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APPENDIX J: E&S MANAGEMENT AND MITIGATION PLAN

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**Technical Assistance to Connectivity in the Western Balkans 2
(CONNECTA 2)
NEAR/2022/EA-RP/0081**

Sub-Project
Code: CONNECTA2-TRA-INFR-BIH-DD-01

**Technical assistance for the preparation of due diligence
of detailed design and cost estimate and gap analysis of
the existing feasibility study and ESIA for Foca-Hum in
BiH**

Implemented by **M**
MOTT
MACDONALD **M** in consortium with **COWI**

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APPENDIX J-1: MITIGATION AND MANAGEMENT PLAN

Table 1: E&S Mitigation and Management Plan

General

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|--------|---|--|--|--|---|
| 1) | Design | Unassessed environmental and social risks due to significant design changes | <ul style="list-style-type: none"> Prepare and implement a Change Management Procedure to address any significant design changes during Project implementation. The procedure will define the process for screening proposed changes for potential environmental and social risks and impacts, determining whether additional assessment, consultation, permits or mitigation measures are required, and ensuring that any necessary additional E&S measures are incorporated into the ESMP and implemented in a timely manner. | <ul style="list-style-type: none"> PRS; Contractor and Supervision Engineer to support implementation and review, as applicable | <ul style="list-style-type: none"> Availability of Change Management Procedure Records of design changes screened for E&S risks Documentation of additional mitigation measures (if applicable) | <ul style="list-style-type: none"> Change Management Procedure prepared and implemented. 100% of significant design changes screened for E&S implications. All required additional mitigation measures incorporated into the ESMP and implemented. |

Biodiversity

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|---------------------|--------|--|---|--|---|---|
| Biodiversity | | | | | | |
| 2) | Design | Adverse impacts due to inadequate planning of works and siting of Project components | <ul style="list-style-type: none"> Avoidance and mitigation measures must be incorporated into the Main Design, ensuring alignment of the Project with EBRD PR6 and WB ESS6. During the design phase, relocate the spoil disposal sites 04B, 04C, 03A, 03B, 03C and 03D from locations that intersect with or are in close proximity to <i>Bombina variegata</i>, a CH-trigger species, breeding sites. Establish clearly defined avoidance zones around sensitive sites during Main Design development. Avoidance zones that must be clearly referred to in the new Main Design include Annex I priority habitat types¹ triggering | <ul style="list-style-type: none"> Design developer to include requirements in the Main Design PRS to include requirements in the Tender Documentation, monitor and review | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> Main Design includes the requirement for the relocation of disposal sites, avoidance zones, bat-friendly structures on bridges and hop-overs. |

¹ G1.A4 *Tilio-Acerion* forests of slopes screes and ravines (corresponding to Annex I priority habitat type 9180*), G1.1 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) (91E0*), E1 Semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (*important orchid site) (6210*), C2.121 Petrifying springs with tufa formation (*Cratoneurion*) (7220*)

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| | | | <p>CH-criteria, small fragments of CH trigger <i>Adenophora liliifolia</i> habitat, important breeding sites of CH species <i>Bombina variegata</i>, River Drina and its riparian zone, each with a minimum 5-meter buffer zone. Construction of access roads, vegetation clearance, installation of facilities, material disposal and all other construction activities are strictly prohibited within these zones. No spoil material may be deposited within or adjacent to these areas. Where avoiding these zones is not feasible, lack of feasible solutions is to be demonstrated, and corrective measures must be implemented. This includes the minimisation of impacts and restoration of habitats where possible, along with update of the BMP.</p> <ul style="list-style-type: none"> ■ Culvert entrances must be designed as square, elliptical or rectangular, with a diameter of 0,5 m at minimum to preserve aquatic habitat connectivity. ■ Directional fencing shall be planned alongside ground-level parts of the route near critical habitats for amphibians. This must be a fine-mesh or plastic or geotextile fence, with a maximum mesh size of <1 cm, and a height of approximately 40–60 cm above ground. The fence must be partially buried (at least 10 cm) or have a bent lower edge to prevent animals from passing underneath. The upper edge should be smooth or slightly overhanging to prevent climbing. ■ Main Design is to include the requirement for design of hop-overs for bats. Hop-overs must be designed and later implemented along commuting corridors for birds and bats, particularly along hedgerows, treelines, or riparian corridors, to reduce collision risk. This will be done by preserving, where feasible, or establishing all vegetation on both sides of the road to encourage animals to cross at higher, safer altitudes. Suggested locations for these structures are: from km 17+193 to km 17+275 and from km 18+044 to km 18+125. ■ To further support habitat connectivity and net gain efforts for residual impacts on bats, | | | |

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| | | | <p>selected bridge structures (chainages 6+790–6+850, 7+700–7+900, 9+940–10+060, 11+413–11+555, 13+355–13+410, 15+270–15+350) will incorporate rough-textured roosting and commuting features on undersides, subject to detailed design confirmation.</p> <ul style="list-style-type: none"> The aforementioned design requirements are to be included in Main Design by the Contractor and PRS is in charge to ensure the measures are included in the Tender Documents and implemented in line with the ESMMP. | | | |
| 3) | Construction | Habitat loss due to vegetation clearance and preparation of construction site and during the performance of construction works, fragmentation of habitats and potential additional and unplanned disturbance of habitats | <ul style="list-style-type: none"> Contractor is to engage an Ecological Clerk of Works (ECoW) to coordinate the implementation and monitoring of the ESMMP and BMP. Contractor to develop Landscape and Habitat Restoration Plan (LHRP) and Invasive Species Management Plan (ISMP) as a part of CESMP as per contents guidance provided in BMP. Plan to plant fast-growing native species within first three months of construction phase, combined with temporary screens until vegetation matures to ensure adequate preparation of bat hop-overs if preservation of woody vegetation in designated hop-over sites proves to be unfeasible. EcoW to clearly mark areas for vegetation clearance with biodegradable paint of high visibility, flags or similar markings. Avoidance zones must also be physically demarcated on-site and their integrity monitored continuously during construction activities. Schedule vegetation clearance outside sensitive seasons for herpetofauna and bird nesting season (i.e. this activity shall not be implemented between March and July). Vegetation clearance must be conducted in a progressive and phased manner to enable fauna to move away from the area of works, disperse into surrounding habitats and to avoid fauna from being isolated in fragmented areas of habitat. As the conditions of the Project area may change between the survey period and the start | <ul style="list-style-type: none"> Contractor to implement PIU and Supervision Engineer to monitor | <ul style="list-style-type: none"> Size of impacted area outside of designated construction and vegetation clearance areas. Absence/presence of invasive species spread. Occupancy rates of bat boxes and reptile hibernacula. | <ul style="list-style-type: none"> ECoW engaged and active on-site before start of vegetation clearance. Developed and approved LHRP and ISMP integrated in CESMP prior to start of earthworks. Reports on pre-clearance survey results: species observed, location of roosts (checklist/report filed and dated). All avoidance zones marked and adhered to. No disturbed habitat outside of the area necessary for construction. Clearance conducted outside sensitive periods. Erosion control and water flow measures implemented at all relevant sites. Riparian areas restored using native species. |

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| | | | <p>of construction, the ECoW must conduct pre-clearance surveys. The aim is to check for presence of slow moving fauna or bat roosts in old trees (diameter at breast height DBH greater than 100 mm), buildings to be demolished (if any).</p> <ul style="list-style-type: none"> ■ If bat presence in hollow trees or buildings set for demolition is confirmed and their removal cannot be prevented, bats shall be relocated and compensatory measures must be implemented in line with BMP. ■ Avoid unnecessary cutting of older trees and removal of dead wood. Where tree removal is unavoidable, felling during dawn or dusk must be avoided . ■ Restrict the movement of construction machinery and transport exclusively to the designated access road alignment and construction areas to ensure maximum protection of habitats and prevent additional disturbance. If additional areas are required (e.g., access roads), the use of natural areas such as woodlands and grasslands must be avoided, and only already modified or degraded areas (e.g., existing roads or non-natural habitats) may be used. ■ Disposal of material is to be well managed in line with CESMP, in order to prevent the degradation of natural vegetation and invasion of non-native species into the surrounding habitats. Removed topsoil rich on organic matter must be deposited in controlled way and later used for arrangement of embankments and cuts. ■ The ECoW shall provide appropriate training tailored to the needs of construction personnel to help achieve minimal impact on species in the construction areas and ensure the safety of construction workers when encountering fauna. ■ Enforce good behaviour by construction workers, including prohibition of hunting, trapping and general harassment of wild animals and excessive collection of wild herbs, and | | | <ul style="list-style-type: none"> ■ Reptile hibernation and shelter structures built at designated locations. ■ At least 35 bat boxes installed as instructed. |

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| | | | <p>education on preventing and controlling bush fires.</p> <ul style="list-style-type: none"> ■ Prevent the alteration of the hydromorphology of streams by reinforcement of their banks in accordance with measures under <i>Surface Water</i>. ■ Implement measures for slope stabilisation, erosion control and sedimentation run-off in line with mitigation measures under <i>Soil and Land Use</i>. <p>Compensations measures to address residual impacts during construction include:</p> <ul style="list-style-type: none"> ■ Where habitat removal affects reptile species (particularly <i>Vipera ammodytes</i>, <i>Zamenis longissimus</i> and <i>Coronella austriaca</i>), artificial hibernacula and oviposition structures shall be constructed as compensation for 6.058 ha of anticipated habitat loss. A minimum of 5 structures shall be installed, proportionate to the calculated compensation requirement (~1 ha equivalent habitat). The proposed number of hibernacula exceeds the minimum requirement and is considered proportionate to the extent and capacity of the surrounding habitat, ensuring the achievement of net gain. Structures shall be located ≥100 m from the road in suitable basking/foraging areas, designed as south-facing, well-drained features (e.g. soil mounds or subsurface structures 50–100 cm deep using rocks, logs, and organic material), and installed prior to earthworks. Indicative placement includes localities at km 6+600, km 12+100–12+425, and km 17+650–17+750. Structures shall be protected from disturbance, monitored for use, and maintained. ■ The effective loss of moderate to high-quality woodland habitat of <i>Barbastella barbastellus</i> and <i>Nyctalus noctula</i> is estimated at 5.09 ha. To address residual impacts and improve local roosting possibilities, a provision of at least 35 bat boxes per species will be installed. This will include crevice-type boxes for <i>B. barbastellus</i> and cavity boxes for <i>N. noctula</i>, placed along woodland edges and riparian corridors within 50-100 m of the road. Boxes will be installed at | | | |

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|-----|--------------|--|---|--|--|--|
| | | | varying heights (2–6 m for <i>Barbastella</i> ; 4–10 m for <i>Nyctalus</i>), with a minimum density of three boxes per km. | | | |
| 4) | Construction | Pollution, dusting and further disturbance of habitats, flora and fauna due to increased level of noise, vibration and light | <ul style="list-style-type: none"> ■ Use of herbicides as a tool for vegetation clearance is prohibited. Legally permitted herbicides are only allowed in management of invasive species populations. ■ Avoid the use of hazardous substances and materials, so as to protect the environment from their potentially harmful impacts. ■ Ensure regular maintenance of construction vehicles and machinery to prevent malfunctions and to avoid leakages of oil and fuel. ■ Project construction will not be undertaken at dusk, dawn and at night to avoid disturbance to nocturnal and crepuscular fauna (i.e., bats) from increased noise and vibration. ■ Where lighting is required, it must be directional, non-UV and used only when necessary. ■ Regularly clean paved roads and sprinkle them during dry seasons to prevent dust generation. Prohibit transporting materials without proper covering. ■ Implement all mitigation measures under <i>Surface Water, Soil and Land Use, Air Quality, Noise and Vibrations and Waste and Materials Management</i>. | <ul style="list-style-type: none"> ■ Contractor to implement ■ PIU and Supervision Engineer to monitor | <ul style="list-style-type: none"> ■ Pollution monitoring as provided in <i>Monitoring and Supervision</i> | <ul style="list-style-type: none"> ■ KPIs as provided under <i>Surface Water, Soil and Land Use, Air Quality, Noise and Vibrations and Waste and Materials Management</i>. |
| 5) | Construction | Potential fatalities or injuries of fauna species due to vegetation removal and movement of heavy machinery | <ul style="list-style-type: none"> ■ Adequately dispose of organic and inorganic material so as not to be piled up on or near the construction site. This will ensure fauna is not attracted to the construction site for foraging or shelter opportunities. ■ If nests or roosts are discovered during construction, all work in the immediate vicinity shall be halted. The ECoW shall assess the site and either opt for relocation or restriction of work until juveniles have hatched, birds are fledged or bats have left the roost within a zone of 25 m around the site. All construction personnel must be informed of the protocol and trained to recognise potential nesting or breeding sites to ensure rapid response and minimise risks to sensitive species. | <ul style="list-style-type: none"> ■ Contractor to implement ■ PIU and Supervision Engineer to monitor | <ul style="list-style-type: none"> ■ Number of nests/roosts discovered during construction. ■ Number of speed-related wildlife incidents (e.g., roadkill). | <ul style="list-style-type: none"> ■ All potentially harmful activities supervised by ECoW. ■ No suitable reptile habitat created at construction sites. ■ No nests/roosts affected. ■ All pits filled or equipped with ramps if open over 24 h and no fauna mortality incidents in open pits. ■ Speed limit signage placed and visible at sensitive locations. |

