Republic of Serbia
Ministry of European Integration

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#ЕУ ЗА ТЕБЕ

NON-TECHNICAL SUMMARY - RAILWAY LINE BELGRADE–NIŠ, SECTION II VELIKA PLANA–PARAĆIN

EU PPF
PROJECT PREPARATION FACILITY

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LIST OF ABBREVIATIONS AND ACRONYMS

AZE	Alliance for Zero Extinction (Alijansa za nulto istrebljenje)
BAP	Biodiversity Action Plan (Akcioni plan za biodiverzitet)
BATs	Best Available Techniques (Najbolje dostupne tehnike)
BMP	Biodiversity Management Plan (Plan upravljanja biodiverzitetom)
CBA	Cost - Benefit Analysis (Analiza troškova i koristi)
CDW	Construction and Demolition Waste (Otpad od građenja i rušenja)
CH	Critical Habitats (Kritični habitat)
CITES	*Convention on International Trade in Endangered Species (Konvencija o međunarodnom prometu ugroženih vrsta)*
EAAA	*Ecologically Appropriate Areas of Analysis (Ekološki odgovarajuće oblasti analize)*
EBRD	European Bank for Reconstruction and Development (Evropska banka za obnovu i razvoj)
EIA	Environmental Impact Assessment (Procena uticaja na životnu sredinu)
EIB	European Investment Bank (Evropska investiciona banka)
ESIA	Environmental and Social Impact Assessment (Procena uticaja na životnu sredinu i socijalna pitanja)
ESMP	Environmental and Social Management Plan (Plan upravljanja životnom sredinom i društvenim pitanjima)
ESPOO	The Convention on Environmental Impact Assessment in a Transboundary Context (Konvencija o prekograničnom uticaju na životnu sredinu)
EU	European Union (Evropska Unija)
EUD	European Union Delegation (Delegacija Evropske Unije)
EUNIS	European Nature Information System (Evropski informacioni sistem o prirodi)
FS	Feasibility Study (Studija opravdanosti)
GDP	Gross Domestic Product (BDP – Bruto domaći proizvod)
GHG	Greenhouse gas (Gas staklene bašte)
GSM-R	Global System for Mobile Communication – Railway (Globalni sistem mobilne komunikacije za železnice)
HD	Habitat Directive (Direktiva o staništima)
HGV	Heavy Goods Vehicle (Teško teretno vozilo)
IBA	Important Bird Areas (Značajna područja za ptice)
IBAT	Integrated Biodiversity Assessment Tool (Integrisani alat za procenu biodiverziteta)
ILO	International Labour Organization (Međunarodna organizacija rada)
IPA	Important Plant Areas (Značajna područja za biljke)
IPF	Infrastructure Project Facility (Podrška infrastrukturnim projektima)
IUCN	International Union for Conservation of Nature (Međunarodna unija za zaštitu prirode)
MCA	Multi Criterial Analysis (Multikriterijumska analiza)
MEI	Ministry of European Integration (Ministarstvo za evropske integracije)
MCTI	Ministry of Construction, Transport, and Infrastructure (Ministarstvo građevinarstva, saobraćaja i infrastrukture)
PBA	Prime Butterfly Areas (Odabrana područja za dnevne leptire)
PBF	Priority Biodiversity Features (Prioritetne karakteristike biodiverziteta)
PD	Preliminary Design (IP- Idejni projekat)

PFS	Pre-feasibility study (Prethodna studija opravdanosti)
PPF9	Project Preparation Facility 9 (Pomoć u pripremi projekata 9)
RAP	Resettlement Action Plan (Akcioni plan za raseljavanje)
ROS	Republika Srbija
SEETO	South-East Europe Transport Observatory (Transportna opservatorija za jugoistočnu Evropu)
SEP	Stakeholder Engagement Plan (Plan angažovanja zainteresovanih strana)
SRI	Serbian Railways Infrastructure (IŽS – Infrastrukture Železnice Srbije)
SRT	Safety in Railway Tunnels (Bezbednost u železničkim tunelima)
TEN-T	Trans-European Transport Network (Transevropska transportna mreža)
TSI	Technical Specifications for Interoperability (Tehničke specifikacije interoperabilnosti)
UNESCO	The United Nations Educational, Scientific and Cultural Organization (Organizacija Ujedinjenih Nacija za obrazovanje, nauku i kulturu)

CONTENTS

1. SUMMARY

1.1. Introduction

The railway line Belgrade–Niš represents one of the most important corridors in the Republic of Serbia and plays a crucial role in the overall concept of developing the transportation system. It is part of the SEETO Corridor X and connects Central and Western Europe with Greece, Turkey, and the Middle East, and is also part of the indicative expansion of the Core TEN-T railway network in the Western Balkans.

