comment</td>
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</tr>
<tr>
<td>Rehabilitation/</td>
<td>Reduced passability through the area where the works are executed.</td>
<td>Plan the relocation of equipment at times when daily traffic is not jammed; Provide alternative passage for pedestrians and vehicles in cooperation with local authorities or provide a safe passage through the construction site; Avoid roads through inhabited areas especially near schools and hospitals; Prepare and implement the Construction Site Organisation Plan that incorporates good construction practice measures.</td>
<td>Planning n/a</td>
<td>Contractor</td>
<td>Problems should be regulated through the Works execution contract.</td>
</tr>
<tr>
<td>Reconstruction/Repair</td>
<td></td>
<td></td>
<td>n/a</td>
<td>Contractor</td>
<td></td>
</tr>
<tr>
<td>Rehabilitation/</td>
<td>Potential pollution of soil and water due to the discharge of waste sanitary waters from the construction site</td>
<td>Installation of ecological toilets for workers</td>
<td>Planning n/a</td>
<td>Contractor</td>
<td>Problems should be regulated through the Works execution contract.</td>
</tr>
<tr>
<td>Repair</td>
<td></td>
<td></td>
<td>n/a</td>
<td>Contractor</td>
<td></td>
</tr>
<tr>
<td>Rehabilitation/</td>
<td>Population at increased risks of traffic accidents and construction works to population.</td>
<td>Assure adequate warning signs, lighting, protective fencing etc. Observe traffic rules. Clean construction waste form the construction site both in the construction phase and after works completion, when closing the construction site. Assure medical supplies and aid through institutional and administrative arrangements with municipal hospitals at the construction site. Implement the Construction Site Organisation Plan.</td>
<td>Planning n/a</td>
<td>Contractor</td>
<td>Problems should be regulated through the Works execution contract.</td>
</tr>
<tr>
<td>Repair</td>
<td></td>
<td></td>
<td>n/a</td>
<td>Contractor</td>
<td></td>
</tr>
<tr>
<td>Phase</td>
<td>Problem/activity impact</td>
<td>Mitigation measures</td>
<td>Costs</td>
<td>Institutional responsibility</td>
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</tr>
<tr>
<td>Rehabilitation/ Reconstruction/ Repair</td>
<td>Risk of injuries at work.</td>
<td>Demand from all workers to abide by the Protection at work measures; Provide protective equipment; Install warning signs at the construction site; Prepare and implement the Construction Site Organisation Plan and Protection at work measures plan.</td>
<td>n/a</td>
<td>Contractor</td>
<td>Problems should be regulated through the Works execution contract.</td>
</tr>
<tr>
<td>Construction site closure</td>
<td>Construction material leftovers of after the closure of temporary construction sites</td>
<td>All shivers and material that remain after the closure of temporary construction sites are to be removed from the location and re-used/recycled where possible. All remains are to be disposed of in a manner that will not be harmful to environment; this is to be done by companies that have permits to perform such works.</td>
<td>n/a</td>
<td>Contractor</td>
<td>Problems should be regulated through the Works execution contract.</td>
</tr>
</tbody>
</table>
## Summary of Potential Environmental Impacts and Mitigation Measures

