

PROJECT: CONSTRUCTION OF A1 EXPRESSWAY SECTION: RAEC RIVER BRIDGE – DRENOVO INTERCHANGE



NON-TECHNICAL SUMMARY

MAY, 2014



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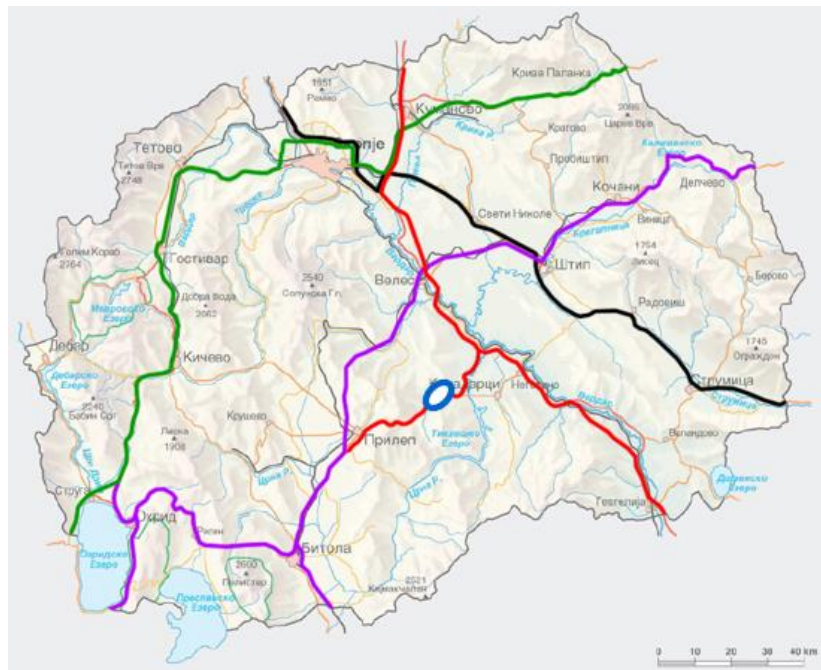
LIST OF ABBREVIATIONS

| | |
|-----------------|--|
| CO | Carbon monoxide |
| EBRD | European Bank for Reconstruction and Development |
| EIA | Environmental Impact Assessment |
| ESAP | Environmental and Social Action Plan |
| ESIA | Environmental and Social Impact Assessment |
| ESP | Environmental and Social Policy |
| ISO | International Standards Organisation |
| IUCN | International Union for the Conservation of Nature |
| LARF | Land Acquisition and Resettlement Framework |
| LRF | Livelihood Restoration Framework |
| MOEPP | Ministry of Environment & Physical Planning |
| NO _x | Oxides of nitrogen |
| NTS | Non-Technical Summary |
| O.G. | Official Gazette |
| PESR | Public Enterprise for State Roads |
| PM | Particulate matter |
| PR | Performance Requirement |
| RAP | Resettlement Action Plan |
| SEA | Strategic Environmental Assessment |
| SEP | Stakeholder Engagement Plan |
| SO _x | Oxides of sulphur |
| TEN-T | Trans-European Network-Transport |

1 INTRODUCTION

As part of the overall plan for the improvement of the national road network, outlined in the Republic of Macedonia's National Transport Strategy (2007-2017),¹ the Public Enterprise for State Roads (PESR) is planning to upgrade part of state road A1 Gradsko – Prilep, which is a part of Pan-European Corridor X (E-75). There are three components to this programme:

1. Extension and upgrade to an expressway of the existing road from the Bridge over Leniska River to the entrance to Prilep;
2. Rehabilitation of the existing two lanes and an extension of existing road from Mavrovo Quarry to the junction with the Belovodica village road, to add one additional lane;
3. Construction of new expressway from the River Raec Bridge to Gradsko (junction with A1): ***The 'Project' described and discussed in this document is the construction and operation of the road section from the 'River Raec Bridge to the Drenovo Interchange' which is part of this component. The location of the Project on Corridor X is shown in Figure 1.***



4. — Corridor X — Corridor VIII ○ Planned Expressway Section

Figure 1 Location of Project on Corridor X

The European Bank for Reconstruction and Development (EBRD), in accordance with its Strategy for the Republic of Macedonia, is promoting regional transport integration and is supporting the development of strategic connections with neighbouring countries. This includes the upgrades of Corridors VIII and X. The EBRD are considering providing a loan for the expressway section River Raec Bridge to Drenovo Interchange (the 'Project' and 'Raec to Drenovo') which will be part of the state road A1 Gradsko – Prilep a branch of Corridor X (E-75). Further sections of the expressway between Raec River to Gradsko (i.e. onwards from the Drenovo Interchange to Gradsko) will be financed from other sources. The EBRD has determined that the Project is a *Category A Project* according its Environmental and Social Policy (ESP 2008), and is working with the PESR to ensure that the Project's environmental and social risks are appraised and managed in accordance with the Policy.

This Non-Technical Summary (NTS) describes the Project, and summarises the findings of the environmental and social investigations conducted and the risks identified. A Stakeholder Engagement Plan (SEP) has been developed for the Project describing the planned stakeholder consultation activities and engagement process. A Land Acquisition and Resettlement Framework (LARF) has also been developed to set out PESR's commitments to national and EBRD requirements in relation to land acquisition. An Environmental and Social Action Plan (ESAP) has been prepared in relation to the proposed Project; the purpose of the ESAP is to structure the future Project preparation activities to be in

¹ http://www.seetoint.org/wp-content/uploads/downloads/2014/01/FYRM_Transport-Strategy-2007-2017.pdf

line with EBRD's Environmental and Social Policy (ESP 2008). Full project preparation documents including the Environmental Impact Assessment (EIA), NTS, ESAP, SEP and LARF are included on the PESR website (<http://www.roads.org.mk/en/index.php>).

A **Sectoral Environmental Assessment**² was conducted in 2008 on the Regional and National Roads Programme. A **Strategic Environmental Assessment**³ was conducted in 2012 on the proposed development of the A1 expressway, and approved by the Ministry of Environment & Physical Planning (MOEPP). These were both publically disclosed and publically available. An **Environmental Impact Assessment** (EIA)⁴ was conducted under the requirements of the Republic of Macedonia, on the scheme to develop the road stretch from River Raec Bridge – Drenovo Interchange – Gradsko. This EIA covers the 'Project' currently under consideration by EBRD (Raec Bridge – Drenovo Interchange). The EIA was approved by MOEPP in March 2014.

The route of the A1 River Raec Bridge – Drenovo Interchange – Gradsko is presented in Figure 2 below. The 10.2 km section River Raec Bridge to Drenovo Interchange whose financing is being considered by EBRD is marked in pink. There is currently a state road (Prilep-Rosoman road (previously marked as R-106)) running along this section, this state road will be retained and the expressway River Raec Bridge to Drenovo Interchange will run along a similar corridor.

² available on request from PESR.

³ available on request from PESR.

⁴ Note – in Republic of Macedonia, the document is termed an 'EIA', whereas the term 'ESIA' is increasingly used internationally, and in EBRD's ESP. However, the EIA for the Project includes some description of the social context, and a discussion and mitigation of social impacts. Additionally, this NTS (together with the SEP and LARF) address social impacts.

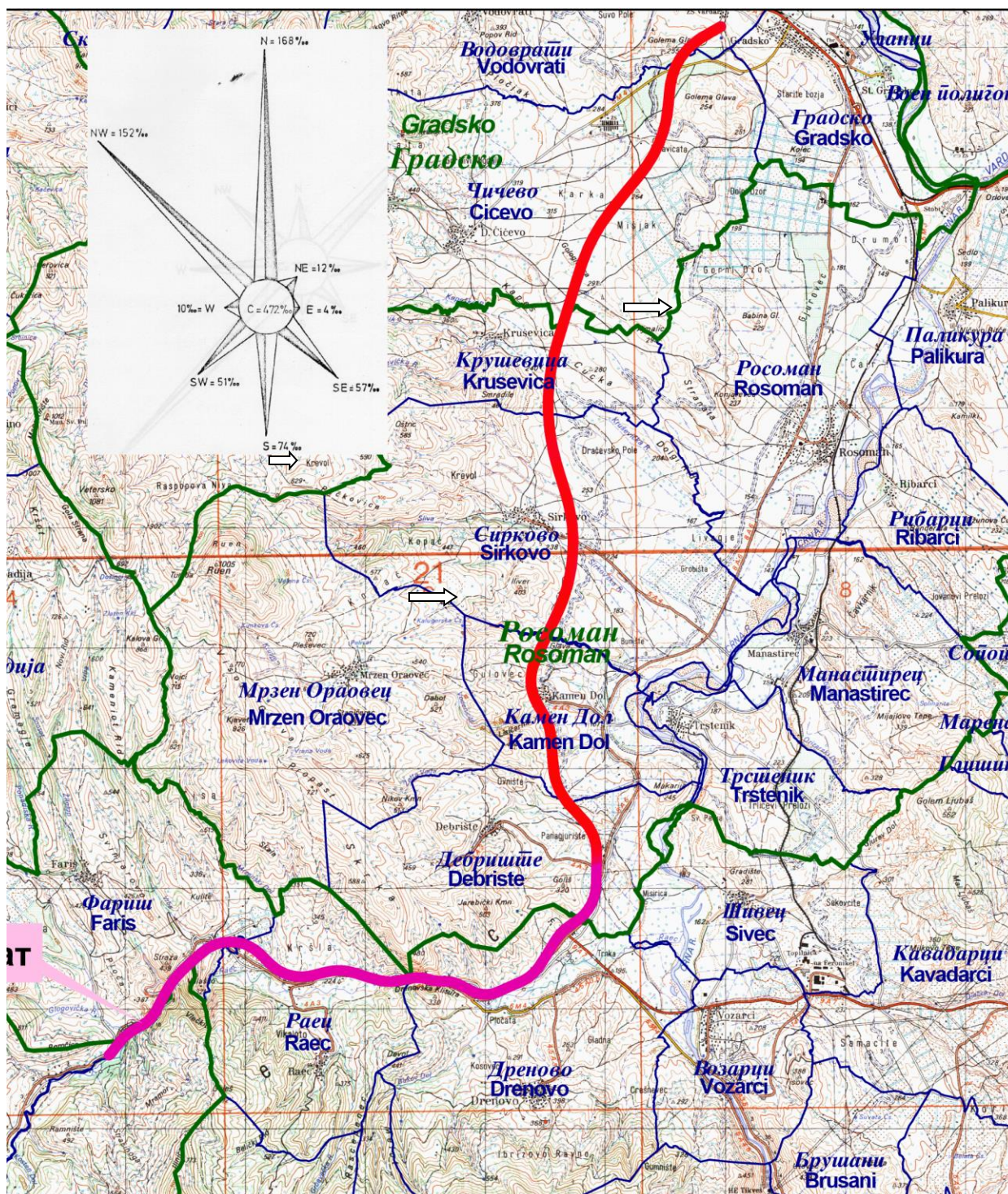


Figure 2 Alignment of the Planned Expressway River Raec Bridge to Drenovo Interchange to Gradsko - section potentially financed by the EBRD and section to be financed from other sources



2 BACKGROUND

2.1 RATIONALE FOR THE PROJECT

The Republic of Macedonia is aspiring for EU membership, and is engaged in the development of Macedonia's national road network in conjunction with plans adopted by the EU, such as the Trans-European Network Transport (TEN-T) network development plans up to 2020. EU transport development

plans call for the development and improvement of multimodal corridors to accept anticipated increases in transport (such as an anticipated increase in freight transport of more than 2/3 by 2020), and to reduce the density of traffic flows.