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| | | | <ul style="list-style-type: none"> Deep pits and excavations should be filled in as soon as possible, following works to avoid animals being entrapped. If they are created for longer than 10 days, they should be equipped with escape ramps and crossing points. Enforce vehicle speed limits at the construction site near critical habitats, especially where the frequency of records was the greatest, as well as near water bodies. | | | <ul style="list-style-type: none"> No wildlife fatalities due to speeding near key habitats. |
| 6) | Operation | Habitat fragmentation, spread of invasive species | <ul style="list-style-type: none"> Conduct regular road maintenance including timely road surface repairs, roadside vegetation management, frequent debris removal to prevent hazards, and upkeep of drainage structures and culverts. The bridges along the road alignment, which are constructed as open passages for wildlife, must be maintained and kept passable during operation phase. Perform periodic biodiversity surveys in line with BMP focusing on period from early spring to early summer to cover activity periods of most species groups, and autumn to cover migration periods for bats and birds for the first three years of operation. This will also include monitoring of success of restoration of habitats in line with BMP. Perform continuous annual monitoring of invasive species and implement adaptive control measures if their spread is observed. | <ul style="list-style-type: none"> PRS | <ul style="list-style-type: none"> Survival, growth and coverage rates of planted native species Number and spatial distribution of invasive species Structure, positioning and use of artificial shelters, hibernacula, bat boxes, nesting boxes | <ul style="list-style-type: none"> All damages to fence or blockages to culverts repaired within 7 days. Area under bridges maintained and kept passable for fauna. At least 2 seasonal surveys per year for first three years of operation. All artificial shelters inspected as per schedule; structures adjusted if no use detected in two cycles. Demonstrated continuous decline in invasive species cover. Success of revegetation as given in the BMP. Seasonal hibernacula inspections conducted; damaged structures restored, and signs of usage recorded. |
| 7) | Operation | Pollution and disturbance | <ul style="list-style-type: none"> To prevent contamination, stormwater runoff from road surfaces shall be collected via sedimentation chambers in manholes and vegetated swales before being released into the environment. Regular maintenance of drainage infrastructure is mandatory. | <ul style="list-style-type: none"> PRS | <ul style="list-style-type: none"> Pollution monitoring as provided in <i>Monitoring and Supervision</i> | <ul style="list-style-type: none"> KPIs as provided under <i>Surface Water, Soil and Land Use, Air Quality, Noise and Vibrations and Waste and Materials Management</i>. |

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|-----|-----------|--------------------------------------|---|--|--|---|
| | | | <ul style="list-style-type: none"> ■ To the maximum extent practicable, while allowing for public safety, use low intensity energy-saving lighting (e.g., LEDs) that provides the minimum lumens needed for the task. Avoid bright white light, such as is often used in LEDs, metal halide, halogen, fluorescent, mercury vapor and incandescent lamps. Select lighting with a Correlated Color Nationwide Avoidance & Minimization Measures Version 2, Updated July 2024 5 Temperature (CCT) that does not exceed 3000K in urban areas and does not exceed 2200K outside of settlements, and areas prone to fog. ■ Implement measures as given under <i>Surface Water, Soil and Land Use, Air Quality, Noise and Vibrations</i> and <i>Waste and Materials Management</i>. | | | |
| 8) | Operation | Collision risk for all species group | <ul style="list-style-type: none"> ■ Maintenance staff will conduct monthly roadkill surveys along selected road segments for a minimum of three years post-construction in line with BMP. Data will be used to calculate roadkill indices per kilometer, enabling the identification of mortality hotspots and temporal trends. A designated, qualified ecologist appointed by PRS will be tasked with analysing the acquired data. If roadkill rates exceed baseline averages established in the first year of operation by more than 20%, adaptive management measures will be triggered. ■ Targeted interventions at identified hotspots may also include habitat modification and the installation of deterrents to reduce wildlife-vehicle collisions. ■ Regular mowing will be implemented to make verges less attractive, while avoiding the breeding season to prevent nest destruction. ■ In confirmed bird mortality hotspots, vegetation may be entirely removed and replaced with gravel or other non-vegetative ground cover to further discourage bird presence and reduce collision risk. | <ul style="list-style-type: none"> ■ PRS to engage external consultancy | <ul style="list-style-type: none"> ■ Number of roadkill per km. | <ul style="list-style-type: none"> ■ Register in place for registering of potential roadkill. ■ Adaptive measures implemented if roadkill rates exceed baseline by >20%. |

Hydrogeology and Groundwater

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|-------------------------------------|--------------|--|---|--|---|---|
| Hydrogeology and Groundwater | | | | | | |
| 9) | Construction | Interruption of groundwater flow due to deep excavations | <ul style="list-style-type: none"> ■ In case groundwater is encountered during works, particularly when excavating foundation pits, ensure proper drainage via manually constructed drainage channels or sump pits with low-capacity pumps. ■ Captured water should be treated in sedimentation basins before discharge into the environment². ■ If future design changes result in bridge foundations being located directly in riverbeds, temporary water diversion and control measures must be applied to allow dry working conditions. | <ul style="list-style-type: none"> ■ Contractor | <ul style="list-style-type: none"> ■ Groundwater monitoring (during excavation): ■ Depth to groundwater table (via piezometers or manual observation) ■ Presence of groundwater seepage in excavation zones ■ Pumping rates from sump pits (liters/hour) ■ Frequency and duration of dewatering activities ■ Sedimentation basin functionality: ■ Retention time in the basin ■ Sludge depth or frequency of cleaning ■ Visual inspection for overflow or short-circuiting ■ Water quality monitoring (before discharge): Total Suspended Solids (TSS), Turbidity (NTU), pH, oil and grease (if construction equipment is used nearby) ■ Flow rate of discharged water from sedimentation basins | <ul style="list-style-type: none"> ■ All polluted groundwater and excavation water is treated before discharge and all discharges meet applicable water quality standards. ■ Dewatering systems are in place and operational in all excavation areas with groundwater inflow; sedimentation basins are cleaned when sludge reaches 25-30% of design volume. ■ In-stream works are preceded by temporary flow diversions; all temporary drainage and sediment control structures are inspected and maintained weekly; and no visible turbidity increase is observed downstream during construction. |

² Sedimentation is generally sufficient; the final decision will be based on the results of water quality testing, in accordance with the Rulebook on Conditions for Discharge of Wastewater into Surface Waters (Official Gazette of Republika Srpska, No. 44/01).

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|--------------|--|---|---|---|--|
| 10) | Construction | Impact on local water supply systems and charity fountains due to disruption of the connection between upstream springs and downstream users | <ul style="list-style-type: none"> ■ Conduct a field survey before the start of construction in this section to identify all hydrogeological features and develop an inventory of springs and users, including a baseline assessment. ■ Design culverts or ducts beneath the road to preserve existing water supply lines or provide an alternative, upgraded water supply system to all affected users before construction begins, ensuring continuous supply. | <ul style="list-style-type: none"> ■ PRS in cooperation with the selected Contractor | <p>Pre-construction field survey & inventory:</p> <ul style="list-style-type: none"> ■ Number and location (coordinates) of identified springs. ■ Type and location of groundwater-dependent users (households, agriculture, etc.) ■ Yield/discharge rate of springs (litres/second) ■ Water quality of springs (e.g., pH, conductivity, nitrate, coliforms) ■ Photographic and descriptive record of each hydrogeological feature <p>Baseline assessment:</p> <ul style="list-style-type: none"> ■ Existing water use volumes (household or agricultural use) ■ Existing infrastructure condition (pipes, tanks, supply lines) ■ User satisfaction/perceived reliability of water supply <p>Infrastructure protection / alternative supply measures:</p> <ul style="list-style-type: none"> ■ Culvert/duct construction status (per design plan) ■ Number of existing pipelines preserved ■ Number of new or upgraded water supply connections ■ Water supply continuity logs during | <ul style="list-style-type: none"> ■ Pre-construction field survey and baseline assessment done ■ Continuity and protection of water supply ensured - 100% of affected users are connected to an alternative or upgraded supply system before any disruption of existing lines. ■ Zero unresolved complaints from groundwater-dependent users regarding water supply disruption or degradation during construction. |

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| | | | | | construction (any interruptions recorded) | |
| 11) | Construction | Deterioration of groundwater quality due to construction activities, presence of heavy machinery, concrete plants and worker camps | <ul style="list-style-type: none"> To prevent runoff of materials from the road platform to lower terrain, install drainage systems including sedimentation basins and oil-water separators. Treat wastewater from concrete batching plants to meet legal standards before discharge, in line with obtained Ecological (Environmental) Permit for its operation. Implement all mitigation measures under <i>Surface Water and Soil</i> to prevent accidental pollution. | <ul style="list-style-type: none"> Contractor | <ul style="list-style-type: none"> See under Surface Water and Soil | <ul style="list-style-type: none"> See under Surface Water and Soil |
| 12) | Operation | Risk to groundwater quality from untreated road runoff, especially near springs | <ul style="list-style-type: none"> Implement all mitigation measures under Surface Water. Discharge of road drainage near springs or into wells is strictly prohibited. The design must ensure compliance with this requirement. Conduct water quality testing of runoff prior to discharge, in accordance with valid Water Permits and Ecological (Environmental) Permit. | <ul style="list-style-type: none"> PRS to perform monitoring activities in the operational phase | <ul style="list-style-type: none"> Distance of drainage discharge points from any springs/wells (measured and mapped) to ensure no discharge within 50 m. The rest of monitoring parameters is the same as under Surface Water. | <ul style="list-style-type: none"> No runoff drainage outlets located within 50 meters of any identified spring or well Zero incidents of untreated runoff discharged into groundwater-sensitive areas Drainage infrastructure inspected and maintained monthly during operation The rest of KPI are the same as under <i>Surface Water</i>. |

Surface Water

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|----------------------|--------|--|---|---|---|--|
| Surface Water | | | | | | |
| 13) | Design | As part of the Main Design, a hydrological study was conducted in 2017. In the meantime, changes in local hydrology and rainfall patterns may have occurred. Moreover, the design of the open drainage | <ul style="list-style-type: none"> Prior to the design phase, ensure that hydrological and hydraulic assessments are reviewed and updated to reflect current rainfall patterns and changes in local hydrology. Ensure that all relevant calculations are based on a 100-year return period, using up-to-date rainfall intensity data and climate projections. | <ul style="list-style-type: none"> Design developer to include updated hydrological and hydraulic inputs in the Main Design, PRS to monitor and review | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> All hydrological and hydraulic assessments are reviewed and updated before final design approval; design calculations (culverts, channels, |

Environmental and Social Assessment Report – Environmental and Social Monitoring and Management Plan

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| | | <p>system and the dimensioning of culverts were based on hydraulic calculations using 100-year return period rainfall intensity data from this study, which no longer reflect current conditions.</p> | | | | <p>retention basins) are based on a 100-year return period; rainfall intensity data reflects the most recent national or regional datasets; and climate change projections are integrated into flood risk and drainage design.</p> <ul style="list-style-type: none"> ■ Final design documentation is independently reviewed or validated prior to construction. |
| 14) | Design | <p>Culverts can cause permanent alteration to water bodies if they are not designed with ecological and hydrological considerations in mind. Although the high number of culverts reflects the dense hydrographic network, the current design includes frequent and dispersed crossings, often duplicating drainage functions. Combining nearby drainage flows into shared crossings can reduce hydromorphological impacts and improve system efficiency.</p> | <p>During the design phase, the following measures should be taken into account when redesigning culverts:</p> <ul style="list-style-type: none"> ■ Optimisation of the number of culverts to reduce unnecessary crossings, avoid duplication of drainage functions, and minimise hydromorphological fragmentation, while maintaining adequate hydraulic capacity and natural flow paths. ■ Design culverts based on updated hydrological study results to ensure they reflect current rainfall patterns, flow regimes, and projected conditions. ■ Culverts should be sized and aligned to match the natural channel width, gradient, and flow capacity. ■ Use embedded or bottomless culverts where feasible, to maintain natural substrate and allow aquatic organism passage. ■ Avoid perched outlets and design the culvert invert to be below the streambed elevation (typically 20–30% embedded) to prevent drop formation. ■ Design culverts to preserve the natural riverbed profile and sinuosity, especially in ecologically sensitive areas. ■ Integrate natural bed material (e.g. gravel, cobbles) inside the culvert to simulate | <ul style="list-style-type: none"> ■ Design developer to integrate all culvert-related design requirements into the Main Design, PRS to monitor and review | <ul style="list-style-type: none"> ■ N/A | <ul style="list-style-type: none"> ■ Hydrologically and ecologically informed culvert design prepared ■ Final culvert design drawings and specifications are approved prior to construction, including input from a biodiversity expert for crossings in sensitive areas. |

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|-----|--------|--|---|---|---|---|
| | | | <p>streambed conditions and promote habitat continuity.</p> <ul style="list-style-type: none"> Ensure culvert capacity is sufficient for peak flow events (based on hydrological modelling). Design for unimpeded sediment transport to avoid upstream siltation or downstream erosion and ensure that sedimentation chambers in manholes are included at the inlets and outlets of all culverts to control flow velocity and retain suspended solids. Culvert design should follow best available practices at both local and international levels, as well as the national guidelines defined in the document <i>Guidelines for Road Design, Construction, Maintenance and Supervision</i>³. | | | |
| 15) | Design | The open drainage system does not include any provisions for the treatment of stormwater runoff from the road, which will occur only during rainfall events, particularly during periods of intense precipitation. This may result in an increased risk of water contamination, particularly in water retention zones, and could consequently lead to the formation of landslides. | <p>During the design phase, revise the design of the open drainage system in order to provide an adequate level of treatment for contaminated stormwater runoff generated and collected during precipitation events, together with surface runoff from the surrounding slopes within the same drainage system. The treatment concept should include the following elements:</p> <ul style="list-style-type: none"> Replace conventional concrete roadside channels with vegetated swales to enable pre-treatment of runoff from the road and adjacent slopes through natural filtration and sedimentation processes. Convey runoff from vegetated swales into sedimentation chambers in manholes located upstream and downstream of culverts to promote settling of suspended solids before discharge⁴; this is particularly important in identified water retention zones at the following chainages: <ul style="list-style-type: none"> km 5+675 – km 7+150 km 9+550 – km 10+775 km 11+950 – km 12+625 | <ul style="list-style-type: none"> Design developer to integrate all open drainage system design requirements into the Main Design, PRS to monitor and review. | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> The open drainage system is designed in line with the proposed requirements and approved prior to construction. |

³ Guidelines for Road Design, Construction, Maintenance and Supervision, Directorate for Roads of the FBiH and PRS, Sarajevo/Banja Luka, 2005.