This document is based on information regarding section II (Velika Plana–Paraćin) from the Preliminary Feasibility Study (PFS) for the "Reconstruction and modernization of the Belgrade–Niš railway" conducted by the PPF9 team in 2022.

The data within this report present available basic information regarding environmental and societal protection obtained through theoretical research and field visits at the time of report writing, and the currently available technical (engineering) project (Conceptual Design) which is in progress. Additional field research, such as air quality, noise and vibrations, surface waters, etc., as well as additional biodiversity assessment along the corridor, will be conducted and presented in the ESIA report.

The section Velika Plana–Paraćin, part of the railway line Belgrade Center–Niš, is 78.7 km long. The study covers a section of 50 km from Velika Plana to Gilje. It is planned that at Gilje, the newly projected section will connect with the already modernized section Gilje–Paraćin, where no further works will be carried out.

The PPF9 team for this particular subproject, or the SAFEGE consortium (composed of Egis, EPEM, and KPMG), has signed a contract as the executor of this subproject. The consultant's main task is to provide the Feasibility Study, Conceptual Design, as well as ESIA and EIA in accordance with national legislation.

1.2. Legal framework

The regulations concerning environmental and social aspects applicable to this project are numerous and diverse. Therefore, in this section, only key requirements related to the project are selected. However, a comprehensive and detailed list of legislation pertaining to the project will be developed as part of the project management system for construction and operation.

The Environmental Impact Assessment (EIA) procedure in the Republic of Serbia is regulated by the Law on Environmental Impact Assessment, which is harmonized with the European EIA Directive (85/337/EEC, 97/11/EC, 2003/35/EC, and COM 2009/378 as accepted by Directive 2011/92/EU and amended by Directive 2014/52/EU).

1.2.1. National Regulatory Framework for Environment and Social Aspects

This legal, legislative, and institutional framework for environmental protection and societal considerations in Serbia is based on the Constitution of Serbia, which enshrines the right to a healthy environment and the obligation of all, in accordance with the law, to protect and improve it. Health and the environment are also supported by numerous government strategies, international agreements, and sustainable development goals and Millennium Development Goals. Environmental protection legislation in Serbia encompasses over 100 laws and regulations. Currently, most of them are aligned with the directives of the European Union and other legislation.

National EIA Procedure The Law on Environmental Impact Assessment ("Official Gazette of RS", no. 135/04 and 36/09) regulates the process of environmental impact assessment, the content of EIA, public participation, involvement of interested authorities and organizations, international notification of projects that may have significant impacts on other environments and their commencement, as well as other important issues for EIA.

The impact assessment covers projects in the fields of industry, mining, energy, transportation, tourism, forestry, agriculture, water management, waste management, municipal activities, and projects planned in protected natural areas or areas of special purpose as defined by the Regulation on determining the list of projects for which an environmental impact assessment is mandatory and the list of projects for which an environmental impact assessment may be required ("Official Gazette of RS", no. 114/08).

The Ministry of Environmental Protection is responsible for the environmental impact assessment procedure and grants approval for EIA, in accordance with the Law on Environmental Impact Assessment.

The Regulation on determining the list of projects for which an environmental impact assessment is mandatory and the list of projects for which an environmental impact assessment may be required ("Official Gazette of RS", no. 114/08) establishes List I projects (for which an environmental impact assessment is mandatory) and List II projects (for which an environmental impact assessment may be required). The subject project is categorized as List I, under item 7. Construction: 1) Main railway lines including accompanying facilities (bridges, tunnels, and stations).

The Law on Environmental Impact Assessment ("Official Gazette of RS", no. 135/04 and 36/09) regulates the procedure for environmental impact assessment, the content of the environmental impact assessment study, participation of interested authorities and organizations and the public, cross-border notification of projects that may have significant environmental impacts, supervision, and other environmental impact assessments.

This project proposal falls under category "A" of the EBRD screening categorization. As such, the project requires a special, formalized, and participatory assessment process in accordance with the EBRD's comprehensive set of

specific performance criteria (PRs) expected to be met, covering key areas of environmental and social impacts and issues.