The major transport axes in Macedonia are shown in Figure 1 above. The network is linked to the Pan-European Corridors (Corridor VIII/east-west and Corridor X/north-south), and the Trans-European networks. The road section which this Project will upgrade is part of branch X-d of Corridor X which runs from Salzburg – Ljubljana – Zagreb – Belgrade – Nis – Skopje – Veles – Thessaloniki. This is also part of the western (secondary) development axis defined in the Macedonian National Spatial Plan. The development of this axis will connect the eastern and western parts of the country, and will improve cross-border links between Bulgaria and Greece, via the Kocani – Stip – Veles – Gradsko – Prilep corridor.

Part of the justification of the Project relates to traffic flows. The projected traffic flows for the year 2034 will exceed the threshold level for highways and expressways of national importance by 12%, which means that an improved road is necessary. In addition, an analysis of traffic flows and associated costs for the period 2015-2034 with and without the planned expressway shows that costs reduce significantly if an expressway is constructed.

In summary, it is estimated that the expressway will allow:

- a reduction in total operating costs incurred by drivers of 178 million EUR over the period;
- a reduction in the cost of travel time by 29 million EUR over the period;
- a reduction in the costs due to accidents of 2 million EUR over the period;
- a reduction in maintenance costs by 88,000 EUR over the period;

In addition, road safety will significantly improve.

2.2 PROJECT DEVELOPMENT & PLANNING HISTORY

The Republic of Macedonia Spatial Plan (2004) envisages construction of around 9,700 km of new roads by 2020. A high priority was assigned to the improvement of the western (secondary) transportation axis which extends from the border crossing with Bulgaria, through Drenovo, Kocani, Stip, Veles, Prilep and Bitola to the border crossing with Greece.

The National Transport Strategy (2007-2017) calls for completion of the Pan-European corridors passing through the country, and one of the short-term priorities is the improvement of the road connectivity and completion of the Corridor X (including its branch Xd). Following the framework set up in the Transport Strategy, the PESR placed a high priority to this project in its current five year programme.

The 145.6 km section from Veles to the border crossing with Greece at Medzitlija, is a particular priority. The need to connect Veles and Prilep and was identified in 2003 in the *Regional Balkans Infrastructure Study – Transport*, developed for the European Commission. Although the initial plan was to connect Veles and Prilep by a new two lane motorway, a feasibility analyses showed that the route from Veles to Gradsko should follow the Corridor X, with a new expressway only needed between Gradsko and the River Raec Bridge (see Figure 3). The remaining section to Prilep should also be rehabilitated and extended to become an expressway to the extent possible.

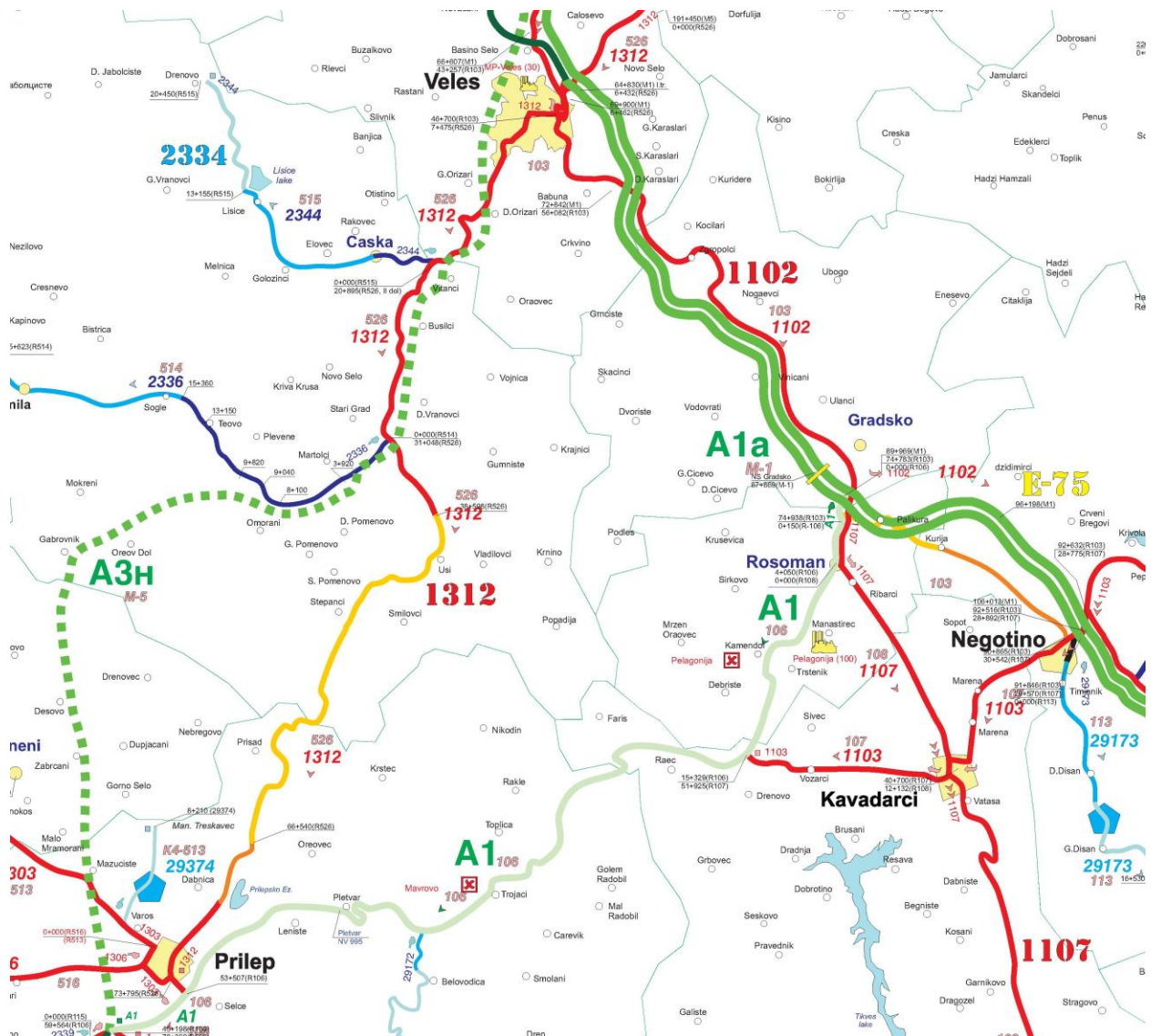


Figure 3 Existing Road Network between Veles-Gradska and Prilep.

2.3 ROUTE SELECTION & CONSIDERATION OF ALTERNATIVES

During the feasibility and conceptual planning stage, two alternative alignments through Drenovo Gorge were considered. Alternative 1 is aligned close to the existing Prilep – Gradsko road (A1), while Alternative 2 takes a more southerly line. Both alternatives lie entirely within the Raec Emerald Site. This is unavoidable, given that the entire existing road corridor (Prilep-Rosoman road (A1)) being upgraded lies within the Emerald Site (see Figure 13).

Both alternatives also enter into the Drenovo Gorge Protected Area, which is classed as a Monument of Nature and is protected under the Law of Nature Protection. Alternative 1 enters the Protected Area for a length of 3 km, while Alternative 2 infringes it for only 1.5 km. The route of Alternatives 1 and 2 are shown on the figure below, together with the existing road and the boundary of the Drenovo Gorge Protected Area.

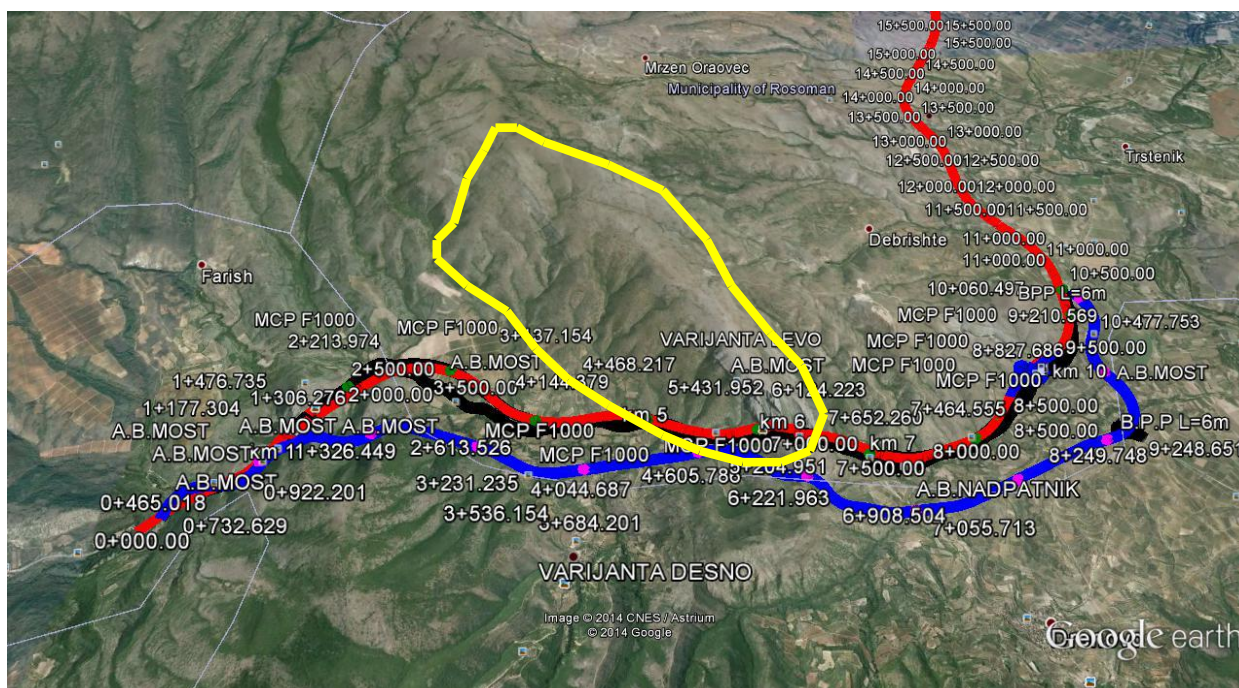


Figure 4 Alternative alignments and boundaries of the protected area Monument of Nature "Drenovo Gorge"

— Alternative 1
 — Existing Road
 — Alternative 2
 — Protected Area "Drenovo" Gorge

A multi-criteria analysis of alternatives was conducted. Both alignments cross the higher ground above the river gorges, and the technical difficulty associated with each is similar. However, Alternative 2 is longer, and has more longitudinal slope and a higher average curvature. A comparison of the technical difficulty associated with each alignment is given in the Table below.

Table 1 Comparison of Technical Difficulty for Alternative 1 and 2

| Data for the traffic road section: | Alternative 1 | Alternative 2 |
|---|------------------|------------------|
| length of the segment (km) | 10,197 km | 11.132 km |
| longitudinal slope (%) | 4.2 % | 5.0 % |
| average curvature (°/100 m) | 0.051 | 0.075 |
| total elevation - climb, descent (m/km) | 25/1000, 42/1000 | 47/1000, 50/1000 |

Source: Feasibility Study⁵

In the analysis, differences in operating and maintenance costs for both alternatives were calculated. Due to its length, larger average curvature and higher longitudinal slope, Alternative 2 was considered less safe than Alternative 1. Also, Alternative 2 approaches closer to the villages Raec and Drenovo than Alternative 1.

The relative environmental impacts were also considered. These included:

- Number of crossings over water courses;

⁵ Full title of the FS: Reconstruction of the existing road into expressway section Pilep (Iukoil petrol station) – Lenishka River Bridge; Reconstruction of the existing road Belovodica – quarry "Mavrovo" and adding a third lane; Bridge over Raec river – interchange "Drenovo"; and "Drenovo" interchange – north of Rosoman to the highway A1.