⁴ Please note that in the open drainage system, road runoff and surface watercourses intersected by the road are both conveyed through the same culvert structures. As such, the discharge points for road runoff coincide with culvert outlets. Accordingly, a single sedimentation chamber in a manhole is foreseen per discharge point (culvert outlet), serving both to treat runoff from the road and to manage sediment transport and erosion from the natural watercourse. For this reason, the same measure is referenced both under culvert design and open drainage measures, particularly in the context of identified retention zones where the risk of pollutant accumulation is higher.

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
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| | | | <ul style="list-style-type: none"> - km 14+225 – km 14+800 - km 15+250 – km 16+275 - km 17+175 – km 17+675 - km 17+850 – km 18+525 ■ Vegetated swales shall be established using native grass and herbaceous species, supported by a topsoil (humus) layer. Where appropriate, additional granular and filter layers shall be incorporated to enhance treatment efficiency. ■ For bridge sections, stormwater runoff shall be collected from the bridge deck and connected to the road drainage system prior to discharge. ■ Vegetated swales shall be installed on one or both sides of the road, as appropriate and where technically feasible, depending on site-specific conditions. ■ During the design phase, envisage the installation of vegetative filter strips below the discharge points and further downstream along the intercepted watercourses within the identified retention zones, towards the final recipient (River Drina). Apply the measure where vegetation has been removed or is missing along the stream zone to support pollutant removal through natural filtration. | | | |
| 16) | Design | The regulation of watercourses intersecting spoil disposal sites and access roads has not been designed. | <ul style="list-style-type: none"> ■ During the design phase, prior to spoil site formation, carry out geological investigations to assess soil bearing capacity, terrain slope, groundwater level, presence of surface watercourses, and natural drainage patterns. ■ The design must ensure that all surface water flows intersected by spoil disposal sites and access roads are preserved and properly regulated⁵. ■ When designing drainage systems for spoil disposal sites and access roads, ensure that all previously defined culvert-related measures are applied, including optimisation of culvert layout, ecological and hydrological design principles, and erosion control measures. | <ul style="list-style-type: none"> ■ Design developer to carry out geotechnical investigations for spoil disposal sites, and to assess watercourse intersections at both spoil disposal sites and access roads, incorporating appropriate regulation measures into the Main Design | <ul style="list-style-type: none"> ■ N/A | <ul style="list-style-type: none"> ■ All necessary geotechnical investigations were conducted at all spoil disposal sites before design finalisation ■ Regulation of all intersected watercourses integrated in the Main Design ■ Final design documentation is independently |

⁵ According to the Main Design, two surface waterbodies are intersected by spoil disposal sites 03B and 06. As the relocation of sites 03B and 06 is already addressed under *Cultural Heritage and Tourism and Recreation*, their repositioning is anticipated. Accordingly, this and the following measure are defined in line with the expected changes in location.
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| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|--------------|---|---|--|--|---|
| | | | | <ul style="list-style-type: none"> PRs to review, approve spoil disposal sites, and monitor compliance with geotechnical and hydrological requirements. | | reviewed or validated prior to construction. |
| 17) | Construction | Change in river flow and recharge caused by the cutting or diversion of 61 permanent and intermittent streams due to the construction of road structures (culverts, spoil disposal sites, and access roads). | <ul style="list-style-type: none"> Hydraulic connectivity must be maintained during the construction of the culverts. When watercourse diversion is necessary, ensure the continuity of flow and ecological connectivity by establishing a temporary channel until the permanent one is completed. | <ul style="list-style-type: none"> Contractor(s) to implement and monitor | <ul style="list-style-type: none"> Visual inspections of culvert construction works, including documented observations confirming maintenance of hydraulic connectivity and ecological flow. | <ul style="list-style-type: none"> Hydraulic connectivity or ecological flow continuity was interrupted during culvert construction. |
| 18) | Construction | <p>Increased pollution risks to surface water bodies from construction works in close proximity to the Project footprint due to the following:</p> <ul style="list-style-type: none"> Direct discharge of pollutants related to construction activities; Sediment runoff during the construction of road infrastructure (e.g., embankments, cuts, bridges, culverts, and access roads); Sediment release during bridge construction near or within the riverbed; Introduction of sediments and contaminants through improper disposal of construction waste into water bodies; Accidental spills at the construction site (e.g., | <ul style="list-style-type: none"> Avoid the positioning of stockpiles near to watercourses (minimum 50 m) and ensure they are located outside areas at fluvial flood risk. Contain stockpiles with bunds or sediment fences and cover stockpiles when not in use. Manage runoff effectively during construction by installing sediment barriers between earthworks and the watercourse to prevent sediment from entering the water body. Implement measures such as silt fences, silt traps, filter bunds, settlement basins, and/or proprietary systems like a "siltbuster" to treat sediment-laden water generated on-site before it is discharged. Runoff containing fuels or harmful substances must be treated using appropriate physical and/or chemical methods, such as oil-water separators, sorbent materials, or equivalent systems, to remove pollutants before discharge into surface waters. Concrete mixing and washing must occur at least 500 m from watercourses. Batching plant wastewater must be treated using settling tanks. All runoff generated during construction must be treated using appropriate sediment and pollution control measures, and the treated water must comply with the <i>Rulebook on the Conditions for</i> | <ul style="list-style-type: none"> Contractor(s) to implement and monitor | <ul style="list-style-type: none"> Regular visual inspection and documented verification of all listed ESMMP measures related to construction sites, the positioning of stockpiles, sediment control measures, equipment maintenance zones, sanitation facilities, hazardous material storage areas, and adjacent surface waters to confirm proper placement, containment, operational practices, and absence of visible pollution (e.g. turbidity, sheen, discoloration, debris). Sampling and analysis of treated runoff, dewatering discharge and sanitary wastewater | <ul style="list-style-type: none"> Erosion and sediment control near watercourses is implemented in line with proposed mitigation measures, as verified by the Supervising Engineer. All temporary drainage measures, equipment maintenance zones, sanitation facilities, hazardous material storage areas, and adjacent surface waters to confirm proper placement, containment, operational practices, and absence of visible pollution (e.g. turbidity, sheen, discoloration, debris). Treated runoff from construction areas meets national discharge standards at all monitoring events; and zero discharges of untreated sediment-laden water occur. Treated wastewater from batching plants meets national |

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| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
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| | | <p>during oil or lubricant changes);</p> <ul style="list-style-type: none"> ■ Discharge of untreated wastewater from concrete batching and asphalt mixing plants; ■ Inappropriate disposal of various waste types along riverbanks. | <p><i>Discharging Wastewater into Surface Waters of RS</i>⁶ before being released into surface waters.</p> <ul style="list-style-type: none"> ■ Direct any water generated from dewatering processes through silt busters or sediment tanks before discharging it into any watercourse. If additional pollutants are present or these measures prove insufficient, further treatment may be necessary. ■ Once the number of construction camps has been determined (if any), access roads within each camp should, wherever feasible, be located at least 60 metres away from watercourses. Site roads and approaches to watercourse crossings must be kept clear of mud, and cleaning water must not be discharged into the watercourse. ■ Designing and constructing a system for collecting and treating drainage and sanitary wastewater within the worker camp(s), ensuring treatment meets both national and Project standards. ■ Ensuring that surface water runoff from the worker camp(s) and construction compounds is not discharged into surface water receptors without robust pre-treatment. ■ Ensure regular cleaning and maintenance of wastewater pre-treatment systems to maintain their effectiveness. ■ Providing portable toilets at the construction site, outside the worker camp(s). ■ The use of only clean materials for embankments near watercourses must be ensured. ■ Fuels and hazardous materials must be stored in bunded areas with cut-off drainage. Fuel should be in double-skinned tanks (110% capacity). No hazardous materials within 50 m of watercourses. ■ Waste fuels and liquids must be collected in leak-proof containers and removed from the site. ■ Machine repairs and oil changes must be done off-site, away from high-risk zones. Refuelling | | as per the Monitoring Plan (Annex J2). | <p>discharge standards at all monitoring events; and zero discharges of untreated wastewater occur.</p> <ul style="list-style-type: none"> ■ Sedimentation basins, oil-water separators, and settling tanks for batching plant wastewater are inspected weekly and maintained as needed (e.g. sludge accumulation <30% of design volume). ■ Pollution prevention and spill control measures are put in place as verified by the Supervising Engineer. ■ No pollution incidents were recorded during construction. |

⁶ Official Gazette of RS 44/01

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|-----------|---|---|--|---|--|
| | | | <p>and maintenance must occur on hardstanding at least 50 m from watercourses, with drip trays under static plant.</p> <ul style="list-style-type: none"> ■ Spill kits must be available on-site and staff trained in their use. ■ Conduct daily visual checks of surface waters to detect improper waste disposal or visible pollution (e.g. colour changes, sediment, spills). ■ Implement all mitigation measures under <i>Groundwater, Waste and Materials</i>, and <i>Soil and Land Use</i> to prevent accidental pollution. | | | |
| 19) | Operation | <p>Reduction in water quality in identified water bodies within the Project footprint:</p> <ul style="list-style-type: none"> ■ Direct release of intercepted contaminated stormwater runoff ■ Accidental spill of hazardous material resulting from traffic accidents ■ Generation of TWP on the road surface ■ Use of de-icing agents | <p><i>Drainage system:</i></p> <ul style="list-style-type: none"> ■ Implement mandatory and regular cleaning and maintenance of the drainage system to prevent blockages, maintain full functionality, and avoid uncontrolled discharges into the environment. ■ Implement all monitoring measures for stormwater runoff from the road prescribed by the Ecological (Environmental) Permit and the issued water-related permits, including any monitoring instructed by the competent environmental or water inspector or required in the event of accidental pollution. ■ In case monitoring requirements for stormwater runoff at all discharge points are not defined in the Environmental Permit and water-related permits, carry out monitoring during precipitation or heavy rainfall events within the first year of operation to establish water quality prior to discharge. Considering the expected volume of stormwater runoff from the road (100–500 m³), carry out monitoring up to eight times per year, in accordance with the <i>Rulebook on the Conditions for Discharging Wastewater into Surface Waters of RS</i>⁷, where initial results indicate the need for continued monitoring (where elevated concentrations of pollutants are identified). Otherwise, carry out monitoring three times per year as a control measure during precipitation events. ■ Conduct monitoring of stormwater runoff in compliance with the <i>Rulebook on the Conditions</i> | <ul style="list-style-type: none"> ■ PRS to implement and monitor | <ul style="list-style-type: none"> ■ Regular monthly or post-heavy rainfall inspection of drainage system functionality ■ Stormwater Runoff Monitoring, in line with Environmental Permit and issued water-related permits, and where not defined therein, in accordance with the applicable Rulebook requirements (precipitation-based monitoring, frequency up to 8 times/year or minimum 3 times/year, including key parameters such as Total Suspended Solids (TSS), Total Phosphorus, Mineral Oils, PAHs and Lead). ■ Inspection of availability of spill kits at their locations along the road. | <ul style="list-style-type: none"> ■ Drainage infrastructure functionality and water quality compliance are documented. ■ Stormwater runoff quality in line with national regulations. ■ The EPRP prepared and verified to include detailed spill prevention and response procedures. |

⁷ Official Gazette of RS 44/01

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
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| | | | <p><i>for Discharging Wastewater into Surface Waters of RS</i>⁸. Although stormwater runoff from roads is generally encompassed under industrial wastewater in the applicable <i>Rulebook</i>, parameters for this type of runoff are not explicitly defined. Therefore, in line with best available practices, include key parameters relevant for this type of runoff, namely total suspended solids, total phosphorus, mineral oils, polycyclic aromatic hydrocarbons (PAHs), and lead⁹.</p> <ul style="list-style-type: none"> ■ . ■ Include spill prevention procedures in the Emergency Preparedness and Response Plan (EPRP). <p>De-icing agents:</p> <ul style="list-style-type: none"> ■ Prioritise eco-friendly de-icing agents such as calcium magnesium acetate and potassium acetate. ■ Use grit or sand as a supplementary measure to improve traction (not for melting ice). ■ Use spreaders to ensure even distribution and prevent over-application. ■ Store de-icing agents in covered, secure areas to prevent contamination of soil and water. ■ Train staff in the proper handling, application, and storage of de-icing agents to minimise misuse and environmental impacts. ■ Combine de-icing with mechanical snow and ice removal to reduce reliance on chemical agents. ■ Use de-icing agents on the road surface both before and after snow events to prevent ice formation and enhance traction. ■ By implementing these recommendations, it is possible to balance the efficiency of de-icing measures with reduced environmental and infrastructural impact. ■ If using inorganic agents (e.g. salt/NaCl): <ul style="list-style-type: none"> - Avoid sodium chloride due to its high environmental impact. | | | |

⁸ Official Gazette of RS 44/01

⁹ Lead is included based on its detection in the Drina River during surface water quality monitoring conducted for this Project. However, if lead is not detected during the initial monitoring period, its further monitoring may be discontinued.