Preliminary Description of Environmental and Social Basis This section describes the main components of the physical and natural environment in the area affected by the implementation of the proposed Project. The characterization of the existing environment and identification of sensitivities along the proposed railway route involved a comprehensive review of a wide range of existing data sources and basic field checks.

1.3. Project description

The provided data is based on the information for section II (Velika Plana–Paraćin) from the Preliminary Feasibility Study (PFS) for the Reconstruction and Modernization of the Belgrade–Niš railway, prepared by the PPF9 team, in 2022.

The two-track section Velika Plana–Paraćin, part of the Belgrade Center–Niš railway, is 78.7 km long.

The route of the planned two-track railway starts at the Velika Plana passenger station and ends at the Paraćin station. It is planned that the highest category of international passenger trains will operate at a speed of up to 200 km/h, while other passenger trains will operate at speeds below 200 km/h, depending on the train category.

The design speed, both for passenger and freight trains, is 100 km/h on switchbacks.

Taking into account the category of the railway line and the design speed of 200 km/h, the project envisages the fencing of the railway line. A protective wire fence is planned for the entire section.

On the parts of the railway where noise protection is required, the project envisages the construction of barriers for noise protection, 3.5 meters high at the edge of the planum.

On the section from Velika Plana to Gilje, there are 8 bridges, 11 overpasses and 5 underpasses.

1.4. Preliminary Description of Environmental and Social Foundations

This section describes the main components of the physical and natural baseline environment in the area affected by the implementation of the proposed Project. The characterization of the existing environment and identification of sensitivities along the proposed railway route included a comprehensive review of a wide range of existing data sources and basic field checks.

1.4.1. Description of the Environment

The climate in the project area ranges from continental to moderately continental, with precipitation typically ranging from 500–600 mm/year, while air humidity is moderate. These areas are sparsely forested, with most of the land being cultivated. The region experiences relatively cold winters, autumns warmer than springs, and moderately warm summers. Specifically, low annual rainfall predominates, while summer rainfall is characterized by high evaporation due to high temperatures, with frequent summer storms and showers. Wind is a significant factor causing temperature variations, bringing precipitation or drought by the penetration of moist and cold air from the Atlantic Ocean from the west and southwest, warm air from the Mediterranean, as well as the penetration of cold air masses from the north and northeast.

According to the map of climatic regions of Serbia, two main climatic regions, A and B, can be defined. The railway route passes only through subregion A-1-a. The absolute extreme air temperatures in this subregion range from -32.6°C to 42.3°C. The average winter temperature is above 10°C, and in summer, it is above 20°C. Spring temperatures are slightly different from autumn temperatures. The average annual precipitation in lower areas is about 520 mm, and sometimes exceeds 650 mm. Winter precipitation is the least, while spring precipitation is somewhat higher than in autumn.

On the route of the Velika Plana - Paraćin railway, the oldest lithological layers are represented by Proterozoic gneisses and gneiss-mica schists (G), amphibolite gneisses (Gam), muscovite mica schists (Sm), and migmatites (Mi), black quartzite (Qgr), mica schists (Smb), amphibolites, and amphibolite schists (A), and dolomitic marbles and marls (Md). Post-Cambrian older Paleozoic rocks are represented by granites (γ) and aplites (φ). In parts of the terrain composed of gneisses and schists in the form of wire bodies resistant to weathering, aplites (φ) are recorded. Jurassic rocks include limestone and dolomites.

The project area is mainly characterized by fluvial and fluvioglacial soils. The main types of soils are alluvial, arable alluvial, and alluvial meadow soils.

According to the data from the Environmental Protection Agency of the Republic of Serbia, erosion is one of the main processes of soil degradation and a cause of deteriorating soil quality, with water erosion prevailing in coastal areas of large rivers, central, and hilly-mountainous areas. Erosion is particularly pronounced in the coastal part of the Velika Morava, where during high water periods, the shore erodes, leading to changes in the riverbed morphology. This phenomenon is partially mitigated by setting up flood protection structures and arranging coastal areas.

The project area is mainly covered by agricultural land (fields, cultivated crops, and fields) and forests. The project area is mainly flat agricultural and mountainous area (orchards and vineyards) and belongs to alluvial soil. Alluvial deposits in the valleys of the Velika Morava have great agricultural value and belong to the second class of agricultural land.