- Encroachment into Protected Area;
- Landscape changes (e.g. volume of cuts/fills and excess soil);
- Amount of agricultural land loss.

The multi-criteria assessment made use of a scoring system (1-3) as follows:

1. Greater technical difficulty; high operating costs, a great number of crossings over water courses, significant landscape changes, loss of valuable agricultural land
2. Moderate technical difficulty, operating costs, number of crossings over water courses, landscape changes, and loss of valuable agricultural land
3. Low technical difficulty, operating costs, number of crossings over water courses, loss of valuable agricultural land.

The results of the multi-criteria analyses are summarised in the table below:

Table 2 Evaluation of Alternative 1 and 2

| Alternative route | Technical Difficulty (1-3) | Operating Costs (1-3) | Number of crossings over water courses (1-3) | Length of encroachment in protected areas | Landscape Disturbance (1-3) | Loss of agricultural land (1-3) | Total Score |
|-------------------|----------------------------|-----------------------|--|---|-----------------------------|---------------------------------|-------------|
| Alternative 1 | 2 | 2 | 2 | 1 | 2 | 1 | 10 |
| Alternative 2 | 1 | 1 | 1 | 2 | 1 | 2 | 8 |

Alternative 1 had a higher overall technical score and was therefore selected.

Subsequent to the alternatives analysis, further baseline information has been collected and surveys on the habitats and species in the area have been carried out. These have identified certain natural habitats and potential critical habitats that were not explicitly considered in the route selection. Therefore PESR will conduct a **Critical Habitats Assessment (CHA)** on the scheme, see Section 7.3.

As part of this CHA, PESR will provide an updated discussion on assessment of the alternative routes from a biodiversity perspective. In particular, the alternatives assessment will examine why it was not feasible to avoid the following areas:

- Drenovo Gorge Protected Area (including Endemic snail (*Carinigera drenovoensis*) habitats; and Chasmophyte vegetation focusing on the relict fern communities (*Adiantum capillus-veneris*, *Molinia caerulea*, *Stachys Iva*, etc; and nesting and foraging areas of Egyptian Vulture);
- Annex I Priority Habitat: dry grass pseudo steppes in the route alignment;

Where potentially ecologically superior alternatives considered not feasible, the reasoning and justification will be clearly explained in the CHA. The CHA will be publically disclosed when completed.

With regard to the Raec Emerald Site, the road follows the existing road corridor which follows the valley of the Raec River, through the centre of the Emerald Site (see Figure 13 below). The overall route alignment, including the section from the Bridge over River Raec to Interchange Drenovo, was conditioned to meet the existing start/end points of the wider transport network, taking into account the morphology of the terrain. The selected route was aligned, to the extent possible, in parallel with the existing road A1 which crosses through the Emerald Site. Thus this road scheme by definition will run through the Emerald Site with no possibility of an alternative which connects its start and end points. This will be documented again as part of the CHA based on currently available information.

3 PROJECT DESCRIPTION

The Project will include several phases of implementation: design, construction, and operation. At the time of publication of this NTS (May 2014), the Project is in the final design stage. The next stage will include land acquisition and development of the tender documents for contracting. It is intended that construction will commence in April 2015 with an anticipated 2 year construction period, meaning that the road should be operational by summer 2017.

This EIA conducted covers all the phases of the project. Since this new road is a strategic component of the Republic of Macedonia's roads network, a decommissioning phase had not been considered or assessed. Any future decommissioning of the road will require a detailed decommissioning plan which sets out commitments on removal and disposal of infrastructure components, restoration of topsoil and vegetation, and the rehabilitation of the landscape.

3.1 SUB-SECTION RAEC TO DRENOVO

The stretch of the expressway constituting this Project runs from River Raec Bridge to Drenovo Interchange and is 10.2 km long. The design speed is 100 km/h (and 80 km/h through the short tunnel section). Generally the road will consist of two lanes (one in each direction), each of 3.5 m width, and having a verge of 2.5 m width. In this case, the total width of the corridor would be 12.4 m. There are three road stretches that will differ from this, as follows:

- For two short sections, (one which is 2.42 km long and one 1.3 km long), the road will consist of four lanes (two in each direction), each of which will be 3.5 m wide, and having a central reservation of 1.8 m width. The total width of these sections will be 17 m;
- There will also be a short section of highway (1 km long) which has a total width of 25.4 m. This stretch will have four lanes (two in each direction, each being 3.5 m wide), with a verge of 2,5 m width and a central reservation of 8,8 m width.

The alignment for this road section takes into account the morphology of the terrain and the requirement to separate the new expressway from the existing Prilep-Rosoman road (A1), as well as the design speed, the width of the expressway, and the longitudinal slope.

Because of the geographical and morphological features of the area along the alignment, the expressway is divided into two sub-sections:

- **Faris Gorge Section** – a 5.2 km stretch. At the end of this sub-section the planned expressway intersects with the existing road A1 (R-106): an appropriate junction has been designed to allow for concurrent functioning of both motorways.
- **Drenovo Gorge Section** – a 5.0 km. Around 0.4 km from the end of this section, a junction with the existing road R1103 (R-107) to Kavadarci will begin, which extends into the Drenovo Interchange.

The following figure illustrates the road alignment and the sub-sections of the route crossing the Faris and Drenovo Gorges.

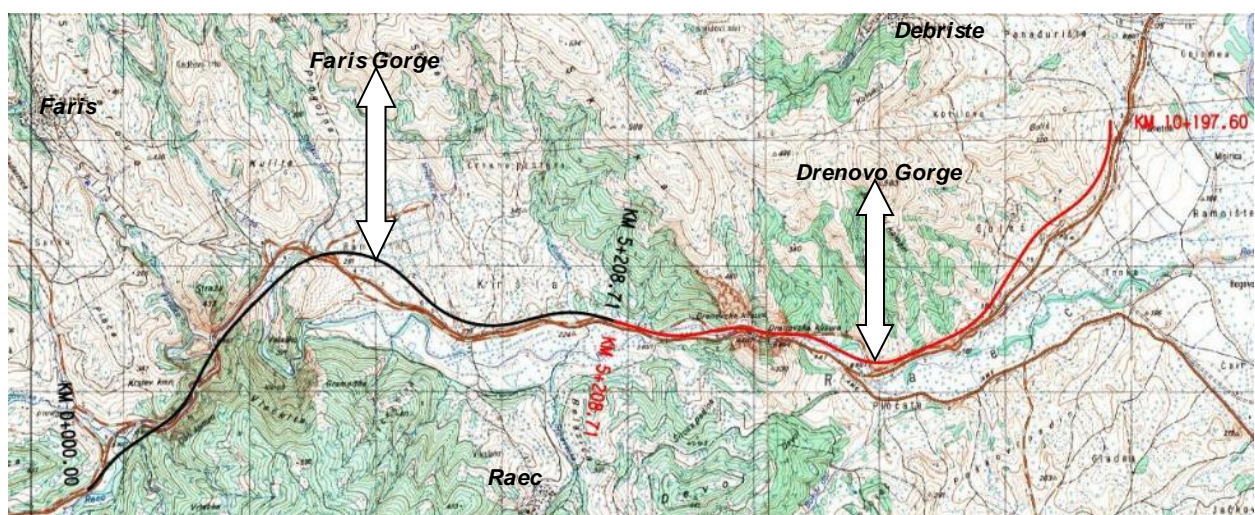


Figure 5 Alignment - Bridge over River Raec - "Drenovo" interchange: sub-sections crossing Faris and Drenovo Gorges

The Project design had to address significant constraints on the horizontal and vertical alignment, due to the narrow river valley created by the River Raec. Because of this, the route mostly lies on the left bank (i.e. the north side) of the river. Also due to the complex morphology, the amount of cut and fill will be substantial. Support walls will be required to stabilise the higher cuts at six locations. These will be installed at the following chainages; 1+553 km. 1+628 - 2+066, km. 6+057, km. 6+593, km. 9+121 and km. 9+938.

There will be a short tunnel needed at chainage 0+631. The north lane will be 159 m long, and the south lane will be 139 m. This will be a standard reinforced concrete structure, created by cut-and-cover, and is needed to take the road through an elevated section of land. The total internal width of each carriageway will be 7.6 m, consisting of two 3.5 m wide lanes and two kerbs of 0.3 m each.

For the section through Faris Gorge, over 369 Mm³ of material will be excavated, and over 253 Mm³ of fill material will be placed in the embankments. The excess soil (over 116 Mm³) will be deposited at approved sites in the area. There will be one deposit for excess soil located at around 2.5 km from the western end of the road development.

For the section through Drenovo Gorge, over 408 Mm³ will be excavated and over 201 Mm³ will be filled into the embankments. The excess soil (over 292 Mm³) will be deposited at approved spoil sites on state owned land. The total quantity of excess soil is estimated at over 408 Mm³. Two spoil piles are planned (at chainages 5+750 and 9+000 km) on lands not subject to flooding or soil erosion. The first two spoils will be created on non-productive land, although the third will require some removal of bushes and trees. The removed vegetation will be either offered to the local population (i.e. inhabitants of Debriste village), or will be re-planted under the supervision of a biologist to be hired during the construction of the expressway.

The proposed locations of the spoil piles are shown below.

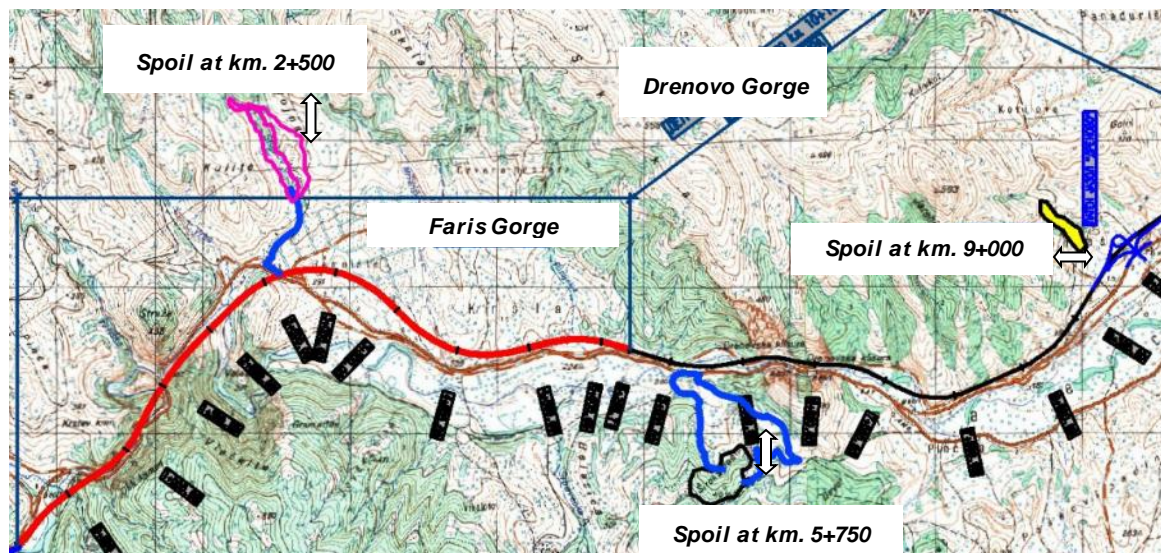


Figure 6 Locations of deposits for excess soil for sub-sections Faris and Drenovo Gorge

An Environmental Study on the selected deposit sites was conducted and approved by the Ministry of Environment and Physical Planning. No further permits will be needed in relation to these, apart from the construction permit for the expressway as a whole.