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
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| | | | <ul style="list-style-type: none"> - Use calcium chloride (CaCl₂) or magnesium chloride (MgCl₂) as less harmful alternatives. - Mix eco-friendly agents with reduced amounts of salt to balance cost and impact. | | | |

Soil and Land Use

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|--------------------------|--------------|--------------------------|--|--|--|--|
| Soil and Land Use | | | | | | |
| 20) | Construction | Removal of topsoil | <p>Prepare Topsoil Management Plan (TSMP) as a part of CESMP. The TSMP shall describe the following:</p> <ul style="list-style-type: none"> ■ topsoil stripping procedures and rules, depth and volumes, and supervision ■ stockpile design, management and location, ■ erosion hazard and erosion control, ■ runoff drainage/diversion, ■ maintenance of the stockpile and topsoil application procedure, ■ procedures for management of contaminated soil. ■ good planning of the material balance per sections, i.e. reuse of the excess soil resulting from cuts, ■ monitoring of soil quality during construction works as per the Monitoring Plan (Appendix J2). ■ topsoil to be properly removed before construction begins, stored and used post-construction for re-cultivation and slope stabilisation as per the Main Design recommendations, ■ removed soil heaps to be stabilised or covered (e.g., with textile) and temporarily stored away from riverbanks or erosion-prone sites. ■ TSMP to outline proper removal of fertile and potentially fertile soil layers. | <ul style="list-style-type: none"> ■ Contractor | <ul style="list-style-type: none"> ■ Visual inspection of <ul style="list-style-type: none"> – topsoil stripping activities (depth, volume, location). – condition and location of stockpiles. – signs of erosion or runoff near stockpile areas. – topsoil reuse in re-cultivation areas. – stabilised or covered topsoil heap. ■ Testing of soil quality as per the Monitoring Plan (Appendix J2). | <ul style="list-style-type: none"> ■ The TSMP is prepared to include mitigation measures, approved, and implemented before construction begins. ■ On-Site performance and compliance monitoring reveals no incidents of erosion or runoff from topsoil stockpiles ■ Implementation aligns with Main Design recommendations on soil reuse and slope stabilisation as verified by the Supervision Engineer. |
| 21) | Construction | Soil compaction | <ul style="list-style-type: none"> ■ The movement of heavy machinery should be limited in the construction site and access roads. ■ Mechanisation and technology that causes minimal tremors and harmful impacts that can | <ul style="list-style-type: none"> ■ Contractor | <ul style="list-style-type: none"> ■ Visual inspection of soil condition in and around the construction site. | <ul style="list-style-type: none"> ■ TSMP prepared and implemented including measures for |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
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| | | | <p>lead to soil compaction should be used during road construction.</p> <ul style="list-style-type: none"> All above listed measures for TSMP to be included in CESMP and implemented accordingly. | | | addressing compaction. |
| 22) | Construction | Occurrence of landslides and erosion | <ul style="list-style-type: none"> Slope stabilisation methods such as mulching (straw and brushwood), erosion control blankets, geotextiles, soil binders, and gravelling. Implement structural measures such as retaining walls, rock armouring or terracing on high-risk slopes and embankments. Sediment traps and basins to intercept and retain sediment-laden runoff. Removal of bulk earth material, as soon as possible. Schedule inspections after heavy rainfall to assess erosion risks, structural integrity and overall road condition. Ensure no materials are deposited in landslide prone areas during construction to avoid triggering additional instability. After Mission G21, take into consideration new findings of unstable and conditionally stable terrains. Full implementation of the Emergency Preparedness and Response Plan (EPRP). Revegetation in line with the Landscape and Habitat Restoration Plan (LHRP), which will be implemented in conjunction with the Topsoil Management Plan and Waste Management Plan. The LHRP will include measures to enhance the stability of loose materials and exposed surfaces during the construction phase. Additionally, it will cover the recultivation of the spoil disposal site. | <ul style="list-style-type: none"> Contractor | <ul style="list-style-type: none"> Visual inspection of slopes and embankments for erosion signs (e.g. rills, gullies, surface instability) and effectiveness of installed stabilisation measures (mulching, geotextiles, retaining structures), conducted weekly and after heavy rainfall. Visual inspection of functionality of sediment traps and basins, including inspection for clogging, structural damage, and accumulated sediment levels; verify presence of sediment-laden runoff or uncontrolled discharge at all runoff points. Visual verification that no materials are stored or disposed of in landslide-prone or unstable terrain. | <ul style="list-style-type: none"> All stabilised slopes and embankments inspected weekly and after heavy rainfall, with zero unaddressed signs of erosion or structural failure. All sediment traps and basins remain functional throughout construction, with sediment removed before reaching 30% of design capacity and no uncontrolled sediment-laden runoff observed at discharge points. No incidents of material deposition in landslide-prone or unstable areas, verified through inspection records and alignment with updated geotechnical risk mapping. |
| 23) | Construction | Change of land use | <ul style="list-style-type: none"> Limit construction activities to designated areas to minimise unnecessary clearing and soil disturbance. Avoid unnecessary tree felling by selectively clearing only the areas required for construction. Use existing access roads and infrastructure, wherever possible, to reduce the footprint of new construction. | <ul style="list-style-type: none"> Contractor | <ul style="list-style-type: none"> Visual inspection confirms no clearing beyond approved boundaries, and all tree removal is limited to areas explicitly marked in the construction plans. | <ul style="list-style-type: none"> All construction activities confined to designated and demarcated areas. All revegetation and habitat restoration measures implemented in accordance with the |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
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| | | | <ul style="list-style-type: none"> ■ Implement measures from the WMP. ■ Revegetation in line with the LHRP, which will be implemented in conjunction with the Topsoil Management Plan and Waste Management Plan. ■ Ensure habitat restoration in line with compensation measures outlined in Biodiversity and Protected Areas. | | <ul style="list-style-type: none"> ■ Visual inspection of access routes and supporting infrastructure to confirm the use of existing roads and utilities wherever planned ■ Visual confirmation and photographic records of revegetation and habitat restoration progress in line with the LHRP. | <p>LHRP, Topsoil Management Plan, Waste Management Plan and Biodiversity compensation commitments.</p> |
| 24) | Construction | Soil contamination | <ul style="list-style-type: none"> ■ Washing of equipment and vehicles to be done only at special sites designed to avoid soil and groundwater contamination. ■ Washing out of concrete mixer and pumps on site is not allowed. ■ The storage and handling of fuels should be a rigorously controlled process that includes taking measures for prevention of soil contamination. ■ Containers holding chemicals, fuels and oils to be stored in designated areas with suitable tanks and a waterproof surface. ■ Mandatory use of sawdust, sand or other absorbent material in case of accidental leakage of fuel, oil and other chemicals. ■ The machines should be parked at appropriately envisaged and arranged sites (camps) that fulfil the necessary requirements for soil protection (accidental leaks of fuel and oil). ■ Implementation of appropriate waste management, in accordance with the WMP and legal requirements. ■ In case of soil contamination with accidentally spilled fuels, oils, chemicals, the contaminated soil sample should be removed and treated as hazardous waste. ■ Full implementation of the Emergency Preparedness and Response Plan (EPRP). | <ul style="list-style-type: none"> ■ Contractor | <ul style="list-style-type: none"> ■ Regular visual inspections of equipment washing areas, machinery parking sites, fuel/chemical storage zones, and emergency spill locations to confirm compliance with protective infrastructure requirements (e.g. waterproof surfaces, containment bunds, use of absorbents) and absence of visible soil contamination. ■ In case of accidental spills or leaks, immediate visual assessment followed by soil sampling to confirm presence or absence of contamination. ■ The rest of monitoring parameters is the same as under Geology and Groundwater, Surface | <ul style="list-style-type: none"> ■ No visible soil contamination observed at equipment washing areas, fuel/chemical storage zones, or machinery parking sites during regular visual inspections. ■ In case of accidents, 100% of soil contamination incidents from spills are followed by soil sampling, and contaminated soil is removed and treated as hazardous waste. ■ The rest of KPIs are the same as under Geology and Groundwater, Surface Water and Waste and Materials Management. |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|-----------|---|---|---|--|--|
| | | | <ul style="list-style-type: none"> Implement the same measures as under Geology and Groundwater, Surface Water and Waste and Materials Management. | | Water and Waste and Materials Management. | |
| 25) | Operation | Reduction in soil quality in case of direct discharge of surface run-off and accidental fuel and oil spills | <p>In the OESMP include and implement the following measures:</p> <ul style="list-style-type: none"> Maintenance and clean up the drainage system to prevent impact on erosive sliding of the soil or flooding. Regularly inspect and clean roadside drainage systems, culverts and stormwater channels to prevent blockages. Monitoring of slopes, in particular after strong rains for identification of possible traces of erosion. Develop and implement the Emergency Preparedness and Response Plan (EPRP) for the operational phase based on a hazard analysis including the nature, consequence and probability of accidents. The plan shall provide details of procedures, responsibilities, resources, documentation and reporting requirements, training provisions for relevant staff, etc. to avoid spills of hazardous substances and to effectively respond to such incidents. Implement all measures under Surface Water and Waste and Materials Management. | <ul style="list-style-type: none"> PRS for operation Contractor for maintenance | <ul style="list-style-type: none"> Regular visual inspection of roadside drains, culverts, and stormwater channels to confirm they are free from blockages, structurally intact, and functioning properly. Visual monitoring of slopes and embankments, especially after strong rains, to identify early signs of erosion, minor landslides, soil displacement, or toe instability | <ul style="list-style-type: none"> Full implementation of OESMP maintenance measures. |

Air Quality

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|--------------------|--------------|--|---|--|---|--|
| Air Quality | | | | | | |
| 26) | Construction | <ul style="list-style-type: none"> Dust emissions generated from demolition, earthworks and construction activities Exhaust emissions from machinery | <p>Include in the Dust Management Plan (DMP), as a part of CESMP, specific measures for air emissions management:</p> <ul style="list-style-type: none"> Perform regular wetting of exposed soil and unpaved roads during dry weather, near residential areas Cover or dampen material stockpiles and loads Ensure vehicle wheels are cleaned prior to exiting the construction site | <ul style="list-style-type: none"> Contractor(s) to implement and monitor | <ul style="list-style-type: none"> Visual inspection and documentation-based monitoring on implementation of the ESMP measures PM₁₀/PM_{2.5} concentration. Hectares of area disturbed vs hectares of area revegetated. | <ul style="list-style-type: none"> Developed DMP and integrated in CESMP. PM₁₀/PM_{2.5} within legal/local air quality standards. 100% of disturbed area revegetated. No visible dust on the nearby receptors |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|-----------|--------------------------|---|----------------|---|--|
| | | | <ul style="list-style-type: none"> Suspend earthwork operations when wind speeds exceed 20 km/h within 500 m of any community Cover all trucks used for transporting materials to and from the site with canvas tarpaulins Revegetate disturbed areas as soon as possible Ensure proper maintenance of machinery and vehicles to minimise air emissions Repair or remove smoke-emitting vehicles and equipment Use low-sulphur fuels and newer low-emission equipment where possible Minimise engine idling Position stationary emission sources (e.g., portable diesel generators, compressors) as far as practical from sensitive receptors | | <ul style="list-style-type: none"> Number of visible dust episodes. Number of complaints related to dust/emissions. | <ul style="list-style-type: none"> Zero community complaints about dust/emissions 100% compliance with planned maintenance schedule. 100% of fuel used meets low-sulphur fuel criteria. |
| 27) | Operation | - | - | - | - | - |

Climate

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|----------------|--------------|---|--|--|---|--|
| Climate | | | | | | |
| 28) | Construction | <ul style="list-style-type: none"> Environmental pollution caused by GHG emissions from the transportation of construction materials and the operation of construction machinery and vehicles. GHG emissions resulting from the release of stored carbon in soil and biomass caused by vegetation clearing and land-use changes. | <ul style="list-style-type: none"> Minimise GHG emissions from construction equipment by using energy-efficient machinery or alternative fuels (e.g., electric or hybrid vehicles, low-sulphur diesel fuel) and implementing measures outlined in Air Quality chapter below. Limit the area of vegetation clearing to the minimum necessary for construction activities and implement revegetation measures as stipulate under Biodiversity and Protected Areas, as well as Landscape and Visual Setting chapters above. | <ul style="list-style-type: none"> Contractor to implement PIU and Supervision Engineer to monitor | <ul style="list-style-type: none"> Fuel type and source of machinery (diesel, electric, hybrid). Fuel consumption logs per machine. Maintenance logs per machine. Hectares of area of vegetation cleared. Hectars of area revegetated. | <ul style="list-style-type: none"> ≥ 30% of machinery fleet uses low-emission or electric/hybrid technology. 100% of machinery maintained as per schedule. Area cleared does not exceed design specifications. 100% of cleared area revegetated within 3 months post-construction. |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
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| 29) | Design and construction | <ul style="list-style-type: none"> Gaps in existing geotechnical investigations and the potential inadequacy of currently proposed measures may increase the risk of pluvial flooding, landslides, and erosion, leading to road degradation | <p>Before construction, the Designer/Contractor¹⁰ to conduct additional geotechnical investigations in accordance with Eurocode 7. Particular attention should be given to areas identified as landslide-prone in the geotechnical documentation, especially at cut locations.</p> <p>Based on the results of these investigations, the following should be considered:</p> <ul style="list-style-type: none"> Local realignments of the route to reduce cut heights and the associated landslide/erosion risk. Construction of integral bridge solutions instead of typical bridges, given their greater structural redundancy, resilience, and improved durability due to reduced ingress of de-icing salts. In areas where high embankments are currently supported by reinforced concrete walls, the use of bridging structures (e.g., viaducts) or reinforced earth structures, which provide safer and more stable solutions. In addition, all retaining structure calculations should be carried out in accordance with Eurocode standards¹¹, representing current best practice in structural and geotechnical engineering. Design and calculations should account for all relevant effects, including soil-structure interaction, temperature effects, braking forces, wind, and seismic actions. | <ul style="list-style-type: none"> Design developer (or Contractor in case of Yellow FIDIC contract) to implement PRS to include requirements in the Tender Documentation PIU and Supervision Engineer to monitor | <ul style="list-style-type: none"> Geotechnical investigations completed prior to the commencement of construction activities Route realignments, internal bridge solutions, bridging and supporting structures considered in accordance with geotechnical investigation results Soil-structure interaction, temperature effects, braking forces, wind, and seismic actions included in design and calculations | <ul style="list-style-type: none"> 100% of already identified landslide-prone areas and cut locations covered by geotechnical investigations 100% of geotechnical investigations conducted in accordance with Eurocode 7 100% of retaining structure calculations conducted in accordance with Eurocode standards 100% of Project alignment designed in accordance with geotechnical investigations results |
| 30) | Construction | <ul style="list-style-type: none"> During construction, extreme weather events such as heavy rainfall, extreme heat, fires, and snowfall can significantly disrupt activities. Rainfall may cause flooding, landslides, erosion, and access issues, leading to | <p>The Contractor to prepare and implement an Emergency Preparedness and Response Plan as a part of the CESMP. The Plan to include:</p> <ul style="list-style-type: none"> Key national and EU policies, laws, and standards related to emergency response to mitigate climate-related impacts on society and the environment. Identification of climate-related hazards associated with construction activities and their potential impacts on the environment and human health. | <ul style="list-style-type: none"> Contractor to implement PIU and Supervision Engineer to monitor | <ul style="list-style-type: none"> Inspect drainage systems, slopes, and equipment placement to confirm flood-prone areas are avoided or protected. Check for presence and maintenance of fire detection and suppression systems at key | <ul style="list-style-type: none"> Climate-related hazards identified in the CESMP and EPRP. CESMP prepared to include all proposed mitigation measures. ≥ 90% of workers trained in emergency procedures. ≥ 1 emergency drill per quarter. |

¹⁰ According to the Technical Assessment – Final Report (September 2025), the Project is recommended to be implemented under a Yellow FIDIC contract.