In terms of hydrogeological potential, an aquifer formed in the alluvial deposits of the Velika Morava is particularly significant, representing an extremely important resource for water supply.

Groundwater represents the most important water resource in the central part of the Velika Morava basin, which is used for water supply.

The current situation regarding groundwater protection can be characterized as poor, and it applies to all structures where only the first sanitary protection zone exists, while the second and third sanitary protection zones are usually not defined or not respected.

The hydrographic network is quite dense on flat terrain through which the existing railway passes, including the larger river Velika Morava and its tributaries.

According to the Regulation on the categorization of watercourses, the water of the Velika Morava corresponds to class IIa, while the water of the South Morava corresponds to classes IIa and IIb.

As there is no acoustic zoning for the subject area, the selection of permitted noise levels was made in accordance with the Regulation on noise indicators, limit values, methods of assessing noise indicators, disturbances, and adverse effects of noise in the environment ("Official Gazette RS", No. 75/2010). Based on this Regulation, the subject area of the Belgrade-Niš railway section belongs to noise zone 5 (industrial, administrative-governmental zone with apartments, zone along highways, main roads, and urban avenues). The noise limit values in zone 5 are 65 dB(A) for day and evening, and 55 dB(A) for night. These limitations are required by local laws in force. Reference noise values defined in the WHO Guidelines on Environmental Noise for the European Region (2018) will be used in this study as these requirements are stricter than local and EU requirements. The analysis of noise impact caused by the projected traffic volume on the Belgrade-Niš railway section will be determined using the CadnaA software package.

Vibrations and low-frequency noise generated by railway traffic will be calculated using the VIBRA.

1.4.2. Social Environment

Section 2 of the Belgrade-Niš railway begins in the town of Velika Plana and ends in the town of Paraćin. The railway passes through parts of the city of Jagodina, three larger cities, Ćuprija, Lapovo, and Velika Plana, as well as through numerous small villages surrounding the existing and planned railway.

The new railway route will avoid and/or be distant from four settlements: Staro Selo in Velika Plana (partially) and Miloševo (partially), Novo Lanište, and Ribnik, all three in the Jagodina municipality. Additionally, a section of Section 2, from Gilje station in the Mijatovac settlement (Ćuprija) to Paraćin station, has been modernized in the past by

constructing a new double-track railway for speeds up to 160 km/h. This section will not be subject to new reconstruction, but minor additional construction work may be required to enable achieving a speed of 200 km/h.

The directly affected population along the railway corridor can be estimated at over 90,000; however, this includes the total population of the three larger cities and the city of Jagodina, as there is no information on the number of residents in specific areas through which the railway passes.

Serbia as a whole, including municipalities affected by the Project, has seen a significant decline in population numbers in recent decades. The average age of the population in 2021 in all municipalities is higher than the national average (43.5 years). The aging index of the population, which represents the ratio of the number of elderly people (aged 60 and over) to younger people (aged 0–19), in 2021 ranges from 153.9 in Jagodina to 196.7 in Ćuprija, which is alarmingly high. Serbs constitute the majority population in all affected areas, with the second-largest ethnic group being Roma. As expected, in line with the ethnic composition, the majority of the population in all areas belongs to the Serbian Orthodox faith.

In terms of development levels, Velika Plana, Batočina, and Ćuprija all belong to the third category of municipalities, with a level of development between 60% and 80% of the republic's average. Jagodina and Batočina are better positioned, as second-category municipalities, with a level of development between 80% and 100% of the republic's average.

Jagodina is the largest city in the region and as such, an important economic center with three major factories for cable production, beer, and meat processing. The local government has made significant efforts over the past two decades to attract foreign investments, and there are several additional factories operating in this city, mostly producing auto parts, furniture, and cardboard packaging. In Ćuprija, the main areas of development are focused on the food, metal, and wood industries. The situation in Velika Plana is similar, with an additional focus on the construction industry. Agriculture is also an important source of local development, although far from the actual potential the municipality possesses. Agriculture is also the backbone of the economy in Batočina. In Lapovo, the most significant employers are public railway companies, including the infrastructure of Serbian Railways. The municipality is small, and the rural population compared to the only urban center (Lapovo varoš) is also small, however, agriculture is a significant part of the local economy. The construction sector is also among the more important in terms of employment in the municipality.

When analyzing employment sectors in municipalities, it is evident that the majority of people work in the manufacturing industry, and the values in all municipalities are above the national average (22%). Other important sectors of employment are trade, transport, and storage, as well as education, health, and social services.