<table>
<thead>
<tr>
<th>POTENTIAL IMPACTS</th>
<th>STAGE / MECHANISM</th>
<th>MAGNITUDE</th>
<th>DURATION</th>
<th>SUGGESTED MITIGATION MEASURE</th>
<th>RESIDUAL EFFECT</th>
<th>RESPONSIBILITY</th>
<th>TIMING</th>
<th>COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROLOGY &amp; HYDROGEOLOGY</td>
<td>Construction Activities</td>
<td>Negligible</td>
<td>Construction Period</td>
<td>No mitigation measures required.</td>
<td>None</td>
<td>Not applicable.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Operation and Maintenance</td>
<td>Negligible</td>
<td>Lifespan of embankment</td>
<td>No mitigation measures required.</td>
<td>None</td>
<td>Not applicable.</td>
<td>-</td>
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</tr>
<tr>
<td>SOILS Erosion or compaction of soils</td>
<td>Construction Activities</td>
<td>Minor</td>
<td>Construction Period</td>
<td>• Salvage of topsoil and sod for reclamation following completion of the works.</td>
<td>None</td>
<td>Contractor &amp; Local Water Authority</td>
<td>During and at completion of construction. Periodic monitoring until reclamation criteria achieved.</td>
<td>Included in the bill of quantity</td>
</tr>
<tr>
<td></td>
<td>Operation and Maintenance</td>
<td>Negligible</td>
<td>Lifespan of embankment</td>
<td>No mitigation measures required.</td>
<td>None</td>
<td>Local Water Authority</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>AQUATIC RESOURCES Disturbance of wetlands or fish habitat</td>
<td>Construction Activities</td>
<td>Minor</td>
<td>Construction Period</td>
<td>• Follow approved dredging practices. • Minimize disturbance to riparian wetlands.</td>
<td>None</td>
<td>(Ministry or Directorate responsible for fish management) Institute for Nature Conservation (in protected areas)</td>
<td>During dredging.</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Operation and Maintenance</td>
<td>Negligible</td>
<td>Lifespan of embankment</td>
<td>No mitigation measures required.</td>
<td>None</td>
<td>Not applicable.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>POTENTIAL IMPACTS</td>
<td>STAGE / MECHANISM</td>
<td>MAGNITUDE</td>
<td>DURATION</td>
<td>SUGGESTED MITIGATION MEASURE</td>
<td>RESIDUAL EFFECT</td>
<td>RESPONSIBILITY</td>
<td>TIMING</td>
<td>COSTS</td>
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</tr>
<tr>
<td>VEGETATION Disturbance to vegetation communities, tree removal</td>
<td>Construction Activities</td>
<td>Minor</td>
<td>Construction Period</td>
<td>• Locate borrow pits and sand drainage areas to minimize new areas of disturbance. • Utilize existing disturbed areas whenever possible.</td>
<td>Removal of some trees and vegetation</td>
<td>Tendering agency/local water authority</td>
<td>Detailed design (tender specification).</td>
<td>Included in the bill of quantity</td>
</tr>
<tr>
<td>Operation and Maintenance</td>
<td>Negligible</td>
<td>Lifespan of embankment</td>
<td>No mitigation measure required.</td>
<td>None</td>
<td>Not applicable.</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>WILDLIFE Disturbance and dislocation from habitat</td>
<td>Construction Activities</td>
<td>Minor</td>
<td>Construction Period</td>
<td>• Schedule construction to minimize disturbance to nesting birds.</td>
<td>None</td>
<td>Tendering agency.</td>
<td>Detailed design (tender specification)</td>
<td></td>
</tr>
<tr>
<td>Operation and Maintenance</td>
<td>Negligible</td>
<td>Lifespan of embankment</td>
<td>No mitigation measures required.</td>
<td>None</td>
<td>Not applicable.</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>POLLUTION Fuel spills or improper waste disposal</td>
<td>Construction Activities</td>
<td>Minor</td>
<td>Construction Period</td>
<td>• Equipment free from leaks and in good operating condition. • Refuel at least 15 m away from surface water. • Prompt clean-up of fuel spills. • Solid and human waste management plan for the construction site.</td>
<td>None</td>
<td>Tendering agency/local water authority/contractor</td>
<td>Construction start-up and construction period. (condition of tender)</td>
<td>Normal construction cost(Included in the bill of quantity)</td>
</tr>
<tr>
<td>Operation and Maintenance</td>
<td>Negligible</td>
<td>Lifespan of embankment</td>
<td>No mitigation measures required.</td>
<td>None</td>
<td>Not applicable.</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
5. **MONITORING ACTIVITIES**

DWM/PIU and PSC will monitor overall environmental performance during project implementation. Each FERP sub-project will have a site specific EMP document in which a monitoring plan(s) and check-lists are presented.