¹¹ EN 1990 – Eurocode 0: Basis of Structural Design, EN 1991 – Eurocode 1: Actions on Structures, EN 1992 – Eurocode 2: Design of Concrete Structures, EN 1998 – Eurocode 8: Design of Structures for Earthquake Resistance

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
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| | | <p>delays and safety risks.</p> <ul style="list-style-type: none"> ■ Heat and fires can damage equipment, pose H&S hazards, and reduce air quality. ■ Snow and ice can block access, increase the risk of slips and equipment instability, and affect ground stability, further delaying works and increasing costs. | <ul style="list-style-type: none"> ■ Identification of necessary activities, measures, and equipment to reduce human and environmental impacts from climate-related hazards. ■ Procedures for personnel refuge, evacuation, rescue, and medical treatment. ■ Description of the emergency response organisational structure for both the Contractor and Promoter (PRS). ■ Training arrangements for response teams and testing of emergency systems and procedures. ■ Provisions for training all workers on emergency response procedures and ensuring effective communication during emergencies. ■ Define communication channels in emergency situations. ■ Define the maintenance and control mechanisms for this Plan. ■ Set up early warning systems for workers in extreme weather conditions, allowing activities to be paused or redirected to minimise risk. <p>Additionally, for flood- and landslide-related hazards, the following measures to be included in the CESMP and implemented:</p> <ul style="list-style-type: none"> ■ Implement measures for topsoil removal and for managing potential landslides and erosion occurrence, as defined under <i>Soil and Land Use</i>. ■ Implement measures to eliminate or minimise the risks and hazards associated with earthwork activities, with a focus on earthworks stability, hazard management, and excavation safety, as outlined below under <i>OHS</i>. ■ Ensure that all temporary structures, equipment, and machinery are located in areas that are not prone to flooding or in flood-prone zones with proper drainage systems in place. ■ In case of significant wetting in low-lying areas, install culverts to drain accumulated water. ■ In case of heavy torrential water flow from larger catchment areas, collect and channel water through temporary or permanent channels and pipelines. | | <p>locations; verify enforcement of no-smoking zones; confirm flammable materials are stored safely in heat-resistant containers; and review fire weather warnings and any associated work stoppages.</p> <ul style="list-style-type: none"> ■ Visually inspect the application of de-icing agents on access roads and walkways; confirm that temporary roads are reinforced in freeze-prone areas; and ensure all machinery and vehicles are equipped and maintained for cold weather operation. ■ The rest of monitoring parameters is the same as under <i>Hydrogeology and Groundwater, Surface Water, Soil and Land Use</i>. | <ul style="list-style-type: none"> ■ 100% of early warning systems tested monthly and operational. ■ 100% of drainage systems inspected monthly and functioning. ■ 100% of flood-prone structures protected or relocated. ■ No landslide incidents. ■ Fire suppression equipment fully available and functional. |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|-------|--------------------------|---|----------------|-----------------------|----------------------------------|
| | | | <ul style="list-style-type: none"> ■ Conduct periodic geotechnical monitoring for landslide control. ■ In case of landslides or erosion, mark affected areas and set up appropriate traffic signals. <p>For wildfire-related hazards, the following measures also to be included in the CESMP and implemented:</p> <ul style="list-style-type: none"> ■ Establish an effective fire detection and suppression system on-site, including fire extinguishers and sprinklers, particularly in areas where flammable materials and hazardous substances are stored. ■ Prohibit smoking and other fire-causing activities in high-risk areas (e.g., near forests) during summer months, with clearly marked no-smoking zones. ■ Regularly monitor fire risk conditions in the Project area through visual inspections and news updates, including monitoring forest fire danger indices on the Republic Hydrometeorological Institute’s website. ■ Store flammable materials in heat-resistant containers. ■ Suspend work in case of significant fire risk. ■ Implement equipment maintenance activities as specified in the Maintenance Plan, outlined below in the OHS chapter. <p>For snow- and ice-related hazards, the following measures to be also included in the CESMP and implemented:</p> <ul style="list-style-type: none"> ■ Apply salt or other appropriate de-icing agents (e.g., calcium-magnesium acetate, magnesium chloride, sand) on construction roads, access points, and pedestrian walkways to prevent ice buildup and improve traction. ■ Reinforce temporary access roads in areas prone to freezing to ensure stability and navigability during winter conditions. This may include additional layers of gravel or geotextile material. ■ Ensure that all machinery, vehicles, and equipment are properly equipped to handle cold temperatures, including antifreeze in engines, | | | |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
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| | | | battery checks, and ensuring proper function of hydraulic systems in freezing conditions. <ul style="list-style-type: none"> ■ Implement equipment maintenance activities as specified in the Maintenance Plan, outlined below in the OHS chapter. | | | |
| 31) | Operation | <ul style="list-style-type: none"> ■ Extreme weather events such as heavy rainfall, heatwaves, wildfires, and snowfall can significantly affect road infrastructure and safety. ■ Flooding and landslides may damage roads, embankments, and drainage systems, leading to blockages, traffic disruptions, and increased maintenance costs. ■ Heat and wildfires can weaken asphalt and reduce visibility, posing safety risks. ■ Snow and ice can damage infrastructure, obstruct lanes, reduce visibility, and increase the likelihood of traffic accidents. | <p>In addition to the measures already included in the Project design to reduce the Project's vulnerability to landslides and erosion, PRS also to implement the following measures as a part of the OESMP:</p> <ul style="list-style-type: none"> ■ Regular maintenance and inspection of drainage systems to ensure that culverts, drains and channels are free from blockages and functioning properly to prevent water accumulation on the road surface. ■ In case of noticeable torrential water flow from larger catchment areas, collect and channel water through temporary or permanent channels and pipelines. ■ In case of noticeable landslides or erosion, mark the affected terrain and set up appropriate traffic signals. Undertake measures to protect against and rehabilitate landslides and erosion as soon as possible, for example: through rapid intervention and remediation in case of landslide occurrence (e.g. landslide removal, soil stabilisation), construction of additional retaining walls in consultation with technical experts, replacement or restoration of vegetation cover on damaged areas, and installation of reinforced earth structures or geosynthetics to stabilise slopes. ■ Conduct periodic visual monitoring for landslide control. <p>For wildfire-related hazards, PRS to include the following measures in the OESMP:</p> <ul style="list-style-type: none"> ■ Restrict the movement of vehicles transporting dangerous substances during periods of high temperatures. ■ Regularly monitor fire risk conditions in the Project area through visual inspections and news updates, including monitoring forest fire danger indices on the Republic Hydrometeorological Institute's website. | <ul style="list-style-type: none"> ■ PRS to implement and monitor | <ul style="list-style-type: none"> ■ Visual inspection logs for culverts, drains, and channels. ■ Visual monitoring records of slope and embankment stability. ■ Field checks to verify the presence and condition of stabilisation measures (e.g. retaining walls, geosynthetics, vegetation cover) on rehabilitated slopes ■ Verification of snow and ice removal activities on roads and drainage infrastructure before, during, and after snow events. ■ Same as defined under Hydrogeology and Groundwater, Surface Water, Soil and Lan Use. | <ul style="list-style-type: none"> ■ OESMP and Fire Protection Plan available and implemented. ■ Emergency Preparedness and Response Plan updated for operational phase. ■ All relevant personnel trained on updated Emergency Preparedness and Response Plan. ■ No climate-related infrastructure damage or traffic disruptions events per year. |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|-------|--------------------------|---|----------------|-----------------------|----------------------------------|
| | | | <ul style="list-style-type: none"> ■ Avoid planting resinous trees along the road section. ■ Maintain proper vegetation clearance along the road route and a minimum clearance zone from the edge of the roadway in accordance with local forestry regulations, particularly in areas prone to wildfires during hot and dry conditions. <p>PRS to develop a Fire Protection Plan for the new infrastructure, as specified below under <i>OHS</i>.</p> <p>For snow- and ice-related hazards, PRS to include in the OESMP the following measures:</p> <ul style="list-style-type: none"> ■ Regularly clear snow and ice from the road surface, pavements, and drainage systems to maintain safe driving conditions. ■ Conduct regular inspections of pavements, and drainage systems before, during, and after snow/ice events to assess any damage or accumulation that could pose a hazard to motorists. ■ Apply de-icing agents (e.g., calcium-magnesium acetate, magnesium chloride, sand) to the road surface before and after snow events to prevent ice formation and improve traction. ■ Implement reduced speed limits and temporary road closures during extreme snow/ice conditions to reduce the risk of accidents and improve safety. <p>PRS to revise the existing Emergency Preparedness and Response Plan to address new risks associated with climate-related hazards along the Project route.</p> | | | |

Noise and Vibrations

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----------------------------|--------------|--|--|--|---|---|
| Noise and Vibrations | | | | | | |
| 32) | Construction | <ul style="list-style-type: none"> ■ Noise emissions during the construction phase are generated by | Prepare Construction Noise Management Plan (CNMP), as a part of CESMP, which shall include the following measures: | <ul style="list-style-type: none"> ■ Contractor(s) to implement and monitor | <ul style="list-style-type: none"> ■ Visual inspection and documentation-based monitoring on | <ul style="list-style-type: none"> ■ Approved CNMP as a part of CESMP includes noise and vibration mitigation. |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|-------|---|---|----------------|--|--|
| | | <p>the operation of construction tools, equipment, or machinery related to earthworks, groundwork, structural and equipment installation, and heavy vehicle traffic, including construction machinery and transport vehicles.</p> <ul style="list-style-type: none"> ■ Structural damage from vibration caused by equipment and operation methods employed | <ul style="list-style-type: none"> ■ Restrict construction activities to 06:00–22:00 on weekdays, avoiding nighttime work, weekends, and public holidays to minimise disturbance to nearby residents and rural communities. ■ Schedule high-noise activities (e.g., blasting, piling, rock breaking) during mid-day periods, when ambient noise levels are higher and residents are less likely to be at home. ■ Avoid simultaneous operation of multiple high-noise machines wherever possible to reduce cumulative noise impacts. ■ If noisy activities must be performed at night or extended over multiple nights near sensitive receptors, temporary noise barriers (e.g., mobile acoustic screens) shall be installed around the work area. ■ Inform the local population in advance about periods of particularly high noise, especially when working near residential areas or tourist zones. ■ Restrict vehicle speeds on internal and external access roads to reduce rolling noise and engine revving. ■ Maintain construction site and access roads in good condition (e.g., filling potholes, smoothing surfaces) to prevent noise from vibrations and mechanical impacts. ■ Prioritise the use of modern, low-noise machinery that complies with EU Directive 2000/14/EC on noise emissions from outdoor equipment. ■ Equip noisy machinery (e.g., compressors, generators, excavators) with mufflers, silencers, or acoustic enclosures. ■ Shut down or throttle down machinery when not in use, instead of letting it idle unnecessarily. ■ Perform regular maintenance to ensure all machinery operates efficiently, preventing noise from loose parts, worn components, or faulty engines. ■ Provide hearing protection (e.g., earmuffs or earplugs) to all workers operating or working near loud equipment. ■ Rotate workers or limit their exposure time near high-noise sources such as pile drivers, rock | | <p>implementation of the ESMP measures</p> <ul style="list-style-type: none"> ■ Noise and vibration monitoring as per the Monitoring Plan (Appendix J2) | <ul style="list-style-type: none"> ■ 100% of high-noise activities scheduled per CNMP as a part of CESMP. ■ Noise levels comply with local limits at receptors. ■ No noise complaints with regulatory exceedance. ■ 100% of vibration complaints evaluated within 5 working days. ■ 100% of workers near high-noise equipment provided with personal protection equipment. ■ 100% of relevant machinery fitted with silencers or acoustic enclosures. ■ 100% of construction equipment maintained on schedule. ■ No piling works <30 m from residential areas unless low/no-vibration methods are used. |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
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| | | | <p>crushers, or jackhammers to reduce the risk of hearing damage.</p> <ul style="list-style-type: none"> ■ Conduct noise monitoring in the closest residential areas if complaints are received from local residents. Monitoring will be used to confirm whether noise levels exceed applicable regulatory standards. ■ Based on monitoring results, additional mitigation (e.g., work rescheduling, increased shielding, or equipment changes) will be implemented if required. ■ Appoint a responsible person for noise management on the construction site, who will coordinate measures, communicate with contractors and respond to complaints. ■ Comply with the noise mitigation measures and monitoring requirements as stipulated in the Ecological (Environmental) Permit. ■ Impacts from piling works should be avoided in zones where residential buildings are located at a distance less than 30 m. As an alternative option, low or non-vibratory piling methods can be employed to minimise potential disturbances. ■ Maintaining the access roads and/or construction site in good condition to minimise vibration generation. <p>Vibration monitoring at the closest residential areas will be evaluated only in case of complaints from local residents due to Project construction activities, in order to verify the actual potential exceedances of applicable limits/standards.</p> | | | |
| 33) | Operation | Noise emissions during the operational phase will result from continuous traffic flow, including heavy vehicles. Although predicted noise levels (L_{den}) for 2057 remain within regulatory limits, two residential buildings located 7 and 9 meters from the road may experience elevated noise due to their | <p>Include in the OESMP specific measures for noise management:</p> <ul style="list-style-type: none"> ■ Upon complaints by concerned citizens and following measurements of external and internal noise levels, passive noise protection measures will be implemented, including replacing doors, windows, and façade elements with soundproof materials where needed. ■ Joinery or façade upgrades will only be carried out if existing elements do not meet the required acoustic insulation standards. ■ Indoor noise levels must not exceed 65 dB(A) during the day and evening, and 50 dB(A) at night, | <ul style="list-style-type: none"> ■ PRS to implement and monitor | <ul style="list-style-type: none"> ■ OESMP prepared and implemented by PRS. ■ Noise measurements conducted at potentially affected buildings upon complaint. ■ Passive noise protection installed if acoustic non- | <ul style="list-style-type: none"> ■ All identified buildings with confirmed noise exceedances have been addressed and measurements completed. ■ 100% of buildings with confirmed noise exceedances have received passive noise protection measures, such as façade and joinery upgrades. |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
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| | | proximity. Given modelling uncertainties, there is a potential risk of reduced indoor acoustic comfort without mitigation. | with windows and doors closed, in line with the project's noise levels standards. | | compliance is confirmed. | |