Existing borrow pits will be used to obtain aggregate for the construction of the road, although it is possible that some new borrow pits will be required. If so, the locations will be selected by the Contractor. Approvals for new borrow pits will be applied for in line with the Law on Mineral Resources, which stipulates the need to conduct a short environmental assessment for both the geological investigation stage, and the extraction of aggregate.

To ensure for the continuity of existing local roads, four underpasses are planned. These will be located at chainages 0+490 km, 2+605 km (intersection with the existing road Prilep-Gradsko R-6), 9+121 km and finally 10+128 km (which is the Drenovo Interchange, enabling connection with Debriste and Kavadarci villages).

In addition, the new road will pass at a higher elevation over five existing roads without intersecting with them. These existing roads are used by farmers to access their plots and will be avoided by extending the bridges which need to be constructed over the local watercourses. This will occur at chainages 5+560 km, 3+860 km, 7+540 km, 7+870 km and 8+420 km. This infrastructure allow for continuity of the existing local roads.

Five bridges will be built over the River Raec and other local watercourses. These will be constructed at chainages 0+400 - 0+490 km, 0+744 - 1+482 km, 2+184 - 2+605 km, 5+575 - 6+057 km and 7+014 - 7+223 km. The following figure shows the location of these various elements - tunnel, bridges,

underpasses, culverts and support walls. Each element is marked with a code which is referenced in the table below.

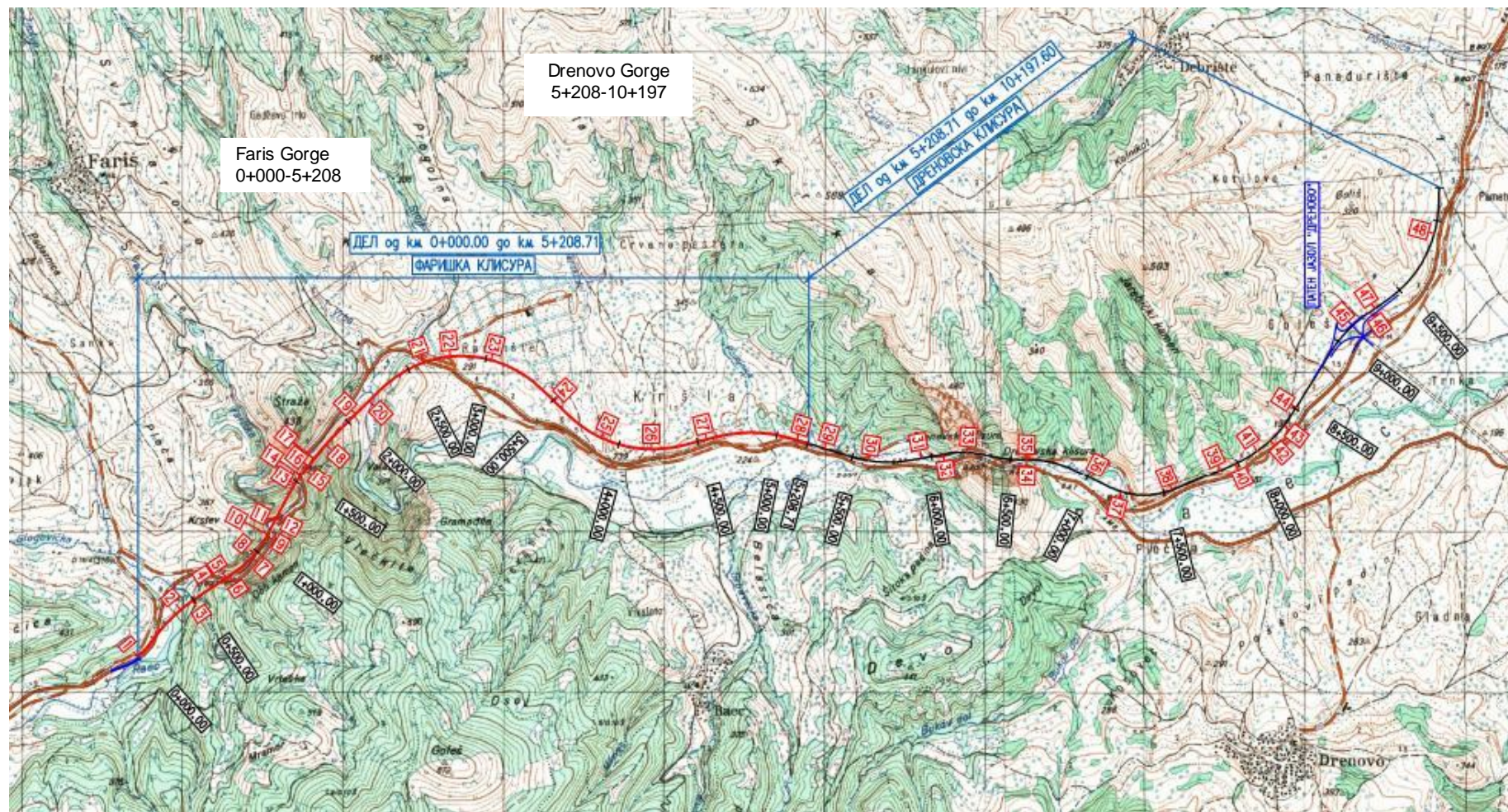


Table 3 Legend of Codes Assigned to Expressway Elements

| No. | Road element | No. | Road Element | No. | Road Element | No. | Road Element |
|-----|----------------|-----|--------------|-----|--------------|-----|--------------|
| 1 | Support Wall | 11 | Bridge | 25 | Viaduct | 37 | Bridge |
| 2 | Bridge | 12 | Bridge | 26 | Culvert | 38 | Culvert |
| 3 | Underpass | 13 | Bridge | 27 | Culvert | 39 | Culvert |
| 4 | Tunnel | 13a | Bridge | 28 | Culvert | 40 | Culvert |
| 5 | Bridge | 14 | Support Wall | 29 | Culvert | 41 | Culvert |
| 6 | Bridge | 15 | Gallery | 30 | Bridge | 42 | Culvert |
| 6a | Construction 1 | 16 | Support Wall | 30a | Bridge | 43 | Culvert |
| 6b | Construction 2 | 17 | Support Wall | 30b | Bridge | 44 | Culvert |
| 6v | Construction 3 | 18 | Support Wall | 31 | Bridge | 45 | Underpass |
| 7 | Bridge | 19 | Support Wall | 31a | Bridge | 46 | Support Wall |
| 8 | Construction 4 | 20 | Bridge | 32 | Support Wall | 47 | Underpass |
| 8a | Construction 5 | 21 | Underpass | 33 | Bridge | 48 | Culvert |
| 8b | Construction 6 | 22 | Culvert | 34 | Support Wall | 48a | Support Wall |
| 9 | Bridge | 23 | Culvert | 35 | Culvert | 48b | Underpass |
| 10 | Bridge | 24 | Culvert | 36 | Bridge | | |

Fifteen canals and culverts will be placed along the planned expressway to allow passage of water courses. They will be located at the following chainages: 2+776 km, 3+029 km, 3+506 km, 4+205 km, 4+557 km, 5+129 km, 5+308 km, 7+543 km, 7+871 km, 7+974 km, 8+132 km, 8+238 km, 8+353 km, 8+499 km, and 9+910 km. The size and design flow of each was determined by estimating and modelling the flow and catchment characteristics of each water course. The main catchments and watercourses in the Project area are shown on the figure below.

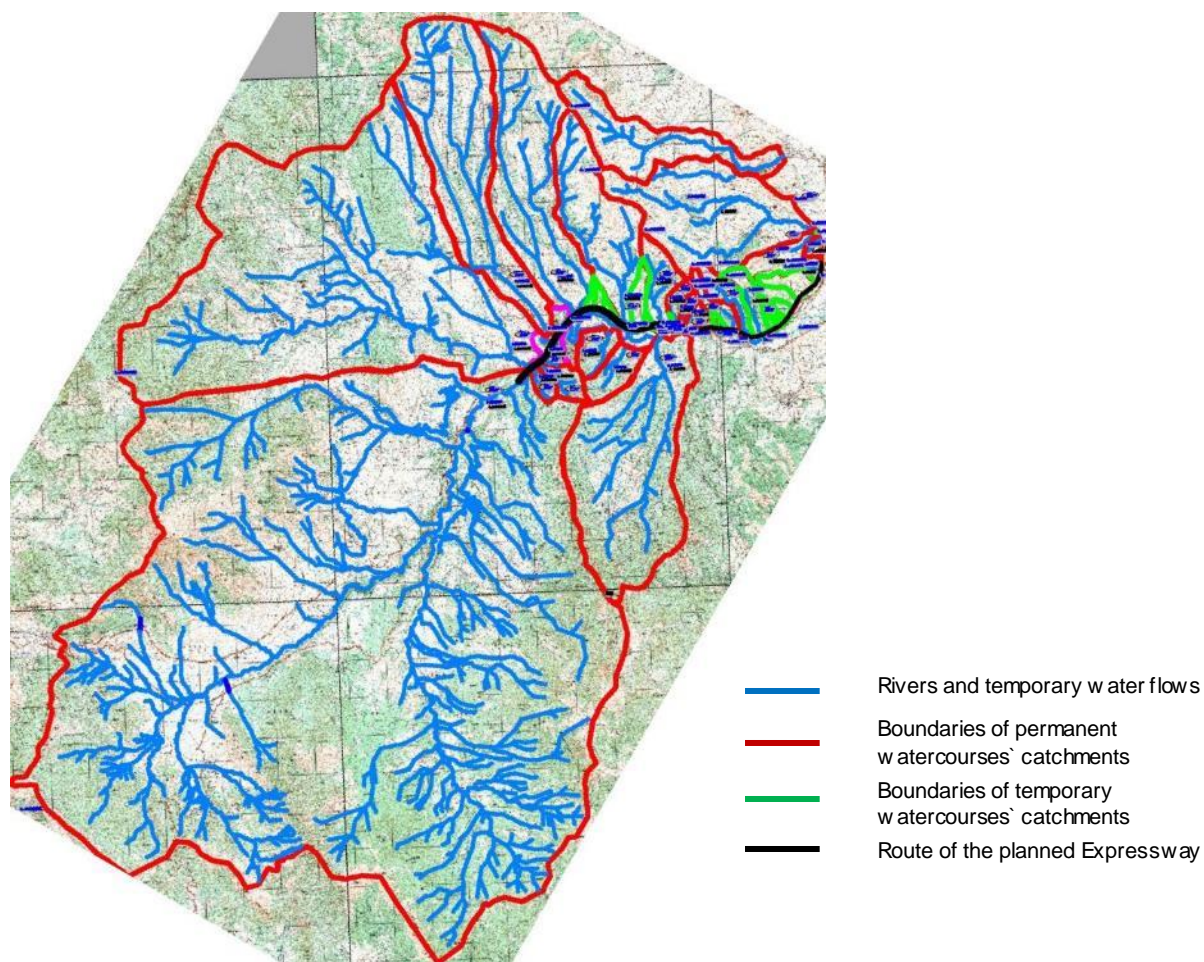


Figure 8 Water Courses and Boundaries of Catchments in the Project Area

Hydrographical and hydrological analyses have been conducted for the River Raec and its tributaries in the catchment of the proposed road section. Flood modelling has been carried out for the 50, 100 and 1000 year floods. The alignment of the expressway is set above the 1000 year flood line, to reduce flood risk.

A longitudinal storm water drainage system will be installed along the road surface. Oil interceptors will be installed at points where the wastewater will be discharged to the ground. The location of the oil traps are shown in the figure below.