For each of the environmental components, the monitoring plan specifies the parameters to be monitored; location of the monitoring sites and duration of monitoring. The monitoring plan also specifies the applicable standards, implementation and supervising responsibilities.

In addition to the critical locations selected during design stage, the environmental monitoring will also be done at the construction camp site and any other plant site as determined relevant during rehabilitation works stage.

World Bank guidance on the environmental aspects of project monitoring, including its health and socio-economic aspects, is provided in Environmental Assessment Sourcebook Update 14 Environmental Performance Monitoring and Supervision (June 1996).

The project’s monitoring program included surface and groundwater quality impacts, disturbance to important ecological habitats including riverside ecosystems, unscheduled environmental compliance inspections during construction, final inspection upon completion to ensure site condition is satisfactory, and assessment of sites prior to and after construction to ensure no loss of natural values.

**Elements of an environmental performance-monitoring program:**

**Objectives**

**Indicators linked to project impacts and mitigation measures**

**Measured parameters**

**Institutional responsibilities, timing**

**Reporting arrangements**

**Cost and financing provisions**

The following table presents the monitoring activities and responsibilities over the implementation of proposed mitigation measures, during execution of FERP sub-project Radujevac.
5.1. Monitoring Plan for FERP Sub-Projects RADUJEVAC

<table>
<thead>
<tr>
<th>Phases</th>
<th>Monitoring parameter</th>
<th>Monitoring location</th>
<th>Monitoring manner / monitoring equipment</th>
<th>Monitoring time – measurement frequency or permanently</th>
<th>Why is monitoring necessary</th>
<th>Costs</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply of material</td>
<td>Possession of environmental permits for plants of quarries, asphalt and concrete bases from which material is supplied</td>
<td>Legal entities that own the plants</td>
<td>Insight into the documentation</td>
<td>During material supply</td>
<td>Assure that the plant conforms to the requirements of environment protection, health protection and human safety</td>
<td>Incorporated into the supervision implementation costs</td>
<td>Supervising body</td>
</tr>
<tr>
<td>Transport of material</td>
<td>If trucks are covered during powdered material transport</td>
<td>At the construction site and transport roads</td>
<td>Visual supervision</td>
<td>During material transport</td>
<td>See that no dust is emitted into the air and material spilled into environment</td>
<td>Incorporated into the supervision implementation costs</td>
<td>Supervising body</td>
</tr>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Degradation and soil pollution</td>
<td>At the construction site and directly around the construction site</td>
<td>Visual supervision</td>
<td>Weekly</td>
<td>To establish if liquid oil derivatives leaked, soil erosion and landslide occurred due to construction works</td>
<td>Incorporated into the supervision implementation costs</td>
<td>Supervising body</td>
</tr>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Does the construction site meet the criteria from the guidelines for good construction practice</td>
<td>At the construction site</td>
<td>Visual supervision, insight into the documentation</td>
<td>During the works execution</td>
<td>To assure environment protection and prevent the occurrence of incident situations at the construction site</td>
<td>Incorporated into the supervision implementation costs</td>
<td>Supervising body</td>
</tr>
</tbody>
</table>