The percentage of registered unemployed among the estimated working-age population (19 to 64 years old) is highest in Batočina, at 20%, followed by Lapovo (15%), Jagodina (14%), Ćuprija (12%), and Velika Plana (8%). Average net wages in all municipalities are below the republic's average (713 euros in July 2023). Wages have increased in the past year in all municipalities, between 6 and 12%.

The percentage of people with no education or incomplete primary education ranges from 15 to 19% in affected municipalities, which is above the national average of 14%. The high school completion rate is the same or lower than the national average in all municipalities, except in Lapovo, where it is higher. The completion rate of higher education (college or university degree) is significantly lower than the national level, especially in Velika Plana, Lapovo, and Batočina, where it is half the national average.

The life expectancy at birth in 2021 ranges from 72.89 years in Ćuprija to 74.29 years in Lapovo and is longer than the national average in all municipalities. The most significant causes of death in 2021 in all municipalities were cardiovascular diseases (ranging from 36% in Jagodina to as much as 52% in Batočina). In 2021, the second and third most significant causes of death were cases related to Covid-19 and tumors. All municipalities also have at least one primary health care center in the center of the municipality.

In Ćuprija and Jagodina, there is a general hospital, while the remaining three municipalities do not have one. All municipalities also have at least one health center in the municipality center.

The main road near the segment 2 of the Belgrade-Niš railway is the E-75 highway. This road runs parallel to the railway at most locations between Velika Plana and Paraćin, and smaller roads will be used to access project locations. State road 158 also runs parallel to most of segment 2 of this railway line and will likely be used to access project locations. Electrical and telecommunication networks are developed in all local communities. The outskirts of larger cities have a sewage system, while in smaller villages, wastewater is mostly discharged into septic tanks. The water quality in local water supply networks complies with acceptable standards. Solid waste disposal is organized in local communities, often on a weekly basis, but unfortunately, there is still a habit among the local population to dispose of waste in illegal landfills. Villages have public lighting, at least in central locations, and most have bus connections to municipal centers or other parts of the country.

Jagodina is the largest municipality territorially, while Lapovo is the smallest of the five mentioned, but also one of the smallest municipalities in Serbia. Agricultural land dominates over forest land in all municipalities, and it is present everywhere to a greater extent than the national average of 70%. Agriculture also dominates in land use along the railway corridor, as it passes through rural areas with small villages and arable fields. The number of inhabited, more urbanized areas along the railway corridor is higher than on segment 3, as it passes through parts of three inhabited places: Velika Plana, Lapovo, and Ćuprija, as well as through the city of Jagodina.

All private land needed for the construction and reconstruction of the railway line, as well as all related facilities, will be acquired through expropriation, or the process of involuntary land acquisition. Most of the land will be permanently acquired, while some smaller areas along the railway line may be temporarily occupied during construction, for construction camps, equipment storage rooms, etc. The project will aim to use public land for these purposes.

.On the Velika Plana–Paraćin railway section, four existing stations are being maintained, reconstructed, and modernized: Velika Plana, Markovac, Bagrdan and Jagodina. A new Lapovo station is planned, the central location of two official places (Lapovo Varoš and Lapovo). The existing stops Staro Selo, Novo Selo, Lapovo Varoš and Lapovo Ranžirna are being abolished.

The current railway line is not fenced, and there are many level crossings (25). The new railway, which will have faster trains and more frequent rail traffic, will be fenced, and most level crossings will be closed (only two will remain). Measures are being taken to replace these crossings for pedestrians and vehicles, with additional underpasses and overpasses, some of which also need to take into account the size of the agricultural machinery used by the local population, and through which this machinery will have to pass.

1.5. Ecological and Social Evaluation of Options

A Prior Feasibility Study (PFS) was conducted by the PPF9 team in 2022. It includes a project scope report, a stakeholder engagement plan (SEP), and a preliminary RAP (Resettlement Action Plan). Within the PFS, a multicriteria analysis (MCA) was conducted, considering three alternatives for further development, as well as a no-project scenario.

Alternative 2 was chosen as the final framework for the railway line modernization. Further development of the selected Alternative 2 is underway through the Conceptual Design. The chosen alternative from the PFS serves as the basis for further development through the Conceptual Design. The aim of further route development is to further reduce environmental impacts, primarily on biodiversity, noise and vibration reduction, and property expropriation, which causes physical and economic displacement. The EBRD's mitigation hierarchy has been and will continue to be applied - to avoid, and if not possible, to minimize and mitigate identified impacts.