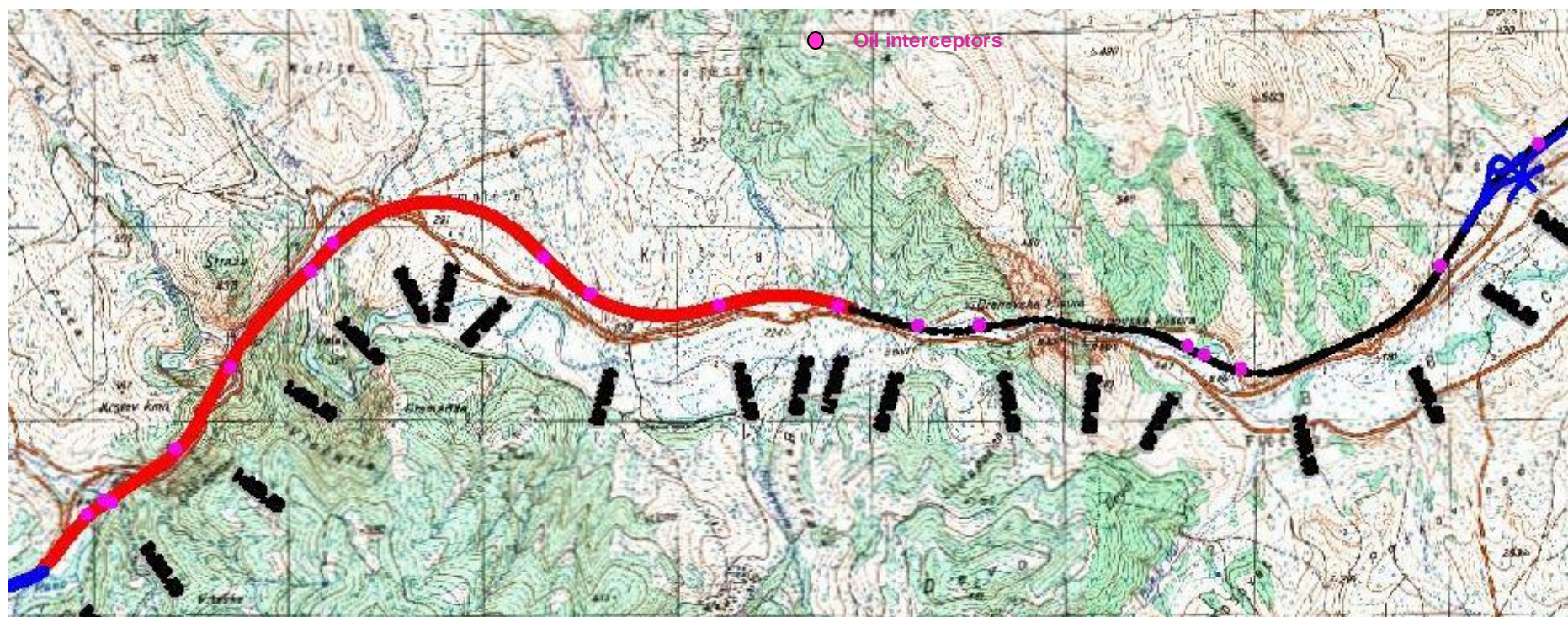


Figure 9 Locations of Oil Interceptors

3.2 CONSTRUCTION OF THE EXPRESSWAY

The construction schedule shall include the following activities:

- (i) Site Establishment Works: clearance of vegetation; stripping and stockpiling of topsoil; construction of temporary access roads to facilitate excavations for shaping the major cuts; establishment of the construction camp and storage compounds as well as vehicle and equipment maintenance areas; stockpiling aggregate and allocating routes for heavy truck movements;
- (ii) Construction of Major Road Elements: bridges and culverts, underpasses and the Drenovo interchange, appropriate traffic management and sediment control; erection of fences;
- (iii) Construction of the Motorway: shaping cuts (including blasting activities), construction of embankments, shaping of slopes, execution of bonding layer, execution of the upper wearing course;
- (iv) Site Remediation: removal of redundant erosion and sedimentation controls and landscaping (including hydro-mulching and seeding of cuts/fills; establishing fast growing cover crops on leftover spoil areas).

For the construction, the following materials will be used: gravel, geo-composite, concrete, reinforcement and zinc - plated net, plant seeds and topsoil. 51,617 m³ of topsoil will be removed, and an additional 21,144 m³ of topsoil will be needed for re-vegetation of slopes. The removed topsoil shall be preserved so it can be used for re-vegetation. The fill, the sub-base and the base will be made of gravel obtained from the cuts, while an additional 53,389 m³ of gravel will be supplied and spread for the binder course.

Due to the site limitations, if any construction camps are needed, they will be established at either end of the route only, and not in the river corridor. There will be at least one Construction Site Manager, Site Engineer and Site Supervisor employed and approximately 40-60 workers will work on the construction of the expressway. The workforce will be managed in accordance with the Macedonian labour laws and health and safety regulations. The majority of labourers are likely to come from local villages. The total construction phase will take around two years. At present, construction is planned to begin in April 2015.

4 SUMMARY OF ENVIRONMENTAL & SOCIAL LEGAL AND POLICY FRAMEWORK

4.1 NATIONAL LEGAL FRAMEWORK FOR ENVIRONMENTAL AND SOCIAL PROTECTION

The environmental legal framework is defined by the Law on Environment (OGRM No. 53/05, 81/05, 24/07, 159/08, 83/09, 123/12, 93/13, 187/13 and 42/14). This Law transposes the requirements of various EU requirements, including those of Directive 2003/35/EC⁶; Council Directive 96/61/EC⁷; Directive 2001/42/EC⁸; and Council Directive 82/501/EEC⁹. The provisions for assessment of the effects of certain public and private projects on the environment (i.e. the EIA Directive, 85/337/EEC) are transposed in Chapter XI.

With regards to social aspects, national laws exist which cover Health Protection, Occupational Health & Safety, Labour Relations, Working Conditions, Employment, Wages, Social Protection, Land Acquisition, Child Protection and Equal Opportunities. The Republic of Macedonia has ratified many International Labour Organisation (ILO) Conventions.

The following laws are of particular interest for the implementation of the Project: Law on Public Roads ("Official Gazette of RM" No. 84/08; 52/09; 114/09; 23/11, 168/12), Law on Road Safety ("Official Gazette of RM" No. 54/07; 86/08; 98/08; 64/09), Law on Health and Safety ("Official Gazette of RM" No. 92/07, 136/11, 23/13, 25/13) and Law on Fire Prevention ("Official Gazette of RM" No. 67/04, 81/07).

Several international environmental and social treaties and conventions are relevant and are listed below:

- Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.

⁶ Directive 2003/35/EC of the European Parliament and Council providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment and amending with regard to public participation and access to justice Council Directives 85/337/EEC and 96/61/EC

⁷ Council Directive 96/61/EC concerning integrated pollution prevention and control;

⁸ Directive 2001/42/EC of the European Parliament and of the Council on the assessment of the effects of certain plans and programmes on the environment;

⁹ Council Directive 82/501/EEC on the major-accident hazards of certain industrial activities.

- Espoo Convention: EIA in a Transboundary Context: UNECE;
- Convention on Biological Diversity (CBD).
- Berne Convention on the Conservation of European Wildlife and Natural Habitat.
- Bonn Convention: Conservation of Migratory Species of Wild Animals;
- Convention on Wetlands of International Importance;
- Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES);
- European Landscape Convention.

4.2 SUMMARY OF EIA & PERMITTING PROCESS

The overall EIA process is regulated by the Law on Environment and several secondary regulations that define the screening and scoping process, the EIA content, the procedure for its evaluation and disclosure as well as adoption / rejection.

Macedonian Law on Environment (Article 77) explicitly requires the undertaking of an Environmental Assessment on the possible environmental impacts of public and private projects that could significantly impact the environment. This must be conducted and approved before a construction permit is granted.

Under Annex 1, Item 7 (Motorways) of the 'Decree Determining the Projects and the Criteria under which the Requirement for Environmental Impact Assessment Procedure Performance is Established' (Official Gazette of RM no74/05), an EIA is mandatory for a road project such as the River Raec Bridge – Drenovo Interchange.

The overall length of the EIA procedure according to the Macedonian Law is a minimum of 105 days, which includes the following steps:

- Publish the EIA within 5 days after the submission of the draft EIA to the MoEPP;
- Hold a public review and consultation within 30 days after the submission of the EIA;
- Prepare an Adequacy Report within 60 days after the submission of the EIA;
- Issue a Decision on adoption/rejection of the EIA within 40 days after the completion of the Adequacy Report.

The Project is a Category I Construction Project according to the Law on Construction (O.G. No. 130/2009, 70/13 and 42/14), and the national responsible body for issuing the construction permit for this category of projects is the Ministry of Transport and Communication (MoTC).

Additionally, according to the EBRD Environmental and Social Policy (2008), the Project is a Category A project, and EBRD requires an Environmental and Social Impact Assessment (ESIA) to be prepared.

4.3 LEGAL FRAMEWORK FOR NATURE PROTECTION

National Requirements

The legal basis for nature protection in the Republic of Macedonia is contained within the Constitution, the Law on Nature Protection (O.G. Nos. 67/04, 14/06 and 84/07, 93/2013, 187/2013, and 42/2014), the Law on Environment, and in international agreements signed or ratified by the Country and other laws regulating the use of certain natural resources.

The Law on Nature Protection sets out principles of protection, restrictions regarding use of nature and natural resources, impact assessment, planning, compensation measures, protection of biodiversity, protection of internationally important species, wildlife conservation, genetic diversity, habitats and ecosystems, ecological networks, minimum environmental release¹⁰, restrictions for construction activities in riparian habitats and littoral areas, restriction of fishing in certain conditions, protected areas, management plans for protected areas, rangers, landscape diversity, organisation of nature protection including management of protected areas, financing inspection and supervision, penalties and final and transitional provisions. The law transposes the following Directives: Council Directive 92/43/EEC¹¹, Council Directive 79/409/EEC¹², Council Regulation (EC) No 338/97¹³ etc. The full transposition of the

¹⁰ Reference is made to the Law on water which needs to set a methodology for minimum environmental release.

¹¹ Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora

¹² Council Directive 79/409/EEC on the conservation of wild birds

Habitats Directive (92/43/EEC) and the Wild Birds Directive (79/409/EEC) is pending. Obligations arising from Article 6 of the Habitats Directive on the assessment of projects significantly affecting Natura 2000 sites are yet to be implemented in the national legislation.

The Law provides a good framework for developing a network of protected areas in line with the IUCN categorisation. In Article 53, it stipulates the establishment of a coherent ecological network. The obligation to set a national ecological network, (as part of the Pan-European Ecological Network - PEEN) derives from the fact that Macedonia is a signatory party of the Pan - European Biological and Landscape Diversity Strategy (PEBLDS, 1996).

To promote the system of protected areas, the Republic of Macedonia initiated the development of the EMERALD network comprising of areas of special interest for conservation (ASCI) in line with the Berne Convention on the Conservation of European Wildlife and Natural Habitat, more specifically, its Resolutions No.4 (1996) and 6 (1998). Of the total number of 187 endangered habitats requiring special conservation measures listed in Resolution No. 4 (1996), 32 have been found in Macedonia. Of the total number of 927 species requiring special habitat conservation measures according to the Resolution No. 6 (1998), 167 are present in Macedonia. Within the period 2002-2008 35 sites were identified, described and submitted to the Secretariat of the Bern Convention.