ENVIRONMENTAL MANAGEMENT PLAN - EMP, FLOOD PROTECTIVE SYSTEM IN RADUJEVAC
<table>
<thead>
<tr>
<th>Phases</th>
<th>Monitoring parameter</th>
<th>Monitoring location</th>
<th>Monitoring manner / monitoring equipment</th>
<th>Monitoring time – measurement frequency or permanently</th>
<th>Why is monitoring necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Occurrence of noise and air pollution</td>
<td>At the works execution location</td>
<td>Standard air quality and noise level measurement equipment</td>
<td>Upon received citizens' complaints</td>
<td>In order to establish the level of air pollution and noise and make comparison with legal limit values. In case of aberration additional mitigation measures.</td>
</tr>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Destruction of crops, woods, meadows etc.</td>
<td>At the works execution location and in the vicinity</td>
<td>Visually</td>
<td>Upon received citizens' complaints</td>
<td>In order to establish that works are only executed at project-envisioned locations</td>
</tr>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Working hours control.</td>
<td>At the works execution location</td>
<td>Visually and comparison with the construction site organisation plan.</td>
<td>Upon received citizens' complaints</td>
<td>In order to establish that working hours and noise emission limitations are observed during daily working hours.</td>
</tr>
<tr>
<td>Rehabilitation/Reconstruction/Repair</td>
<td>Waste management during the works execution</td>
<td>At the construction site</td>
<td>Visually and by comparison with the waste management report.</td>
<td>Permanently</td>
<td>Are containers/bins for communal waste installed, is hazardous waste treated in adequate manners, in order to prevent uncontrolled waste disposal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Costs</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
<td>Implement.</td>
</tr>
<tr>
<td>Company that has licence to perform environment monitoring works</td>
<td>Supervising body</td>
</tr>
</tbody>
</table>

ENVIRONMENTAL MANAGEMENT PLAN - EMP, FLOOD PROTECTIVE SYSTEM IN RADUJEVAC 25
<table>
<thead>
<tr>
<th>Phases</th>
<th>Monitoring parameter</th>
<th>Monitoring location</th>
<th>Monitoring manner / monitoring equipment</th>
<th>Monitoring time – measurement frequency or permanently</th>
<th>Why is monitoring necessary</th>
<th>Costs</th>
<th>Responsibility</th>
<th>Planning</th>
<th>Implement.</th>
<th>Planning</th>
<th>Implement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehabilitation/</td>
<td>Number of registered accidents and Existence of acceptable</td>
<td>At the construction site</td>
<td>Visually and insight into the register</td>
<td>Permanently during the works execution</td>
<td>In order to establish that protection at work measures are implemented.</td>
<td>Incorporated into the supervision implementation costs</td>
<td>Contractor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reconstruction/</td>
<td>hygienic conditions for workers, Protective equipment</td>
<td></td>
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<td></td>
<td></td>
<td>Supervising body</td>
<td></td>
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</tr>
<tr>
<td>Repair</td>
<td>application</td>
<td></td>
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</tr>
<tr>
<td>Rehabilitation/</td>
<td>Impact on population due to the limitation of business</td>
<td>Local community</td>
<td>Insight into the register</td>
<td>Upon received citizens’ complaints</td>
<td>In order to timely prevent impact</td>
<td>Incorporated into the supervision implementation costs</td>
<td>Project applicant</td>
<td></td>
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</tr>
<tr>
<td>Reconstruction/</td>
<td>activity and right to use land</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Project applicant</td>
<td></td>
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</tr>
<tr>
<td>Reconstruction/</td>
<td>Quality of executed works</td>
<td>At the construction site</td>
<td>Visual monitoring and through register</td>
<td>Permanently during the works execution and construction site removal</td>