Alternatives will be selected during the development of the Environmental and Social Impact Assessment (ESIA), and the basis for the selected alternatives will be presented in the ESIA.

1.6. Key Environmental and Social Impacts

Climate Change Projected changes may have a negative impact on the project during the construction period, especially during potentially sensitive construction seasons, but the overall impact is expected to be minimal or

negligible. During railway operation, a minimal to negligible impact of climate change is also expected. During railway operation, the impact of climate change is expected to be low to negligible. During the construction phase, construction machinery and transportation vehicles using fossil fuels will be used, as well as equipment powered by electricity. Some vegetation along the new railway sections will need to be removed, reducing the potential for carbon sink and likely releasing biogenic carbon stored in biomass. Both factors are relatively small and localized, so the overall impact of the project on climate change during construction can be considered negligible. The overall impact of the project on climate change will be further assessed in the Environmental and Social Impact Assessment (ESIA). It is estimated that the overall impact of the project on climate change will be negligible to low adverse.

Geohazards

The main impacts on the land during the construction phase may include the occurrence of landslides along the route concerning terrain type and slope stability. Removal of the surface layer can pose risks of soil erosion and increased water runoff and sedimentation in intermittent streams. The use of heavy machinery and equipment, especially on steep slopes for clearing the construction corridor, can also lead to serious compaction or erosion problems.

During the operational phase of the project, pollutants will not be directly discharged onto the land. The only potential effects related to geology and soil characteristics are soil liquefaction and settlement, as well as erosion and sedimentation.

The effects and mitigation measures are similar to those in the construction phase. The overall potential effects can be assessed as local, with low probability and significance.

The Velika Plana - Paraćin railway section is located in an area of seismic intensity VII and VIII according to the MCS scale. A possible earthquake of the mentioned intensity cannot cause serious consequences along the railway line and at station facilities, both for the lives of employees and for the environment. It is expected that these potential impacts will be negligible to minor.

Soil

During the construction phase, soil pollution can primarily be caused by improper handling of oil and oil derivatives used for construction machinery and other devices during construction. Contamination can also occur if vehicle and machinery cleaning is inadequately done outside designated areas, with improper construction site organization and other activities not carried out in accordance with recommended technical measures during construction. Soil pollution can be minimized or completely eliminated by following prescribed technical measures. Possible impacts are expected during the operational phase due to the movement of machinery and equipment. The negative impact of structural damage and soil compaction caused by heavy machinery usage (especially on wet soil) can be mitigated by protective measures using existing access roads. During the operational phase, there will be a negative impact

on the soil due to its permanent loss. Soil pollution will mainly result from pollution from atmospheric precipitation; disposal of organic and inorganic waste; spillage of loads; deposition of atmospheric particles from wind and dispersion due to vehicle movement. Excessive pollution may occur during various accidents, tank leaks, fuel spills, or equipment failure, leading to soil contamination. During construction work, there is expected to be a negative impact on agricultural land due to excavation. The fertile surface layer with vegetation or crops will be removed from agricultural land, within the width of the work corridor, during the construction of railways, stations, and possibly the construction of temporary access roads. The impact on agricultural land during the construction phase is temporary, linear, and local because it relates to the period of construction work and the work corridor. During the operational phase, the most significant impact on agricultural areas concerns the loss of agricultural land in the railway construction area and railway stations.

Water

During the construction phase in the long-term plan, railway reconstruction should contribute to reducing the risk of surface and groundwater pollution by improving railway drainage conditions. Improving the technical condition of the railway will increase transport safety and significantly reduce the risk of accidents. Negative impacts on surface water quality most commonly and easily manifest on bridges above certain watercourses, on sections of watercourses parallel to the railway route, as well as on culverts for smaller, torrential, and intermittent watercourses, and parts of the route with a high level of the first aquifer. Temporary impacts occurring during construction works, such as drainage, can cause surface water pollution and affect the shoreline. Works involving spillage can cause soil pollution, while excavation and disposal of contaminated soil can lead to groundwater pollution, and vegetation removal can cause stream turbidity. Regarding potential surface and groundwater pollution, temporary impacts may occur during material transport processes, construction works, and temporary waste disposal. Such impacts are generally short-term. During the operational phase, land, surface, and groundwater can be polluted due to railway vehicle traffic. Only in cases of accidents, during the transport of oil and its derivatives, oil, and liquid hazardous substances, significant pollution of surface and/or groundwater can be expected. The consequences are usually limited in duration and scope, but in the event of accidents, appropriate preventive, protective, and remedial measures are necessary, and in special situations, accidents can have serious long-term consequences. Furthermore, negative impacts on groundwater and surface water can occur through railway track maintenance procedures (Regulation 309 on chemical weed and shrub control, Official Gazette of ZJZ, no. 8/90). According to this regulation, chemical weed and shrub control on the track are carried out as needed in spring, summer, or autumn, depending on the applicable herbicide-arboricide, which are listed in this regulation.