For the sake of compatibility between the Emerald Network and Natura 2000, Emerald sites are categorised into three different types:

- Type A (Areas important for the protection of birds, which are in accordance with the Special Protection Areas (SPAs) of Natura 2000);
- Type B (Areas important for other species and/or habitats, which are in accordance with the Special Areas for Conservation (SACs) of Natura 2000);
- Type C: Areas important for birds, other species and/or habitats.

The development of the Emerald Network is considered an important preparatory activity for the establishment of the Natura 2000 network and thus compliance with the Habitats Directive (92/43/EEC) and the Wild Birds Directive (79/409/EEC).

The Law on Nature Protection establishes a system of protected areas. This includes the category of 'Natural Monument' (or Monument of Nature'). Drenovo Gorge falls under this category. Art. 76 of the Law on Nature Protection defines the category of Natural Monument as a '*part of nature with one or more natural characteristics and specific, threatened or rare features, characteristics or forms, and have special scientific, cultural, educational and spiritual, aesthetic and/or tourist value and function*'. Under Art 76, undertaking activities in or near Natural Monuments that may endanger their particular natural features and the values for which they have been designated as a Natural Monument, is not to be allowed.

EBRD Requirements

The protection and conservation of biodiversity in the context of projects in which it invests is widely recognised in EBRD's Environmental and Social Policy. EBRD supports a precautionary approach to the conservation and sustainable use of biodiversity through the implementation of applicable international laws and conventions and relevant EU Directives. Guidelines addressing this approach which this Project must meet the requirements of are provided in EBRD's Performance Requirement 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

4.4 LEGAL FRAMEWORK FOR LAND ACQUISITION

Land tenure and property rights are regulated by the Law on Property Cadastre (O.G. Nos. 40/08, 158/10, 51/11); the Law on Survey and Land Cadastre (O.G. Nos. 34/72, 13/78); and the Law on Ownership and Other Material Rights (O.G. Nos. 18/01).

The Law on Expropriation (O.G. Nos. 33/95, 20/98, 40/99, 31/03, 46/05, 10/08, 106/08 & 76/10 and 95/12) regulates the acquisition of property and real estate (immovable properties) required for the implementation of projects of public interest. *Public interest* is defined in various levels of spatial and urban planning documents. The implementation of the planned expressway is considered to be in the public interest.

According to the law, the project developer submits expropriation proposals to the Local/ Regional Offices of Property Administration. Eight days from the submission of the expropriation proposal, the

¹³ Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein

Local/Regional Offices of Property Administration shall invite the owners, carriers of property rights over the real estate and the developer for negotiations, in order to determine the nature and amount of the compensation, etc. The price offered for land is calculated based on a methodology announced in the Official Gazette of the Republic of Macedonia that takes into account the market value of the affected property, and based on the quality of soil, proximity to irrigation facilities, availability of water, etc. Owners may receive market-price based compensation for trees, seedlings, crops and forests etc. The compensation price is determined with the help of qualified property assessment experts.

The Law provides scope for appeal against the decision for expropriation. Consultations continue until agreement is reached. If the concerned parties cannot agree, appeals are made to the relevant Court of Justice regarding the amount of compensation and date of expropriation. The Project proponent shall acquire the tenure right over the expropriated real estate 15 days after the date of the decision.

EBRD Requirements

Land acquisition for the Project shall be undertaken in line with EBRD's Environmental and Social Policy (2008), Performance Requirement (PR) 5, which covers Involuntary Resettlement and Economic Displacement. According to PR5, not only those who have legal title are entitled for compensation, but also those who do not have legal rights that are directly affected by the Project. PR5 also requires a process of open and transparent negotiation to take place even before the expropriation proceedings begin, to ensure that the final agreed price corresponds to the EBRD requirement of "replacement value" enabling the project affected person to purchase land of similar quantity and quality.

PR5 contains the following four key objectives for land acquisition and involuntary resettlement, which are applicable to this Project:

- All feasible alternative project designs should be explored to avoid or at least minimise physical and/or economic displacement, while balancing environmental, social and financial costs and benefits;
- Adverse social and economic impacts from land acquisition or restrictions on affected persons' use of and access to land should be mitigated by: (i) providing compensation for loss of assets at replacement cost; and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and informed participation of those affected;
- To improve or, at a minimum, restore the livelihoods and standards of living of displaced persons and standards of living of displaced persons to pre-project levels, through measures that can be wage-based and/or enterprise-based, so as to facilitate sustainable improvements to their socio-economic status;
- To improve living conditions among displaced persons through provision of adequate housing with security of tenure at resettlement sites.

5 PROJECT EIA, STAKEHOLDER ENGAGEMENT & LAND ACQUISITION PROCESS

The environmental considerations have been integrated in the overall project preparation process through implementing a Strategic Environmental Assessment (SEA), and an Environmental and Social Impact Assessment (EIA). Both the SEA and EIA have been conducted, and approved. All required public hearings on the SEA and EIA were held, and public disclosure of the SEA and EIA has been held in accordance with the Law.

5.1 STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) PROCESS

The SEA was conducted in the initial project preparation phase and covered the development of the Urban Plan for Infrastructure which included three sections of the road from Prilep to Gradsko (Bridge over River Leniska to Prilep; Mavrovo Quarry to junction with the road to Belovodica; and Bridge over River Raec to Gradsko). The SEA process comprised of: screening and scoping, setting environmental objectives and targets, developing the draft SEA Report. The draft SEA Report was published and disclosed for public consultation in September 2012. A public consultation was held on 10th October 2012 to present and discuss the Draft SEA Report. Comments were received for the section from Drenovo Interchange to junction with highway A1 north from Gradsko related to the conversion of vineyards in the corridor for construction of the expressway. For the section River Raec Bridge to Drenovo Interchange, no comments were received. On 26th November 2012, the Final SEA report was submitted to the MoEPP. MoEPP published a positive opinion on 6th December 2012.

5.2 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PROCESS

The EIA process began with a submission by PESR to MOPP on 20th March 2013 of a Notification of intent to develop the project. This was published on the MoEPP website. The Notification contained a scoping checklist which was developed from preliminary assessment of environmental impacts and alternatives analysis. The Notification was circulated internally to various departments of the MoEPP, including the Department on Nature Protection. No major concerns were raised for the alternative alignments passing through the protected area 'Drenovo Gorge' and 'Emerald Site Raec'. The screening and scoping process was completed by the MoEPP, which issued a Decision (on 20th May 2013) to implement a full EIA process, to a specified scope.

The EIA process complemented both the conceptual and basic design processes. During the conceptual stage, a multi-criteria analyses was developed which contributed to integrating the environmental concerns into the selection of the route from the two proposed alternative alignments. After the route selection, the EIA focused on the assessment of impacts based on the expressway elements defined in the Project design.

On 15th July 2013, the final draft of the EIA Study was submitted to the relevant department within MoEPP. The MoEPP published the EIA on its website, and within 5 working days, supplied it to the local Municipalities of Kavadarci, Rosoman and Gradsko for publishing on their respective websites. It was disclosed to the public for review, comments and participation. On 12th September 2013, a public debate was held on the EIA Study which resulted in no major comments, and no major changes required. The MoEPP issued a Report on the Adequacy of the EIA on 3rd March 2014, and a Decision to approve the undertaking of the Project was issued on 21st March 2014. This final decision on to grant consent for the Project was made by the MoEPP and publicly disclosed. The decision was published in two daily newspapers available throughout the territory of the Republic of Macedonia, and on the web site and the notice board of the MoEPP.

The approval of the EIA by MoEPP is taken as the approval for the development of the Project sections within the Drenovo Gorge and Emerald Raec site. If any additional approvals or licences are necessary under the Law on Nature Protection, these will be sought by PESR.

5.3 STAKEHOLDER ENGAGEMENT

A Stakeholder Engagement Plan (SEP) has been prepared to identify the key project stakeholders and define relevant procedures. Stakeholder engagement will be implemented as an ongoing process involving the public disclosure of appropriate information so as to enable meaningful consultation with stakeholders and potentially affected parties who can raise their comments or complaints in line with the procedures set in the SEP. In their complaints, the stakeholders may use legal assistance provided by the Macedonian legislation.

During the development of the EIA, affected stakeholders and interested parties were carefully identified (particularly vulnerable stakeholders whose lives and wellbeing may be affected by the Project), and their concerns, expectations and preferences were taken into consideration. These include: 980 inhabitants of the villages Faris, Raec, Drenovo, Dobriste and Golem Radobil; three legal persons owning land within the corridor of the expressway; Civil Society Organisations; local entrepreneurs and the business community. Other interested parties include the project developer (PESR), the Contractor, Supervisor as well as the environmental authorities in charge of monitoring the implementation of the mitigation and compensation measures defined in the EIA.

The stakeholder engagement process began at the earliest stage of project planning when official correspondence was held with relevant institutions. In 2012, MEPSO, the electricity transmission system operator in R. Macedonia, was contacted to determine connectivity to the electricity network and potential intersection with existing power lines. The Ministry of Agriculture, Forestry and Water Economy was also consulted in 2012 regarding the anticipated conversion of some agricultural land into construction land. In July 2012, a request was made to the Ministry of Culture to propose appropriate technical measures to conserve a World War I monument located in the vicinity of the planned route. Contacts were also established with the Public Utility for Water Economy "Tikvesh-Kavadarci" to consult on the crossings of the expressway route over irrigated agricultural land.

Additionally, close interaction with the local communities was maintained in order to identify opportunities for improving the social performance of the Project during informal visits to the area by the PESR staff, and their planning, design and engineering consultants "PROSTOR", including for data collection and surveying of the alignment.

The SEP sets a schedule for future stakeholder engagement as follows:

- Public disclosure of this Non-Technical Summary, the EIA, SEP and LARF in May 2014 for a duration of 120 days; and
- Land acquisition process (including initial consultations and negotiations) to take place in May-June 2014.

The PESR will implement a grievance mechanism in line with the SEP. The PESR is committed to respond to all comments and complaints, either verbally or in writing. In the SEP, the following contact point for grievances has been given;

Mrs Biljana Todorova, Department for Legal Affairs
 Tel: + 389 (0)2 3118-044 ext.119
 Fax: + 389 (0)2 3220-535
 e-mail: biljanal@roads.org.mk
 Address: Public Enterprise for State Roads
 Dame Gruev 14, 1000 Skopje, Republic of Macedonia Web: www.roads.org.mk

A written form for submission of complaints has been developed for the general public and workers. A worker's grievance mechanism will also be established for the employees of construction companies.

PESR will respond to every complaint, and will monitor implementation of the grievance mechanism and draft appropriate reports which will be made publicly available on its website.

5.4 LAND ACQUISITION & RESETTLEMENT PLANNING PROCESS

A Land Acquisition and Resettlement Framework (LARF) has been prepared. This sets out the commitments of PESR relating to land acquisition and livelihood restoration which will ensure compliance with both applicable Macedonian legislation and the requirements of the EBRD policies defined in Environmental and Social Policy (2008), especially PR5 Land Acquisition, Involuntary Resettlement and Economic Displacement.

The LARF includes a Project description, analysis of expropriation law and policy related to land acquisition, the principles and the course of compensation, an entitlements matrix and information on the consultations process and grievance mechanism. It sets out the impacts of the alignment to land property in the five cadastral municipalities (CM) through which the expressway passes: CM Debriste; CM Drenovo; CM Farish; CM Golem Radobil¹⁴ and CM Raec, all located within the boundaries of the municipality of Kavadarci. More than half of the land required for construction of the route (52.0%) belongs to the state, while 30.9% is owned by private individuals. 2.9% is owned by companies, and the ownership of 14.2 % of the parcels is unknown.