Waste and Materials Management

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
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| Waste and Materials Management | | | | | | |
| 34) | Construction | Generation of different types of waste | <p>The Waste Management Plan (WMP) has already been prepared and must be fully implemented by the Contractor. In addition, the Construction Waste Management Plan (CWMP) is to be developed and implemented as part of the Contractor's obligations. These Plans should cover strategies for segregating, storing and transferring waste management responsibilities to licensed operators, effectively preventing inappropriate disposal of all waste types in the construction area. The WMP and CWMP should be part of CESMP, and outline specific measures, including:</p> <ul style="list-style-type: none"> ■ All waste generated during construction activities must be classified and separated as inert, non-hazardous or hazardous waste, electrical and electronic waste. Mixing these categories is strictly prohibited. ■ Proper storage of both hazardous and non-hazardous waste involves using designated and labelled containers to segregate waste, preventing spills and leaks and storage in areas away from the lake to minimise potential risks. Waste to be stored temporary on site neatly and safely. ■ The final disposal of (hazardous) waste to be conducted by engagement of authorised third parties, in compliance with the national requirements on transfer, treatment and disposal of waste, and accompanied with appropriate documentation. Licenced operators and companies specialised in handling hazardous and non-hazardous waste must be engaged. | <ul style="list-style-type: none"> ■ Contractor | <ul style="list-style-type: none"> ■ Presence and visibility of labelled containers for segregated waste (inert, non-hazardous, hazardous, electronic)- ■ Records of waste quantities by type and disposal method. ■ Contracts and licenses of authorised third-party waste handlers. ■ Logs of temporary waste storage conditions (location, safety, duration). ■ Evidence of implementation of CWMP and WMP. ■ Frequency of site inspections related to waste segregation and storage. ■ Records of training provided to site | <ul style="list-style-type: none"> ■ 100% of waste stored in designated, labelled containers. ■ Zero incidents of mixed waste disposal or unapproved dumping on-site. ■ All hazardous waste handled and removed by licensed operators. ■ Full implementation of WMP and CWMP measures on-site. ■ No environmental non-compliance findings in waste-related inspections. ■ 90%+ of excavated material reused on-site (if technically feasible). |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|--------------|-----------------------------|---|--|---|--|
| | | | <ul style="list-style-type: none"> ■ Non-hazardous municipal type of waste is to be collected by the Public Utility Company "Komunalac", Foca, and disposed in accordance with local waste disposal regulations. ■ Most of the suitable excavated materials that will be generated to be reused as engineering fill material and/or for levelling the terrain and access roads. The use of excavated material is only possible if it is confirmed that it does not contain pollutants in quantities that could endanger the environment. ■ It is forbidden to burn or bury waste on the construction site. ■ It is forbidden to dispose waste in an uncontrolled manner on land. ■ Educate employees about the types of wastes generated and their handling procedures. | | <p>personnel on waste handling.</p> | |
| 35) | Construction | Selection of disposal sites | <p>The following are the necessary mitigation measures to undertake in order to minimise the negative impacts from spoil disposal sites:</p> <ul style="list-style-type: none"> ■ Excavated material that will not be used in construction activities must be deposited outside the streams in the water catchment area of the River Drina. ■ After the formation of the disposal areas, it is necessary to carry out humification in a layer of 20 cm. To carry out this process, the humus that has been removed from the site will be utilised together with fresh humus, if needed. ■ Peripheral ditches shall be constructed along the perimeter of the disposal sites to collect rainwater from external sources and the closed section of the sites, directing it towards the nearest recipient. On the opposite side, the planned ditch runs alongside the sites and connects to the existing road's drainage ditch, leading to the recipient. In areas where the ditch's slope exceeds 4%, concrete elements must be used to line the ditch. Specific studies shall be undertaken to ensure geotechnical stability and integration within the surrounding environment. ■ Implement measures from under Biodiversity and Protected Areas, Tourism and Recreation and Community Health and Safety. | <ul style="list-style-type: none"> ■ Contractor | <ul style="list-style-type: none"> ■ Location of disposal sites relative to streams and water catchment areas. ■ Confirmation that humification layer is applied as specified (minimum 20 cm). ■ Presence and condition of peripheral and connecting ditches. ■ Slope gradient checks for ditch lining (e.g. >4% requires concrete lining). ■ Documentation of geotechnical stability assessments. ■ Integration and compatibility with surrounding land use ■ The rest of monitoring parameters is the | <ul style="list-style-type: none"> ■ 100% of disposal sites located outside sensitive water catchment zones. ■ All formed sites humified to the required 20 cm layer using appropriate humus. ■ Fully constructed and functional ditch system around disposal sites. ■ All sites with slope >4% lined with appropriate material. ■ Completion of geotechnical and environmental studies for each disposal location. ■ No reports of runoff-related contamination or instability at disposal areas. ■ The rest of KPIs are the same as under Biodiversity and |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|--------------|--|--|--|--|---|
| | | | | | same as under Biodiversity and Protected Areas, Tourism and Recreation and Community Health and Safety. | Protected Areas, Tourism and Recreation and Community Health and Safety. |
| 36) | Construction | Procurement of materials on the market | <ul style="list-style-type: none"> ■ If Contractor decides to purchase construction materials from the market, it is allowed to subcontract only licensed material providers that have valid Environmental, Water and Working Permits. <ul style="list-style-type: none"> - A Materials Management Plan (MMP) shall be developed by the appointed Contractor and will include details on how the site construction materials would be managed. The MMP shall include planning and controlling of all materials and equipment in advance, procuring them at a reasonable cost, storing them adequately and making them available as needed. The MMP shall be based on best practices and all the requirements of this Report, such as: integration of resource efficiency measures for the management of excavated spoil materials into the yellow FIDIC Tender Documents, aiming for at least 30% material savings compared to conventional sourcing. This target is subject to confirmation through updated geotechnical assessments following the completion of the G21 Mission during the Main Design development phase, - capturing Project requirements early in the process, including a written scope of requirements that identifies deliverables, equipment and materials needed, - evaluating proposals from suppliers or vendors based on their performances on past and present projects, - adequate storage planning where each material requisition is planned with a level of storage and preservation based on the equipment type and manufacturers' preservation requirements. Specific storage | <ul style="list-style-type: none"> ■ Contractor | <ul style="list-style-type: none"> ■ Valid Environmental, Water and Working Permits of material suppliers. ■ Availability and implementation of the MMP. ■ Documentation of material sourcing, storage and usage procedures. ■ Logs of material delivery, handling, and storage, including hazardous materials. ■ On-site quality control checks. | <ul style="list-style-type: none"> ■ 100% of materials sourced from licensed and permitted suppliers. ■ ≥30% of material savings achieved compared to conventional sourcing. ■ Number of non-compliances related to unlicensed suppliers or improper storage. ■ Frequency of MMP updates and audits conducted during construction phase. ■ No incidents related to material mismanagement. |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|-----------|--|--|---|---|--|
| | | | <p>measures should be planned for chemicals/hazardous materials,</p> <ul style="list-style-type: none"> - materials on-site quality assurance and quality control, - keeping the records of: (i) licenses and permits of suppliers or vendors, (ii) material resources tracking, treatment, disposal, and delivery notes records, and (iii) records of any contingency arrangement for material resources and waste arisings that had to be implemented will also be detailed. | | | |
| 37) | Operation | Generation of different types of waste | <ul style="list-style-type: none"> ■ An overarching Waste Management Plan for Project's operation phase to be updated to include identification of all waste types and quantities and set up the principles for implementation of waste management activities by the PRS and any sub-contractors engaged on operation and maintenance activities. ■ During the operation of the road, waste will be transferred to licenced operators for waste management for final treatment and/or disposal. ■ Develop and implement the Emergency Preparedness and Response Plan (EPRP) based on a hazard analysis including the nature, consequence and probability of accidents. The plan shall provide details of procedures, responsibilities, resources, documentation and reporting requirements, training provisions for relevant staff, etc. to avoid spills of hazardous substances and to effectively respond to such incidents. ■ During the road maintenance activities, the Contractors shall apply the same measures as under the construction phase, as applicable. | <ul style="list-style-type: none"> ■ PRS for operation ■ Contractor for maintenance | <ul style="list-style-type: none"> ■ Presence and implementation of the Internal Procedure for Waste Management. ■ Records of waste quantities and types generated during operation. ■ Contracts with licenced waste operators for treatment and disposal. ■ Documentation of emergency response training and resources. ■ Evidence of EPRP implementation. ■ Frequency of internal audits related to operational waste management. | <ul style="list-style-type: none"> ■ 100% of operational waste handled by licenced operators. ■ No unregistered or illegal waste disposal incidents. ■ Internal Waste Management Procedure developed and implemented by the PRS. ■ EPRP fully developed and tested. ■ Quarterly reporting on waste quantities and compliance status. ■ All operational staff trained on waste management and spill response. |

Landscape and Visual Setting

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|------------------------------|-------|--------------------------|-----------------------|----------------|-----------------------|----------------------------------|
| Landscape and Visual Setting | | | | | | |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|--------------|--|---|--|---|---|
| 38) | Construction | <ul style="list-style-type: none"> ■ Clearance of vegetation and disruption of forest, ■ Landform modifications due to cuttings and embankments ■ Removal of existing structures ■ Temporary land use changes due to construction compounds and machinery ■ Light pollution | <ul style="list-style-type: none"> ■ Mitigation measures defined for erosion prevention Hydrogeology and Groundwater and Surface Water. ■ Integrate vegetated slopes instead of concrete walls where possible, on the riverbank slopes. ■ Limit clearance to only essential areas for the bridge and access roads. ■ Install temporary opaque fencing around construction compounds and active work zones to screen views of machinery, demolition, etc. ■ Use directional, low-intensity lighting with shielding. ■ Restrict night-time construction activities near residential areas to essential operations only. ■ Coordinate construction activities with rafting camps through direct engagement and regular communication, including advance notice of construction schedules, potential access restrictions and expected disturbances. Establish a clear point of contact between the contractor and camp operators to allow for timely information sharing and coordination. | <ul style="list-style-type: none"> ■ Contractor(s) to implement and monitor | <ul style="list-style-type: none"> ■ N/A | <ul style="list-style-type: none"> ■ No incidents of spoil and soil erosion in sloped areas ■ Construction zones have fencing installed within 5 days of activity start |
| 39) | Operation | <ul style="list-style-type: none"> ■ Introduction of permanent infrastructure elements ■ Increased traffic and dynamic visual elements ■ Lighting and night-time visibility | <ul style="list-style-type: none"> ■ Implement a Landscape Habitat Restoration Plan (LHRP) immediately after works to stabilise soil and reintegrate the site into its natural context. ■ Replant native species on cleared or disturbed ground. ■ Monitor the site after construction to ensure vegetation is recovering ■ In consultation with local communities, plant native evergreen species near residential areas ■ Rehabilitate embankments and cuttings with native vegetation to visually blend engineered slopes with the natural landscape. ■ Reforest spoil disposal sites with autochthonous plant species to promote habitat restoration and visual integration ■ Apply natural stone textures or earth-toned finishes to visible embankment surfaces to blend with surrounding terrain. ■ Plant native tree and shrub species along the edges of the viaduct columns and embankments, and near campsites and public spaces to soften its appearance. | <ul style="list-style-type: none"> ■ PRS to implement and monitor | <ul style="list-style-type: none"> ■ Parameters defined in Biodiversity section related to survival of planted vegetation and habitat fragmentation. | <ul style="list-style-type: none"> ■ Landscape Habitat Restoration Plan prepared and implemented by the PRS ■ KPIs defined in Biodiversity section related to survival of planted vegetation and habitat fragmentation. |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
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| | | | <ul style="list-style-type: none"> Informing camps managements about planned works and their implementation time Enabling complaints to be submitted through the stakeholder communication system. | | | |