Noise and Vibrations

During the construction phase, noise can mainly be caused by construction activities, transportation, and material handling, while the recipients of the noise are construction workers, nearby settlements, and flora and fauna along

the railway line. During construction works, it is necessary to conduct periodic noise measurements to ensure that the generated levels do not exceed the legally permissible limits. In the operational phase, the main source of noise will be the operation of the railway itself, with potential recipients being maintenance workers, nearby settlements, and flora and fauna along the railway line.

Landscape

The construction phase will result in a significant change in the perception of the terrain within the affected area, and in some cases, it may obstruct the view of the broader surroundings. Besides being relatively short-term, such impacts are common in linear projects and can be partially mitigated by relevant measures. Considering that the new route largely overlaps with the existing one, the character of the landscape will not undergo significant changes. The visual experience will also largely remain unchanged once the works are completed.

Biodiversity, Protected Areas, and Habitats

During the construction phase, possible identified negative impacts on biodiversity and protected areas include: habitat loss, habitat degradation, habitat fragmentation, disruption of ecological corridors, loss of flora, pesticide use, direct mortality, disturbance of species including noise/vibrations, and visual disturbance. Construction activities (excavation, transportation, construction of railway facilities) will cause temporary and localized increases in ambient noise. Dust levels will be elevated. It is expected that a layer of dust will form on vegetation near all construction sites, temporarily disrupting evapotranspiration and photosynthesis processes. The expected layer of dust will be spatially limited, temporary (depending on meteorological conditions), and therefore will not significantly impact plant vitality. Habitats along riverbanks will be intersected by bridges. During the reconstruction/construction of these bridges, the mentioned habitats will be directly affected by the works. The impact will be stronger at locations where the construction of new bridges is planned. However, this impact can be considered temporary. The construction phase of the project may disrupt the migration of large mammals. Mortality of mammals is not expected due to their avoidance of construction areas and seeking refuge in surrounding shelters. Birds are expected to avoid the construction area. Locally present herpetofauna specimens are expected along habitats near rivers. Individual animals may be affected during construction works. By conducting construction works in accordance with regulations and professional rules, it is possible to prevent potential negative impacts on soil and vegetation due to uncontrolled spillage/leakage of hazardous materials (oil or fuel) from equipment and machinery. An assessment of critical habitats will be conducted as part of the Environmental Impact Assessment study after the completion of biodiversity surveys and the conclusion of the basic assessment, when the completion of the EIA will be defined. During the operational phase, increased human presence locally will disrupt existing fauna species, which will migrate to untouched habitats nearby. A comprehensive assessment will be prepared based on annual surveys conducted. Identified impacts can be reduced by prescribing additional measures when areas with higher fauna activity are identified. Based on this, the need for prescribing additional measures will be known.

Air Pollution

The observed railway section Velika Plana–Paraćin is electrified, so it has minimal impact on air quality, regardless of the chosen variant. During the construction phase, the main causes of potentially negative impact on air quality are emissions from construction works and the presence of construction machinery at the construction site. Operational phase - The existing and modernized railway section is electrified, so it does not fall into the group of sources emitting air pollutants. It can be concluded that, compared to the current situation in terms of air pollution, the project does not have a significant negative impact on the environment. By modernizing the railway along with upgrading both tracks along the entire length, as well as increasing transport speed, gas emissions will indirectly be reduced if the goal of increasing rail transport of goods and passengers compared to road transport is achieved.