<td>Poor monitoring and works execution quality assessment can cause damages to environment, bad quality structures and usage of poor quality material, can result in damages to structures and expose inhabitants to risks and possible accidents</td>
<td>Incorporated into the supervision implementation costs</td>
<td>Contractor</td>
<td></td>
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</tr>
<tr>
<td>Repair</td>
<td>Quality of material that is installed</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Supervising body</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Construction site</td>
<td>Waste remnants and soil degradation</td>
<td>At the project location</td>
<td>Visually</td>
<td>After the works completion</td>
<td>In order to establish whether all waste was removed from the construction site whether field was restored</td>
<td>Incorporated into the supervision implementation costs</td>
<td>Contractor</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>site closure</td>
<td></td>
<td></td>
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<td></td>
<td>Supervising body</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>POTENTIAL NEGATIVE IMPACT</td>
<td>MONITORING PARAMETER</td>
<td>MONITORING SITE</td>
<td>MONITORING TYPE / EQUIPMENT</td>
<td>TIMING</td>
<td>RESPONSIBLE PARTY</td>
<td></td>
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</tr>
<tr>
<td>Pollution of water and soil because of improper disposal of excavated materials and construction wastes</td>
<td>Existence of zones/sites for preliminary accumulation of wastes</td>
<td>At and near work site</td>
<td>Inspection</td>
<td>During construction works</td>
<td>Contractor, Supervisor Engineer</td>
<td></td>
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</tr>
<tr>
<td>Loss of top soil due to temporary access roads and work areas, Landscape degradation</td>
<td>Clear delineation of access roads and work sites to prevent their expansion</td>
<td>At access roads and work sites</td>
<td>Inspection, Observation</td>
<td>During construction works</td>
<td>Contractor, Supervisor Engineer</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cleaning of access roads and work sites after construction works completion</td>
<td>At access roads and work sites</td>
<td>Inspection, Observation</td>
<td>After construction works</td>
<td>Contractor, Supervisor Engineer</td>
<td></td>
<td></td>
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<td>Restoration of landscape to quasi-original condition after completion of works and after use of quarries</td>
<td>At work site and quarries</td>
<td>Unannounced Inspection</td>
<td>After works completion</td>
<td>PIT Environmental Specialist</td>
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<td>Temporary air pollution (dust) related to the transportation of construction materials and truck traffic</td>
<td>Sprinkling of water to suppress the dust</td>
<td>At access roads and work sites</td>
<td>Inspection, Observation</td>
<td>During construction works</td>
<td>Contractor, Supervisor Engineer</td>
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<td>Noise and vibration disturbances</td>
<td>Termination of construction works at the established time (e.g. work on daylight hours)</td>
<td>At access roads and work sites</td>
<td>Inspection, Observation</td>
<td>During construction works</td>
<td>Contractor, Supervisor Engineer</td>
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<td>Measure noise levels (Db)</td>
<td>At and near the work site</td>
<td>Inspection</td>
<td>During construction works</td>
<td>Contractor, Supervisor Engineer</td>
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<td>Staff safety</td>
<td>Use of protective equipment, organization of by-passing traffic</td>
<td>At work site</td>
<td>Inspection</td>
<td>During construction works</td>
<td>Contractor, Supervisor Engineer</td>
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<td>Degradation of the canal</td>
<td>O &amp; M</td>
<td>At work site</td>
<td>Regular supervision inspection</td>
<td>During canal operation</td>
<td>PWMC: “Srbijavode”, “Vode Vojvodine”, “Beogradvode”</td>
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6. ENVIRONMENTAL MANAGEMENT RESPONSIBILITIES