Around 495,000 m² of land will require to be expropriated. 66.5% of the planned route will pass through low-grade/low-productivity agricultural fields. Some fields are planted with vineyards, and some are abandoned vineyards. Part of the road passes through pasture land. Three companies have plots through which the road passes. The percentage of land to be expropriated from each company is 83.2 %, 18.0 % and 4.9% respectively.

All affected assets located along the planned route which are entitled to compensation were inventoried. Based on the analysis of collected secondary data, whether expressed in absolute numbers or percentages, the total number of parcels for land that needs to be acquired for the planned route is 203.

A socio-economic census and additional information on the land use in the area, and the likely land and livelihood impacts is currently being carried out (in May and June 2014). Once the necessary information is available, it is envisaged that a Livelihoods Restoration Framework (LRF) will be developed rather than a Resettlement Action Plan (RAP). The LRF will probably be required in place of a RAP given that no actual resettlement of dwellings is required. The LRF will be based on the framework and commitments set out in the LARF. Meetings with the affected land owners/ tenants for the purpose of clarifying the legal issues related to compensation and other topics about the Project are also planned to be held in May/June 2014.

¹⁴ The CM Golem Radobil belongs to the municipality of Prilep. It lies over 5 km from the route. Around 63,000 m² of land of unknown ownership shall be acquired for the Project.

6 SUMMARY OF BASELINE ENVIRONMENTAL & SOCIAL CONDITIONS

6.1 ENVIRONMENTAL BASELINE

Setting

The proposed road corridor runs in parallel to the River Raec, through the Faris and Drenovo Gorges, which are surrounded on either side by hilly terrains. The topography of the Project area is complex as a result of the presence of different rock types, and the erosion effect of the river. The alignment has a combination of steep and mild slopes, intersected with gullies and watercourses.

A modified Mediterranean climate prevails in the Project area, created by a combination of Mediterranean and Continental influences. The highest temperatures are observed in July and August and the lowest are measured in January. Rainfall in the Project area is relatively low. The prevailing winds are from the north/northwest.

The road alignment crosses the catchment of the River Raec, which is a tributary of the River Crna. In the Project area, the river flows in a north-easterly direction. The expressway largely follows in parallel with the River Raec, crossing above it at several points. The River Raec is 33 km long and drains a relatively large catchment area of 304 km². Its aquatic ecosystem has been altered by anthropogenic influences, mainly from agricultural production. The abundance of aquatic plants which are present in the watercourses during the whole year suggests eutrophication of the waters (high nutrient content leading to unsustainable plant growth, and oxygen depletion). In the summer period pondweed (*Potamogeton fluitans*) prevails, and in the slower river sections duckweed (*Lemna minor*) covers the surface.

Flora and Fauna

Both natural and anthropogenic habitats are present along the route. A classification of habitats was made using the standard EUNIS¹⁵ criteria. The natural habitats in the area include;

Xero-thermophilus forests of pubescent oak and oriental hornbeam which are present as fragmented natural and degraded habitats. Natural habitats are found at three sections (0+000 - 0+500 km, 0+800 - 1+400 km, and 5+000 - 6+000 km), while degraded habitats are identified at (0+000 - 2+200 km, and 3+000 - 8+000 km). The total area of this habitat to be cleared for the Project is around 99,000 m².

Well developed riparian belts with willows and poplars which are found along the Raec River and temporary water courses. They are found at the sections where the route approaches or crosses the Raec River and temporary water courses. More specifically, riparian habitats are present at 0+400 - 1+482 km, 2+184 - 2+776 km, 3+029 - 3+506 km, 4+205 - 4+557 km, 5+129 - 6+057 km, 7+014 - 7+223 km, 7+543 - 7+871 km, 8+132 - 8+499 and at 9+910 km. Bridges are planned at the crossing points between the route and the River Raec, while canals and culverts will be constructed at the intersections of the route with temporary water courses. The total area of this habitat to be cleared is estimated at 49,556m².

Dry grass pseudo-steppes. These habitats are found mostly along the stretch of road to the east and north of the Project. These are of high conservation importance for Europe and are listed in Annex I of the Habitats Directive. Some are present at 9+600 - 9+800 km. Around 7000 m² needs cleared for the Project.

Rocky terrain: Calcareous cliffs and rocks form a special habitat type where vegetation is sparse due to harsh climate and poorly developed soils. In these extreme conditions specialised types of plants (*chasmophyte*) and animals appear. The most important habitat of this type is the Drenovo Gorge itself, which belongs to one of the ten refugium areas in Macedonia. This habitat contains relict fern communities (including *Adiantum capillus-veneris*, *Molinia caerulea*, *Stachys Iva*) and other endemic flora and fauna (including the endemic snail *Carinigera drenovoensis*). This habitat is therefore the most sensitive along the entire route. Rocky terrains are present at 5+300 - 5+600 km, within the Drenovo Gorge Monument of Nature Protected Area. An area of approximately 15,000m² (or 3% of the total area) will be disturbed for the Project.

Anthropogenic habitats including farmlands and crops, orchards, vineyards and rural settlements are also present.

¹⁵

<http://eunis.eea.europa.eu/habitats.jsp>

In the Drenovo Gorge, caves that support specific animal life (e.g. arthropods and bats) can be found. Cave habitats are present on a small area at km 5+500.

The aforementioned habitat types have been mapped, and are shown in the following figures. The Drenovo junction is shown in blue.

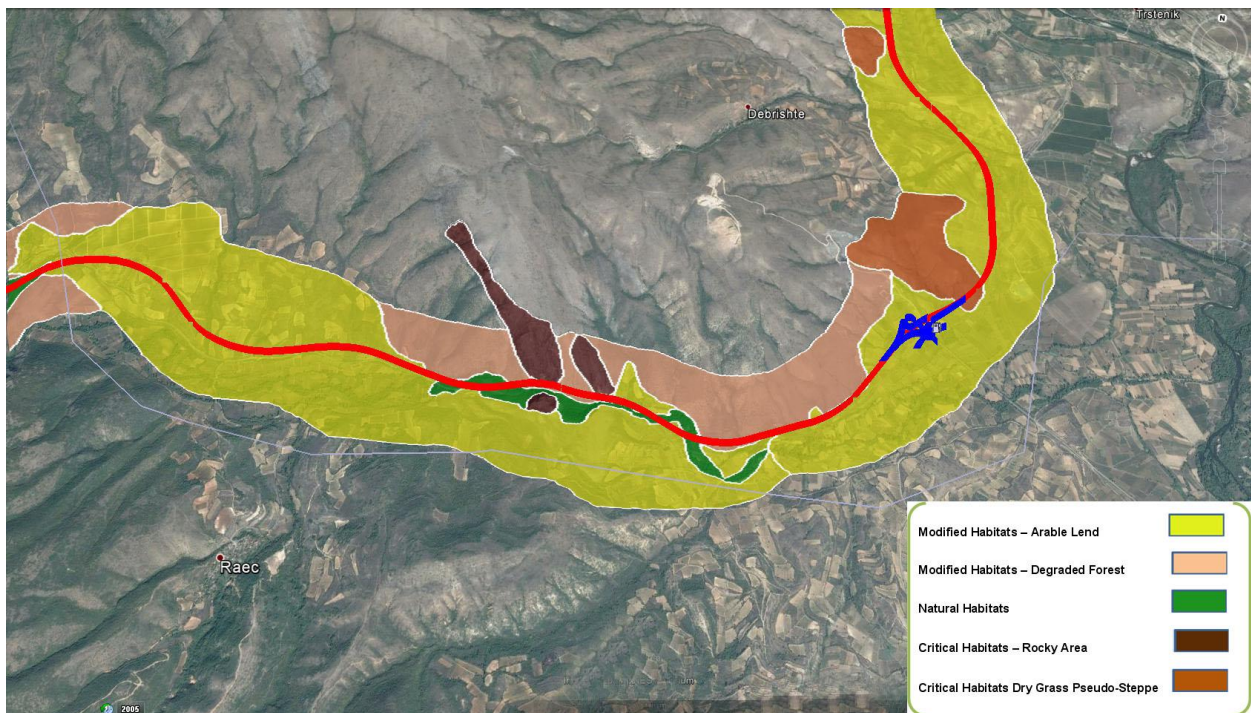


Figure 10 Habitat types along the Route (Eastern Section)

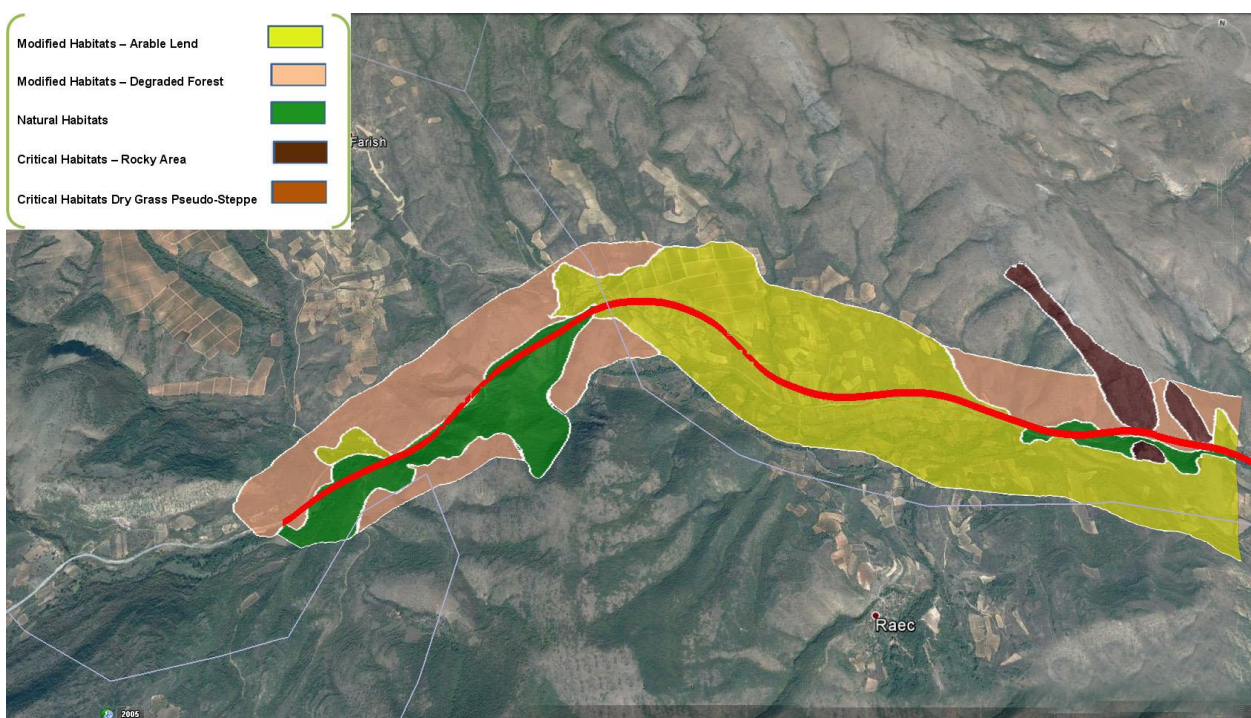


Figure 11 Habitat types along the Route (Western Section)

***Carinigera drenovoensis*.** This endemic snail is also found in the area, although it is thought to be limited to the upper parts of the Drenovo Gorge. See map below for area of suitable habitat.