Resources and Waste

During the construction phase, there are several impacts that can arise from poor waste management and inadequate sourcing of materials. Potential negative impacts of the Project during the construction phase include inefficient handling of excavated material, storage, and disposal causing environmental pollution or sedimentation of water resources, environmental pollution (especially watercourses, groundwater, and soil) due to leakage and spillage of waste associated with poor waste handling and storage, short-term particle emissions such as dust, associated with handling and storage of certain types of waste. By far the most significant waste generated in the Construction Phase of the project is soil/rock from excavation activities. During the construction phase, the negative impact of waste could include: greenhouse gas emissions (during transportation and concrete production), water consumption, ecological impacts, visual impacts on ecology, water, and air from demolition waste, excavated material, dismantling of existing railway tracks, and waste from construction sites. In the operational phase, possible types of waste include many types of municipal waste generated by passengers and train staff or station staff.

Social Impacts

The operation of the railway is expected to have positive impacts on local communities in terms of improved and safer transportation, as well as opportunities for further economic development, including tourism development. Along the railway route, there are areas of significant cultural heritage as well as natural landscapes, which will be more accessible to tourists, especially if local infrastructure and tourist services are developed. Positive impacts in this area can be achieved as the project will contribute to safer and more reliable public transportation, tourism development, and employment opportunities, all of which can benefit women, especially those living in rural areas. The development of the railway and the improvement of the quality and speed of passenger transport will attract more people to use this form of public transportation. It is possible that as a result, some current providers of public transportation services (local bus companies, taxi drivers) may lose access to customers and experience business losses. Further plans to provide direct support to municipalities or any local initiatives or activities will be explored in

the ESIA study, and measures to enhance such support in line with international best practices will be proposed. Detailed mitigation measures to address impacts related to land use and land acquisition, including physical and economic displacement, will be outlined in the project's Resettlement Action Plans, which will be publicly available. In summary, key measures to meet international standards and requirements include: Compensation to all affected individuals at full replacement value, both for formal and informal property registered before the cutoff date, and for any damage caused by the project, providing assistance to physically and economically displaced persons, with special measures for all vulnerable individuals and/or households; and implementing measures to restore income sources for all categories of economically displaced persons.

Mitigation measures for impacts related to community separation and loss of access include: consulting with local stakeholders, including communities, on the locations of underpasses and overpasses and their construction. Assistance should be provided to businesses that lose direct access to the railway via private tracks for freight transport in collaboration with relevant authorities.

To mitigate potential impacts on infrastructure and municipal services, the following measures will be implemented: consulting with local stakeholders, including communities, on the planned closure of stations/stops; providing options for integrated public transportation for affected local communities; and implementing small investments to mitigate disturbances related to construction and/or permanent damage.

Best practice measures will be applied to manage risks related to community safety and security, including restricted access to unauthorized areas, conducting local safety awareness campaigns, measures to manage potential influx of workers, etc. Proposed measures also include those specifically aimed at addressing identified risks related to gender-based violence and abuse of women.

A key measure for mitigating all impacts is maintaining regular communication with local communities and managing complaints.

The project will seek to enhance local employment and encourage local procurement by implementing the following measures: organizing training for potential workers from local communities; posting job advertisements and procurement notices at the local level and encouraging women to apply; implementing transparent and fair employment procedures; and providing a grievance mechanism for workers. It is important to ensure that any worker accommodation used complies with best practices and that there are policies determining the quality and management of accommodation and service provision, which will be implemented in practice.

In the operational phase of the project, significant negative impacts are not expected, and it is assumed that the impacts will be mostly positive. Nevertheless, mitigation measures for any identified negative impacts will be defined and presented as part of the ESIA study.

1.7. Stakeholder Engagement

At the corridor level of the Belgrade-Niš railway, a Stakeholder Engagement Plan was developed during the pre-feasibility study phase of the project, which is available on the website of Serbian Railways Infrastructure. This Plan provides general guidelines for future planning and implementation of stakeholder engagement related to the project.

For the Velika Plana–Paraćin section, an annex to the Stakeholder Engagement Plan will be prepared to present the involvement of stakeholders conducted during the ESIA study phase, the main results of the engagement, how they are incorporated into project planning, as well as collaboration planned during the construction and operational phases. This annex to the Plan will also be available on the website of Serbian Railways Infrastructure.

Serbian Railways Infrastructure bears overall responsibility for all stakeholder engagement activities related to the project, with coordination provided by the Project Implementation Unit. The Project Implementation Unit will appoint Community Liaison Officers, who will be the main points of contact for organizing stakeholder engagement activities and managing complaints at the local level.