For each potential impact the EMP identifies:

- the proposed mitigation measure(s); and
- the parties or agencies charged with implementing those measures, separated into:

- Executing agencies responsible for executing the measure. For this specific assignment the executing agencies (e.g. contracted design institutes) shall ensure that all necessary agreements and permits (e.g. EIA conclusion, permits for water use and discharge and for the disposal of excavated materials, wastes, and demolition debris) are obtained from relevant state and local authorities before the construction works are tendered out. Construction contractors shall take the responsibility for physical implementation of mitigation measures provided under the EMP during the construction phases according to the Bank’s policies and Serbia environmental legislation.

- Supervising agencies responsible for supervising the executing agencies to ensure that they execute the mitigation measures as planned. The Directorate of Water and Serbia Floods Emergency Recovery Project Implementation Team (PIT) will be responsible for supervising the timely, proper and reliable implementation of works and measures in the consequence provided by the EMP. PIT will also ensure that all necessary agreements and permits are obtained by appropriate contractors from relevant state and local authorities before the construction works are tendered out. The World Bank during supervision missions may request randomly to check if such permits are issued and are valid (e.g., not expired) as well as if the EMP mitigation and monitoring aspects are implemented on the ground during the construction phases according to the Bank’s policies and Serbia environmental legislation.

- Various Ministries give different permits. Ministry of Finance together with Ministry of Infrastructure and Ministry of Agriculture and Environmental Protection control License process for works. Ministry of Agriculture and Environmental Protection with Directorate of Water, The Public Water Resources Management Companies Srbijavode, Beogradvode and Vode Vojvodine providing preparation of water resources management technical documentation, different kind of license requested for works and supervise construction, organization and implementation of water pollution protection measures. Hydro meteorological Institute take water samples and monitoring quality of water.

6.1. Environmentally sound clauses for civil works contracts

Most construction phase impacts will be possible to mitigate by including appropriate clauses into the civil works contracts. Revisions of clauses should cover, but not limited to, the following issues:

- Compliance with general national environmental guidelines;
- Compliance with relevant World Bank Operational Policies;
- Protection of Historic-cultural monuments;
- Adequate disposal of construction and excavation wastes;
- Proper location of construction camps;
- Restoration of the quasi-original conditions of landscape in construction sites after works completion;
- Occupational safety and health (Consultants and contractors working on the program will be required to adhere to all applicable laws and regulations controlling workplace health and safety), etc.

Construction works contracts should include this EMP with its Environmental Mitigation Plan and Environmental Monitoring Plan presented within the chapter 4 and chapter 5 of this EMP document.
7. IMPLEMENTATION ARRANGEMENTS

The Office for Reconstruction will be responsible for overseeing the overall project implementation. Project management functions and day to day operations will be the responsibility of EPS, the Directorate for Agrarian Payments (DAP) (with the support of Treasury), and the Project Implementation Unit (PIU) established under DWM.

8. MONITORING AND REPORTING ARRANGEMENTS

8.1. FERP Project Monitoring

The FERP project will be monitored by EPS, and the PIU under the DWM. Information and data collected at each of the implementation agencies will be fed into overall monitoring and evaluation (M&E). The Office for Reconstruction will oversee M&E activities regularly through the project reports, evaluate the results achieved and guide the implementing agencies on corrective management actions.

The Construction contractor is obliged to perform all monitoring activities (sampling, measurement, etc.) prescribed within the Monitoring Plan of EMP document produced for project on which the Contractor is engaged.

Supervision Consultant is responsible to monitor all construction activities, including environmental protection during project rehabilitation. PSC will be authorized to perform additional sampling in case he finds this needed.

8.2. Environmental Monitoring Plans

Monitoring plan for FERP projects should be in respect of the bidding documents. The main components of the monitoring plans include:

- Environmental issue to be monitored and the means of verification
- Specific areas, locations and parameters to be monitored;
- Applicable standards and criteria;
- Monitoring of the procurement of materials (checks that valid permits are in place)
- Duration
- Institutional responsibilities for monitoring and supervision

8.3. Reporting Arrangements

8.3.1. Contractor to PIU

The Contractor will prepare his compliance reports in respect to EMP and his SSIP as a Quarterly Progress Reports and submit them to PIU, in both Serbian and English language, in hard copy and electronic versions.

Construction Contractor will provide quarterly reports to PIU which document the environmental mitigation and protection measures, together with prescribed monitoring activities carried out during that quarter's reporting period. Construction Contractor will take care of the environment quality according to the mitigation and monitoring plan which are part of EMP.

The same applies to the Environmental Monitoring and Supervision Contractors for their part of mitigation and environmental monitoring activities.

If any kind of accident or endangerment of environment happens, reporting will be immediate. PIU and the Contractor have joint responsibility for reporting and investigating incidents. The Contractor is obliged to inform the project manager and local authorities about accident immediately after it happened.

8.3.2. Project Supervision Consultant to PIU
The findings of the regular monitoring activities, including activities specified in the Generic Monitoring Plan, carried by the Contractor will be included in the quarterly PSC progress reports.