Cultural Heritage

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|--------------------------|--------------|--|--|----------------|-----------------------|---|
| Cultural Heritage | | | | | | |
| 40) | Construction | Temporary noise, vibration, dust and access disruptions near the Hum-Bastasi Mosque during bridge construction | <ul style="list-style-type: none"> Maintain open communication with mosque representatives and Vakuf Office; notify them in advance of planned works Schedule high-noise activities outside of major religious dates (e.g., Eid, Mevlud) Implement standard noise, dust and vibration control measures Ensure uninterrupted access during construction – any temporary disruption of current access is only possible if alternative access will be ensured in advance and communicated upfront and in timely manner Coordinate traffic and machinery movement outside peak mosque hours Prepare a Chance Find Procedure and provide appropriate training to workers. | Contractor | N/A | <ul style="list-style-type: none"> Construction schedule aligned with religious calendar All control measures implemented Access routes to mosque maintained during works No disruption to mosque access during construction Chance Find Procedure developed All machinery movement coordinated outside peak mosque hours |

Community Health and Safety

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|------------------------------------|--------|---|---|------------------|-----------------------|---|
| Community Health and Safety | | | | | | |
| 41) | Design | Proximity of proposed spoil disposal sites 02, 03A, 03B, 05A, 05B, 05C and 06 to houses and rafting camps | <ul style="list-style-type: none"> Relocate spoil disposal sites 02, 03A, 03B, 05A, 05B, 05C and 06 in consultation with Municipality of Foca Locations cannot be in avoidance zones as defined by the ESMMP and BMP, within EAAA of CHs as mapped in CHA, or located in proclaimed protected areas, candidate Emerald sites or potential Natura 2000 sites | Design developer | N/A | <ul style="list-style-type: none"> Updated layout with disposal sites either relocated or removed. No justified complaints from communities |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|--------------|---|--|---|---|--|
| 42) | Construction | Temporary noise, vibrations, and dust affecting nearby residents and businesses | <ul style="list-style-type: none"> Implement noise, vibration and dust management measures as detailed in the corresponding ESMP fields | <ul style="list-style-type: none"> Contractor | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> Compliance with legal limits No justified complaints from communities |
| 43) | Construction | Temporary access disruptions; traffic and road safety risks | <ul style="list-style-type: none"> Develop and implement a Traffic Management Plan (TMP). Maintain alternative access routes where needed. Ensure timely communication with residents. Enforce safe driving practices for construction vehicles. Install temporary signage and barriers. assign traffic marshals at critical points. | <ul style="list-style-type: none"> Contractor / Supervision Engineer | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> TMP in place No major traffic incidents Residents kept informed |
| 44) | Operation | Increased noise levels due to higher traffic volumes | <ul style="list-style-type: none"> Implement noise reduction measures as defined in points under <i>Noise and Vibrations</i>. | <ul style="list-style-type: none"> PRS | <ul style="list-style-type: none"> See above under <i>Noise</i>. | <ul style="list-style-type: none"> See above under noise |
| 45) | Operation | Increase in the risk of wildlife–vehicle collisions | <ul style="list-style-type: none"> Establish a formal communication channel between PRS and the Hunting Association “Bakic” to discuss wildlife activity, potential risk areas and mitigation needs. Consult the Association when determining the placement of wildlife signage and other traffic calming or awareness measures. | <ul style="list-style-type: none"> PRS | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> Communication in place Documented feedback from Hunting Association Wildlife safety signage installed at identified hotspots Meeting records Installed signage Wildlife collision records |

Occupational Health and Safety

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|---------------------------------------|--------|---|---|--|---|--|
| Occupational Health and Safety | | | | | | |
| 46) | Design | Risks of regulatory non-compliance, structural failures, and workplace accidents due to inadequate design | <ul style="list-style-type: none"> Ensure the Main Design includes structural stability and safety provisions Prepare OHS Study and Fire Safety Plan Submit for independent third-party review | <ul style="list-style-type: none"> Design developer | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> Final design approved with safety measures incorporated. OHS Study and Fire Safety Plan developed |

Environmental and Social Assessment Report – Environmental and Social Monitoring and Management Plan

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|--------------|---|---|--|---|---|
| | | | <ul style="list-style-type: none"> ■ Incorporate reviewer comments into final design documents | | | <ul style="list-style-type: none"> ■ Compliance with national requirements, EBRD PRs and WB ESSs. |
| 47) | Construction | Risks from general OHS hazards including: <ul style="list-style-type: none"> ■ work at heights, ■ slips and falls, ■ moving machinery, ■ struck by objects, ■ dust, noise (bulldozers, graders, excavators, etc.), ■ manual handling, ■ vibration, ■ hazardous chemicals, ■ confined spaces, ■ electrocution, ■ trench collapses, ■ traffic hazards, ■ fatigue, ■ fire/explosion, ■ ergonomic injuries | <ul style="list-style-type: none"> ■ The Contractor to develop the Construction Site Organisation Study ensuring proper planning of site layout and safety measures, submit the Study to the competent ministry prior to the commencement of works. The Contractor to also develop and implement the following: <ul style="list-style-type: none"> ■ OHS Management Plan including but not limited to: <ul style="list-style-type: none"> - definition of clear roles and responsibilities for OHS management, - requirements for resources, - personal protective equipment (PPE), - OHS training and awareness programs (multilingual with interpreters where necessary – in case foreign workers are engaged), - multilingual safety signage and awareness material, - requirements for OHS supervisors, - communication of safety protocols to all workers including subcontractors, - safety audits, - improvement of practices based on audit findings, - continuous improvement of practices based on audit findings, - disciplinary procedures for violations of OHS protocols, - safe work procedures for high-risk tasks (deep excavations, work at height, heavy machinery operation, etc.), - safety signage, - mandatory onboarding OHS training for all site-based workers and visitors ■ Emergency Preparedness and Response Plan (EPRP) ■ Traffic Management Plan: <ul style="list-style-type: none"> - defensive driving, | <ul style="list-style-type: none"> ■ Contractor | <ul style="list-style-type: none"> ■ N/A | <ul style="list-style-type: none"> ■ Construction Site Organisation Study approved prior to works start ■ OHS Management Plan and EPRP developed ■ Traffic Management Plan reports ■ Zero major OHS incidents ■ All plans implemented and regularly updated ■ Worker training completed by all workers involved |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|--------------|--|--|--|---|---|
| | | | <ul style="list-style-type: none"> - road safety protocols, - traffic signage, - pedestrian pathways, - debris barriers. ■ Maintenance Plan: <ul style="list-style-type: none"> - regular inspections of work and safety equipment, - record of tools and equipment that is subject of third-party inspection and test, - plan for preventive maintenance of critical equipment, roles and responsibilities for inspection deadline tracking. | | | |
| 48) | Construction | Risks associated with specific OHS hazards related to earthworks: <ul style="list-style-type: none"> ■ rockfalls, landslides, collapses of excavation walls and fills, ■ noise and vibration from blasting or rock excavation, ■ flying debris during rock cutting or blasting, ■ work at heights on steep slopes, ■ hazards from moving heavy machinery on sloping or unstable ground, ■ chemical exposure from explosives or soil stabilizers, ■ reduced visibility due to dust or adverse weather, ■ flooding or water ingress in cuts during heavy rain. | To eliminate or minimise the risks and hazards associated with earthwork activities, the Contractor is required to implement the following: <ul style="list-style-type: none"> ■ Earthworks stability and hazard management: <ul style="list-style-type: none"> - conduct geotechnical assessments to identify and address unstable ground conditions, including slope stability analyses - implement appropriate excavation methods (e.g. benching, shoring, or bracing) to prevent collapses - use controlled blasting techniques with designated safety zones to minimise risks from flying debris - implement protocols for safe movement and operation of heavy machinery on sloping or unstable terrain ■ Excavation safety: <ul style="list-style-type: none"> - develop and enforce clear guidelines for working at heights on steep slopes, including the use of fall protection systems (e.g., harnesses, lifelines) - provide workers with secure and stable access and egress routes to and from excavation sites, ensuring compliance with relevant safety standards - establish flood protection measures for cuts, including temporary drainage channels and barriers to manage water flow during heavy rain ■ Hazardous material management: <ul style="list-style-type: none"> - ensure the safe storage, handling, and use of explosives and soil stabilizers, following | <ul style="list-style-type: none"> ■ Contractor | <ul style="list-style-type: none"> ■ N/A | <ul style="list-style-type: none"> ■ No major incidents from excavation ■ All workers completed safety training ■ Full PPE availability ■ Safety procedures implemented and monitored |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|--------------|---|---|--|---|--|
| | | | <p>manufacturer recommendations and regulatory standards train workers in the proper use of chemicals and PPE</p> | | | |
| 49) | Construction | <p>Risks associated with specific OHS related to the construction of bridges:</p> <ul style="list-style-type: none"> ■ collapse of excavation walls during well excavation, ■ ground instability or water ingress at pillar sites, ■ scaffolding failure or instability during base section construction, ■ crane or lifting equipment accidents during pillar and span assembly, ■ structural instability during free cantilever construction, ■ falling materials or equipment from elevated construction areas, ■ misalignment or failure of temporary supports for connecting segments, ■ hazards from working near or over water (if applicable to the bridges), ■ instability of formwork during concreting, | <p>To eliminate or minimise the risks and hazards associated with bridge construction activities, the Contractor is required to implement the following measures:</p> <ul style="list-style-type: none"> ■ Structural and equipment stability plan: <ul style="list-style-type: none"> - conduct detailed geotechnical surveys to assess ground conditions at pillar sites and implement stabilization measures where necessary, - design and inspect scaffolding, formwork, and cantilever equipment regularly to ensure stability and compliance with load-bearing requirements, - develop and enforce protocols for safe operation of cranes and lifting equipment, - install guardrails, safety nets, and personal fall arrest systems for all elevated work areas, - train workers on safe practices for working at heights, including proper use of PPE and fall protection equipment. ■ Heavy machinery and equipment safety: <ul style="list-style-type: none"> - implement strict access controls and safety zones around moving equipment, particularly cranes and machinery operating near incomplete bridge sections - regularly inspect and maintain machinery to prevent mechanical failure and ensure operational safety. | <ul style="list-style-type: none"> ■ Contractor | <ul style="list-style-type: none"> ■ N/A | <ul style="list-style-type: none"> ■ All scaffolding and formwork inspected before use ■ Zero major incidents involving lifting equipment ■ 100% PPE availability and use ■ Equipment inspection and maintenance performed per schedule ■ High-risk areas clearly demarcated and controlled |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|--------------|---|---|--|---|---|
| | | <ul style="list-style-type: none"> ■ confined space hazards during pillar or abutment construction, ■ fatigue and ergonomic strain from repetitive tasks in elevated or awkward positions, ■ hazards from using heavy machinery near incomplete bridge sections, ■ fire or chemical exposure risks during welding or material handling. | | | | |
| 50) | Construction | <p>Risks associated with environmental conditions specific to the Project area:</p> <ul style="list-style-type: none"> ■ extreme temperatures, ■ high winds, ■ extreme precipitation, ■ lightning, ■ presence of venomous wildlife. | <p>To eliminate or minimise risks and hazards associated with the environmental conditions specific to the Project area, the Contractor must:</p> <ul style="list-style-type: none"> ■ Establish a weather monitoring system ■ Ensure sufficient supplies of antivenom are available at local healthcare institution (or, if applicable, on the construction site/camp) | <ul style="list-style-type: none"> ■ Contractor | <ul style="list-style-type: none"> ■ N/A | <ul style="list-style-type: none"> ■ Work suspended during hazardous weather ■ Availability of antivenom at designated locations |
| 51) | Operation | <p>Health and safety risks due to OHS hazards related to the operation and maintenance phase:</p> <ul style="list-style-type: none"> ■ work at heights, ■ slips and falls, ■ exposure to hazardous gases (e.g., carbon monoxide, nitrogen dioxide), ■ poor visibility in low-light conditions, | <p>To eliminate or minimise risks and hazards associated with the operation, PRS must implement the following measures:</p> <ul style="list-style-type: none"> ■ Update existing Plans and Assessments to reflect newly induced risks, and/or prepare new documents where needed ■ Update PRS's existing OHS Plan for the operation phase to incorporate newly identified risks if applicable ■ Update existing or develop a new Fire Protection Plan for the new infrastructure, including but not limited to: <ul style="list-style-type: none"> - roles and responsibilities in case of fire - safe practices for reducing the possibility of fire, including proper storage and handling of | <ul style="list-style-type: none"> ■ PRS | <ul style="list-style-type: none"> ■ N/A | <ul style="list-style-type: none"> ■ All relevant documents updated and implemented ■ All staff trained on new risks ■ Fire protection measures in place and inspected regularly |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|-------|---|---|----------------|-----------------------|----------------------------------|
| | | <ul style="list-style-type: none"> ■ risks from working at heights (e.g., on bridges or retaining walls), ■ slips, trips and falls in maintenance areas, ■ traffic-related hazards (working near live traffic), ■ manual handling and lifting during maintenance tasks, ■ machinery accidents during maintenance operations, ■ exposure to chemical substances (e.g. fuel, lubricants, paints, de-icing agents), ■ noise exposure from maintenance activities, ■ fire and explosion risks from equipment malfunction. | <ul style="list-style-type: none"> - flammable materials, regular inspection and maintenance of electrical systems, etc. - firefighting equipment and regular inspections - employee training and testing ■ Update the existing Emergency Preparedness and Response Plan to adequately address risks associated with the new infrastructure ■ Update the Job Risk Assessment to reflect changes and newly introduced hazards | | | |