8.3.3. PIU to MAEP, WB, Annual Environmental & Social Report

Each Contractor is obliged to produce and deliver to PIU an Annual Environmental and Social Report (AESR) covering all project activities during a calendar year. PIU shall provide Annual reports to MAEP and IFIs regarding the status of implementation of mitigation measures by the Contractors, additional mitigation measures that may need to be implemented, incidents of non-compliance with applicable environmental permits, complaints received from local residents, NGOs, etc. and how these were addressed. In case of fatalities or major incidents on site the PIU will immediately report to WB.

Monitoring and compliance in accordance with ESMF and site specific EMPs, including monitoring of implementation of site-specific measures on each sub-project/section during project implementation will be undertaken by PIU and its implementation unit, and reported in writing to the Bank on semi-annual basis. An environmental specialist will be appointed to the Project by PIU to ensure quality in the implementation of EMPs.

9. PUBLIC CONSULTATIONS AND PUBLIC DISCLOSURE OF THE EMP

Draft version of EMP will be publicly disclosed in the Ministry of Agriculture and Environmental Protection the Directorate of Water building during March 2015, on period of two weeks.

10. REFERENCES

1  Detailed design – Construction of flood protection embankment, upstream of Jasenicka River for protection of Radujevac municipality from Floods caused by Danube River, MP "Velika Morava", September 2009


3  Project Appraisal Document, PAD1129, Serbia - Floods Emergency Recovery Project, September 2014


6  Environmental and Social Management Framework, ESMF, Floods Emergency Recovery Project - P152018, February 2015

Annex 1

LEGISLATION
MAIN SERBIAN LEGISLATION:

ANNEX 1: RELEVANT NATIONAL LEGISLATION AS OF JANUARY 2015

The main laws and regulations currently in force in Republic of Serbia which are relevant to the environmental protection during planning, design, construction and operating of this Project are listed below:

2. Law on nature protection (“Official Gazette of RS”, 36/09)
3. Law on environmental protection (“Official Gazette of RS” No. 135/04, 36/09, 72/09)
7. Law on noise protection (“Official Gazette of RS”, 36/09, 88/10)
8. Law on water (“Official Gazette of RS”, 30/10, 93/12)
9. Law on forest (“Official Gazette of RS”, 46/91, 83/92, 54/93, 60/93, 53/93, 67/93, 48/94, 54/96, 101/05)
10. Law on air protection (“Official Gazette of RS”, 36/09)
11. Law on Safety and Health at Work (“Official Gazette of RS”, 101/05)

Regulations established on the basis of the Law on EIA include the following:

12. Decree on establishing the List of Projects for which the Impact Assessment is mandatory and the List of projects for which the EIA can be requested (“Official Gazette of RS” No. 114/08)
13. Rulebook on the contents of requests for the necessity of Impact Assessment and on the contents of requests for specification of scope and contents of the EIA Study (“Official Gazette of RS” No. 69/05)
14. Rulebook on the contents of the EIA Study (“Official Gazette of RS” No. 69/05)
15. Rulebook on the procedure of public inspection, presentation and public consultation about the EIA Study (“Official Gazette of RS” No. 69/05)
16. Rulebook on the work of the Technical Committee for the EIA Study (“Official Gazette of RS” No. 69/05)
17. Regulations on permitted noise level in the environment (“Official Gazette of RS” No. 72/10)
18. Decree on establishing class of water bodies (“Official Gazette of SRS” No. 5/68)
19. Regulations on dangers pollutants in waters (“Official Gazette of SRS” No. 31/82)

Other relevant Serbian legislation

20. Law on confirmation of convention on information disclosure, public involvement in process of decision making and legal protection in the environmental area (“Official Gazette of RS”, 38/09)


Annex 2

FINAL ENVIRONMENTAL APPROVAL
Annex 2: Final Environmental Approval will be obtained prior to commencement of the works
Annex 3

REPORT ON PUBLIC CONSULTATIONS
ANNEX 3: REPORT ON PUBLIC DISCLOSURE AND PUBLIC CONSULTATION

To be completed after Public Consultations