Labour and Working Conditions

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|--------------------------------------|--------------|--|--|--|---|---|
| Labour and Working Conditions | | | | | | |
| 52) | Construction | Potential risks of non-implementation of labour regulations by Contractors and sub-contractors (e.g., undeclared work, excessive working | <ul style="list-style-type: none"> ■ Require from Contractors and sub-contractors, as part of the tendering procedure, to submit a statement confirming their commitment to full compliance with the RS Labour Law, EBRD PR2 and WB ESS2 requirements throughout this phase, including compliance with the Project's LMP. | <ul style="list-style-type: none"> ■ Contractor | <ul style="list-style-type: none"> ■ N/A | <ul style="list-style-type: none"> ■ Signed labour compliance statements from Contractors and sub-contractors ■ 100% of workers receive induction |

| No. | Phase | Identified Risks/Impacts | Management/Mitigation | Responsibility | Monitoring Parameters | Key Performance Indicators (KPI) |
|-----|--------------|---|--|--|---|---|
| | | hours, the absence of worker grievance mechanism, etc.) | <ul style="list-style-type: none"> Require from the Contractors to establish a worker grievance mechanism. Mandate that induction training for Contractor's and sub-contractors workers must include at least, but not limited to: (i) an overview of labour standards, (ii) workers' code of conduct, (iii) workers grievance mechanism, (iv) identification, prevention and reporting of any gender-based violence and harassment (GBVH) incidents. | | | <p>training before starting work</p> <ul style="list-style-type: none"> Grievance mechanism established and accessible All grievances resolved timely 0 confirmed cases of undeclared work or excessive hours |
| 53) | Construction | Potential risks related to employment of foreign workers | <ul style="list-style-type: none"> In line with BiH <i>Law on Foreigners</i>, the Contractor and sub-contractors to ensure that foreign workers are provided with work and residence permits. Foreign workers to be provided with employment contracts in native language(s) and English, clearly outlining terms of employment, wages, working hours and grievance procedure. | <ul style="list-style-type: none"> Contractor | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> 100% of foreign workers have valid permits and contracts before starting work |
| 54) | Construction | Risks and hazards associated with labour influx and workers accommodation camp(s) | <ul style="list-style-type: none"> Contractor must implement all the recommendations outlined in Workers' accommodation: Process and standards – guidance note by IFC and the EBRD. Enforce a Worker Code of Conduct and provide mandatory training on communicable disease prevention, GBVH and community interaction. Worker accommodation camps will be managed in accordance with national standards and international best practices to prevent social tensions and safeguard public health | <ul style="list-style-type: none"> Contractor | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> Camps meet WB/EBRD and national standards 100% of workers receive training No cases of poor living conditions or overcrowding No incidents of community conflict linked to labour influx |
| 55) | Construction | Opportunity for generating local employment | <ul style="list-style-type: none"> Enhance local employment opportunities by prioritising hiring from local communities for general labour roles to the extent possible by advertising job vacancies through local media and local notice boards. Implement training and upskilling programs for local workers. | <ul style="list-style-type: none"> Contractor | <ul style="list-style-type: none"> N/A | <ul style="list-style-type: none"> Evidence of efforts to hire local community members for general labour roles (job advertisements posted in local media/notice boards), based on availability and suitability |

APPENDIX J-2: MONITORING AND SUPERVISION

Table 2: E&S Monitoring and Supervision Plan

| What parameter is to be monitored? | Where is the parameter to be monitored? | How is the parameter to be monitored? | When is the parameter to be monitored (time and frequency)? | Who monitors the parameter (responsibility)? | Cost of monitoring the parameter? |
|--|---|--|--|---|---|
| Construction phase | | | | | |
| Number of nests and roosts | Construction sites and its buffer zone of 10 m | Visual observation during pre-clearance survey is to identify nesting and roosting sites | Daily | Contractor (ECoW), supervised by Supervision Engineer and PRS | Covered under construction and supervision budget |
| Number of nests/roosts discovered during construction | Construction and vegetation clearance zones | Visual observation and manual measurements | Daily during vegetation clearance and establishment of construction sites, weekly during construction activities | Contractor (ECoW), supervised by Supervision Engineer and PRS | Covered under construction and supervision budget |
| Number of speed-related wildlife incidents (e.g., roadkill) | Construction site | Visual observations via daily construction site walkovers | Daily | Contractor (ECoW), supervised by Supervision Engineer and PRS | Covered under construction and supervision budget |
| Groundwater level and seepage presence in excavations | Foundation pits and deep excavation areas | Visual observation and manual measurement (e.g. piezometers) | Daily during excavation works. | Contractor, supervised by Supervision Engineer and PRS | Covered under construction and supervision budget |
| Groundwater quality at nearby springs (if affected) | Sensitive springs, public water sources (e.g. charity fountains) near works | Water sampling and basic quality analysis (turbidity, pH, visual clarity) | Only upon complaint or if excavation occurs in close proximity | Contractor | Covered under construction and supervision budget |
| Hydraulic connectivity and ecological flow of affected watercourses during construction | At culvert construction sites and diverted streams | Visual inspection | During culvert, access road, and spoil disposal site construction. | Contractor | Covered under construction and supervision budget |
| Installation and functionality of sediment control measures (e.g. fences, traps, basins) | Between earthworks and watercourses | Visual inspection | Daily during excavation works. | Contractor | Covered under construction and supervision budget |
| Quality of runoff generated during construction processes | Discharge points on site (e.g. sediment basins outlets, oil-water separators, or other treatment systems) | Water sampling and analysis (e.g. pH, TSS, COD, presence of hydrocarbons) | After major rainfall events or accidental discharges, immediately after each accidental spillage (sampling if contamination is suspected). | Contractor (with accredited laboratory) | Covered under construction and supervision budget |
| Quality of wastewater from concrete batching plants | Effluent discharge points from plants | Water sampling and analysis (e.g. pH, TSS, COD, presence of hydrocarbons) | Initially at the start of operation, then every 6 months, or more frequently if treatment inefficiency | Contractor (with accredited laboratory) | Covered under construction and supervision budget |

| What parameter is to be monitored? | Where is the parameter to be monitored? | How is the parameter to be monitored? | When is the parameter to be monitored (time and frequency)? | Who monitors the parameter (responsibility)? | Cost of monitoring the parameter? |
|---|--|---|---|--|---|
| | | | is observed, or after major rainfall events or pollution incidents. | | |
| Implementation of topsoil management, compaction prevention, erosion control, and contamination prevention measures | Construction zones, topsoil stockpiles, access roads, slopes, camps, and fuel/chemical storage areas | Visual inspection of stripping and stockpiling; check erosion control and slope stabilisation; verify proper storage and washing zones; review WMP, TSMP, LHRP and EPRP records; verify spill kits and machinery logs | Weekly during active works; after heavy rainfall; immediately after any spill or complaint; monthly for documentation review. | Contractor, supervised by Supervision Engineer and PRS | Covered under construction and supervision budget |
| Parameters analysed in the baseline soil quality assessment in the Report, to detect potential soil pollution | Construction site zones with risk of spills or leakage | Visual inspection, followed by soil sampling and accredited lab testing if contamination is suspected ¹² | Only in case of accidental spillage, leakage, or visible signs of contamination. | Contractor, supervised by Supervision Engineer and PRS | Covered under construction and supervision budget |
| Dust levels | At and around construction sites, particularly near sensitive receptors | Visual observations of dust emissions from site and dust deposition at nearby receptors | Daily during construction works, especially during dust-intensive activities (e.g., earthworks, demolition); additionally, upon complaints by the public. | Contractor, supervised by Supervision Engineer and PRS | Covered under construction and supervision budget |
| Noise levels | At and around construction sites, particularly near sensitive receptors | Monitoring must be carried out by an accredited laboratory in line with the Law on Noise Protection in the Environment of RS and its bylaws. | Noise monitoring conducted upon receipt of complaints or during high-noise activities. | Contractor, supervised by Supervision Engineer and PRS | Covered under construction and supervision budget |
| Proper material sourcing, delivery and storage, segregation and disposal of waste, reuse of excavated material, use of licensed handlers and on-site quality control | Entire construction site, storage and waste handling areas Supplier documentation records | Visual inspections; review of permits and licenses, MMP/WMP implementation and updates, delivery/storage logs, training records and waste disposal documentation | Prior to supplier engagement; weekly during construction; spot checks during deliveries and waste-handling phases. | Contractor, supervised by Supervision Engineer and PRS | Covered under construction and supervision budget |
| Location, stabilisation and environmental integration of disposal areas, including humification, drainage ditch construction, slope treatment, geotechnical assessments and proximity to water bodies | Designated disposal sites and surrounding drainage areas | Field measurements, site inspections, and review of geotechnical and drainage documentation | Before use of disposal site, during spoil placement and post-closure. | Contractor, supervised by Supervision Engineer and PRS | Covered under construction and supervision budget |

¹² As there are no laws or bylaws currently in force in Republika Srpska that define contamination thresholds for soil types other than agricultural land, soil quality monitoring should follow the baseline methodology established in this Report. In case of suspected contamination, soil sampling and accredited laboratory testing should be conducted at the affected location. The results should then be compared with a reference soil sample assumed to be unaffected by anthropogenic activities, collected from a location outside the road corridor and beyond the zone of human influence. This comparative approach enables a reliable assessment of potential soil degradation.

| What parameter is to be monitored? | Where is the parameter to be monitored? | How is the parameter to be monitored? | When is the parameter to be monitored (time and frequency)? | Who monitors the parameter (responsibility)? | Cost of monitoring the parameter? |
|--|---|--|---|---|--|
| Operation phase | | | | | |
| Survival, growth and coverage rates of planted native species | Along the road corridor and restoration/revegetation areas | Field surveys including methods such as plot sampling and vegetation transects. Collected data shall include survival rates, vegetation cover percentage, and growth measurements (e.g. height, canopy spread) of planted native species. | First monitoring to be conducted within 3 months following the completion of construction works. Subsequent monitoring will be performed seasonally (spring, summer and autumn) during the first three years of operation. | PRS (engagement of external consultancy) | Annual monitoring budget EUR 1,500 to EUR 2,000 |
| Number and spatial distribution of invasive species | Along the road corridor, spoil disposal sites, access roads and revegetated areas | Visual inspection, species identification, and estimation of cover and abundance using vegetation transects. | Twice annually, in spring and late summer, during peak vegetation periods, for at least three years post-construction | PRS (engagement of external consultancy) | Annual monitoring budget EUR 1,500 |
| Number of roadkill per km | Along the road corridor | Monitoring will be carried out by maintenance staff during regular walk-through surveying or slow driving along the road. | Monthly, during three years post-construction. | PRS (engagement of external consultancy for data analysis, if needed) | Included in PRS maintenance budget for observations, EUR 500 annually for data analysis by external expert (if needed) |
| Structure, positioning and use of artificial shelters, hibernacula, bat boxes, nesting boxes | Along the alignment (at installed structures) | Inspections to ensure proper placement, structural integrity, and to check for signs of damage and use (droppings, nesting material, shedding, visual observations). | Artificial shelters, hibernacula and nesting boxes monitored during early spring and summer, with additional winter monitoring for bat boxes during first three years of operation | PRS (engagement of external consultancy) | Annual monitoring budget EUR 1,500 |
| Distance of drainage discharge points from springs/wells; Quality of runoff prior to discharge | Drainage outlets near identified springs and wells | Field measurement of distance using GPS/maps; Water quality testing per Water Permit (pH, turbidity, TSS, oil traces) | Before operation begins and annually during operation; after complaints or incidents. | PRS (through supervision or third-party service) | |
| Control of stormwater and road runoff quality | At all 48 discharge points from the open drainage system along the road | Monitoring has to be conducted by an accredited laboratory in accordance with the <i>Law on Waters</i> , the <i>Rulebook on the Conditions for Discharging Wastewater into Surface Waters of RS</i> , and the Environmental ¹³ and Water Permit ¹⁴ . | The timing and frequency of monitoring will be defined in the Water Permit, in accordance with the Rulebook on the Conditions for Discharging Wastewater into Surface Waters of RS and will also depend on the volume of road runoff generated. | PRS | EUR 100 to 150 per discharge point ¹⁵ |

¹³ Environmental Permit has been obtained from the competent authority, Ministry of Spatial Planning, Construction and Ecology of Republika Srpska.

¹⁴ Water Permit to be obtained from the competent authority, Public Company Vode Srpske.

¹⁵ Please note that both the Main Design and the hydrological study are planned to be updated. The currently foreseen number of 48 discharge points may be revised and potentially reduced as part of the planned design update.

| What parameter is to be monitored? | Where is the parameter to be monitored? | How is the parameter to be monitored? | When is the parameter to be monitored (time and frequency)? | Who monitors the parameter (responsibility)? | Cost of monitoring the parameter? |
|--|---|--|--|--|--|
| | | The Water Permit will define the parameters to be monitored and the applicable limit values for surface runoff from the road, in line with those specified in the Rulebook. Sampling and laboratory analysis must be carried out by an accredited laboratory included on the official list of authorised laboratories maintained by PC Vode Srpske. | | | |
| Visual inspection of drainage structures (e.g. culverts, channels, basins, outlets) | Along the alignment (at installed drainage structures) | Visual inspection | Following heavy rainfall events and as part of regular weekly monitoring during the operational phase. | PRS | Included in PRS operational budget |
| Noise levels | At selected sensitive receptor locations near the road corridor upon their complaints | Monitoring must be carried out by an accredited laboratory in line with the <i>Law on Noise Protection in the Environment of RS</i> and its bylaws. | Noise monitoring conducted upon receipt of complaints. | PRS | EUR 300 to 600 |
| Identification and tracking of all waste types and quantities, engagement of licensed waste operators, application of relevant maintenance-phase waste handling measures | Throughout the operational corridor, maintenance sites and waste handling points | Review of internal waste management documentation, operator contracts, EPRP records, emergency training logs, and results of internal audits | Quarterly during operation; additional checks during maintenance or emergency response events. | PRS and contracted maintenance company | Included in PRS operational budget and contractor service agreements |

APPENDIX J-3: CHARITY FOUNTAINS LOCATIONS