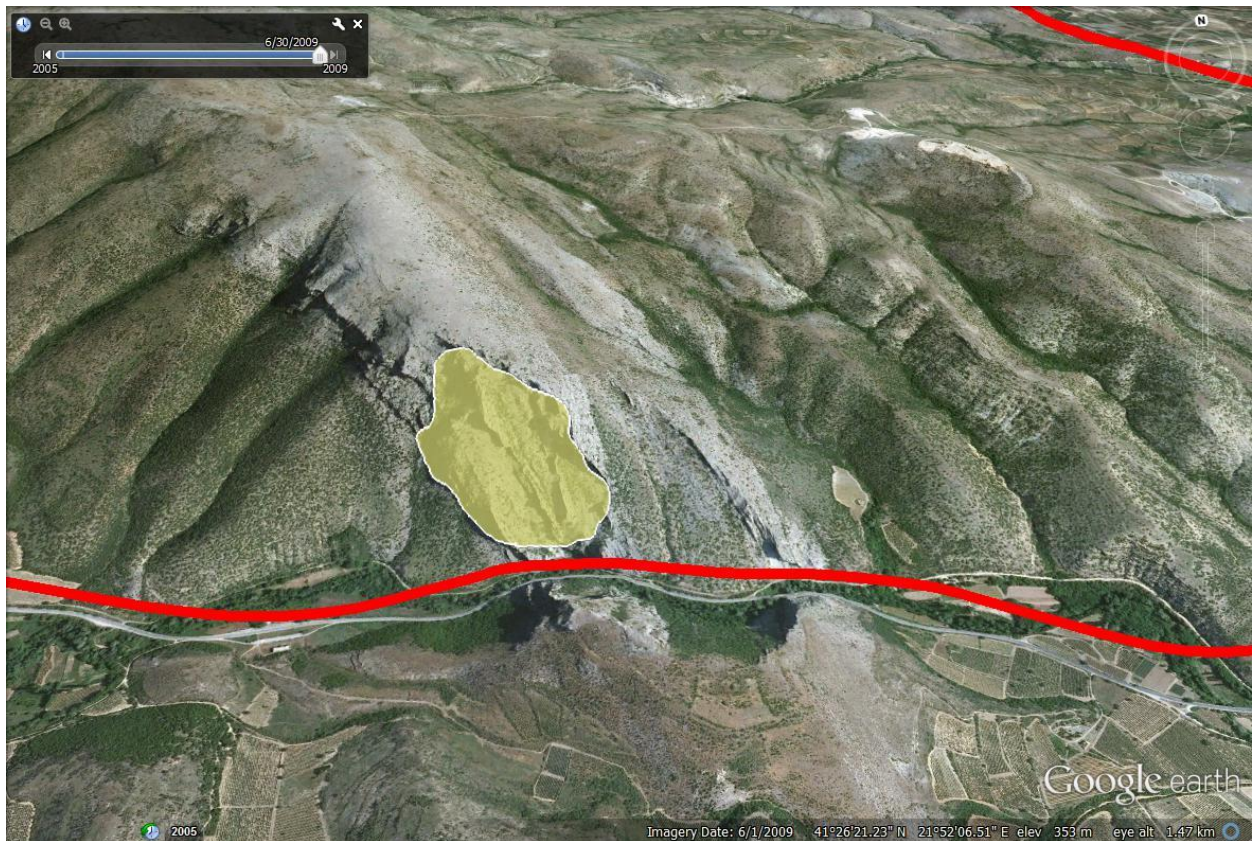


Figure 12 Suitable Habitat of *Carinigera Drenovoensis* (Endemic Snail)

Egyptian Vulture. Two nesting pairs of Egyptian Vultures have also been documented in the upper parts of Drenovo Gorge, although the location of the nests and the proximity to the road scheme are not currently confirmed. Further survey has been commissioned to inform the project preparation. Their likely foraging area is shown on the figure below.

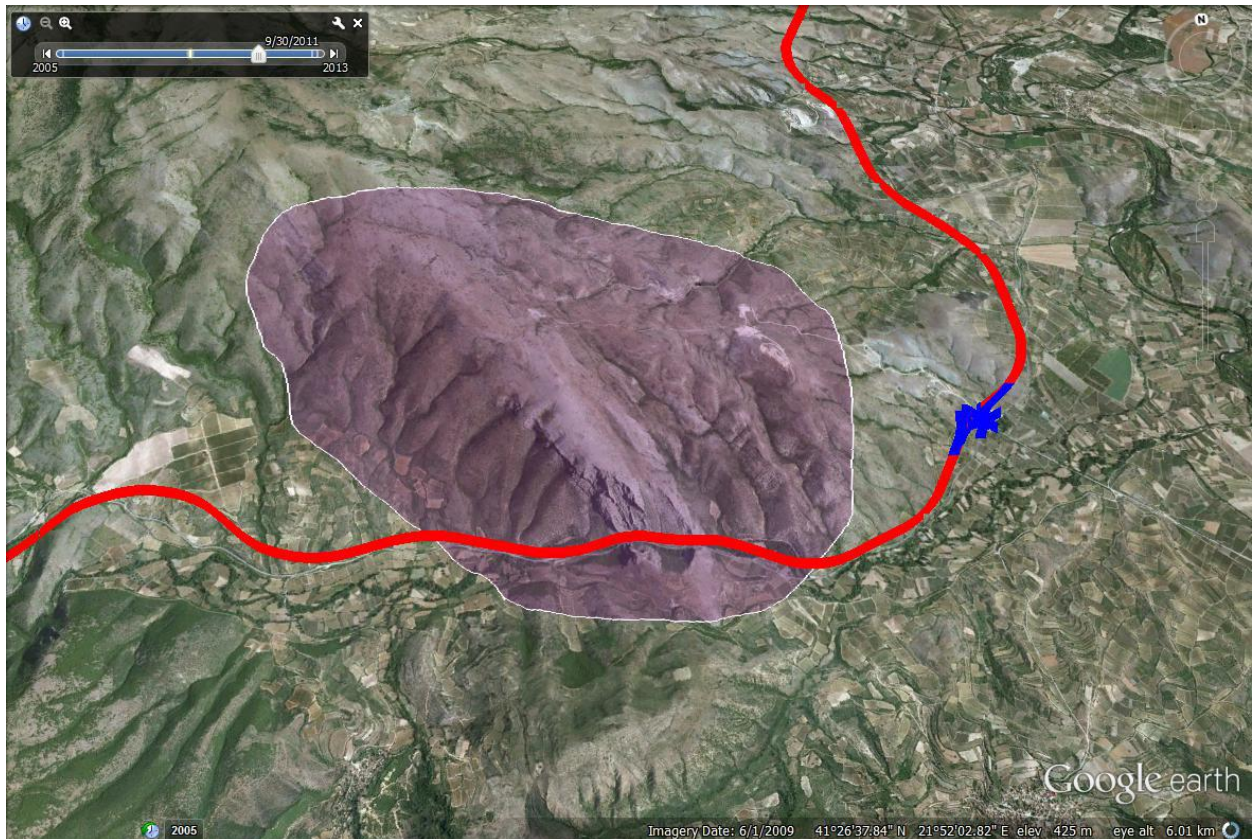


Figure 13 Suitable Foraging Area of Egyptian Vulture

Protected Areas

As noted, the route crosses the Monument of Nature “Drenovo Gorge” and the Emerald Site “Raec. The Monument of Nature “Drenovo Gorge” corresponds with the IUCN III category. It was designated in 2001 due to the presence of the relict community of ferns *Adiantum capillus-veneris*, *Molinia caerulea*, *Stachys Iva* etc, the endemic snail (*Carinigera drenovoensis*), and dragonflies *Ophiogomphus cecilia* and *Caliaeschna microstigma*. Local importance has also been assigned to the present geomorphologic features of the gorge and its cliffs. The emphasis of Category III management is not on protection of the whole ecosystem, but of particular natural features. The location of the “Drenovo Gorge” is shown and the interaction of the road with it, are shown in the following figure.

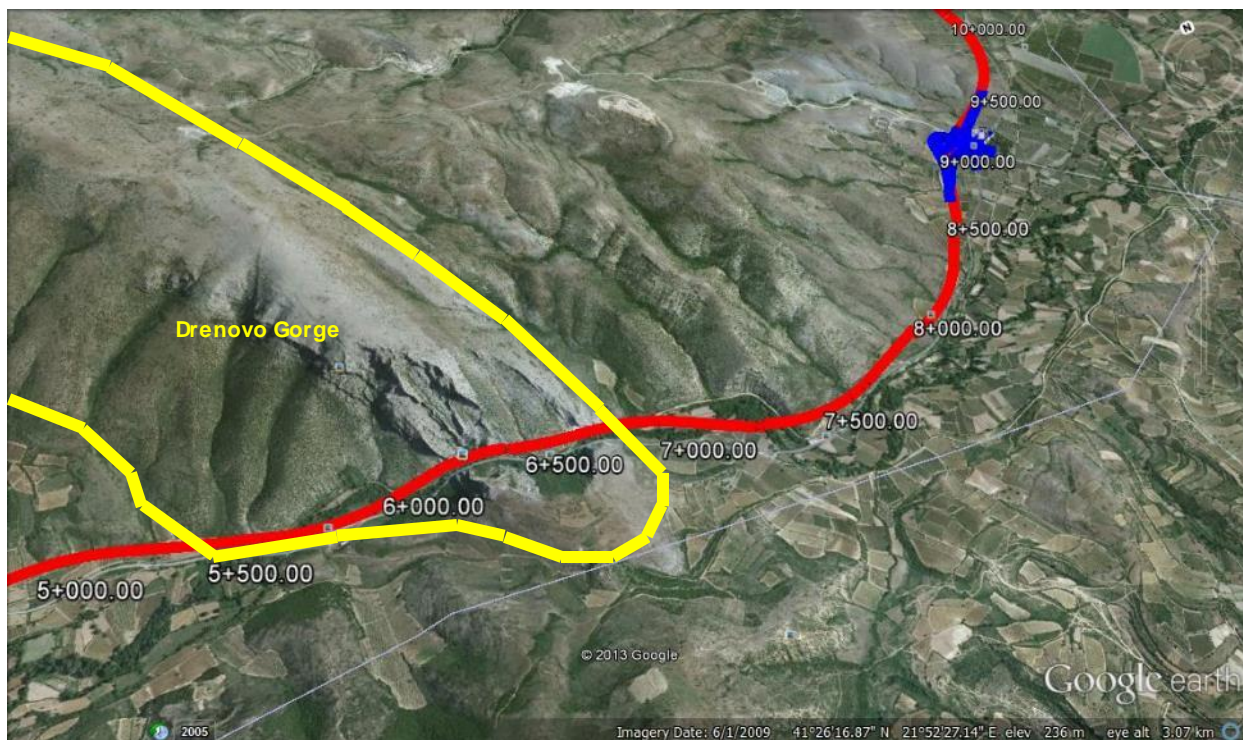


Figure 14 Location of the Monument of Nature "Drenovo Gorge" and the alignment of the Expressway

The road section lies within the Raec Emerald site. This is one of 35 habitats designated as part of the Emerald network in the Republic of Macedonia, as shown on the figure below.

It covers the entire 198 km² catchment of the Raec River. The valley of the Raec River was identified in the period 2007-2011, and it overlaps with an Important Plant Area (IPA) - Raec-Reservoir Tikvesh, and an Important Bird Area (IBA) - Raec River Valley. To date, the MoEPP has not conducted zoning and/or mapping of habitats or species within the Emerald Site. The Monument of Nature "Drenovo Gorge" Protected Area is part of the Emerald Site "Raec".

The area within the boundary of the Emerald Site "Raec" includes inhabited areas, cultivated land and infrastructure corridors. The proposed road follows the corridor of an existing road corridor which follows broadly the Raec River.

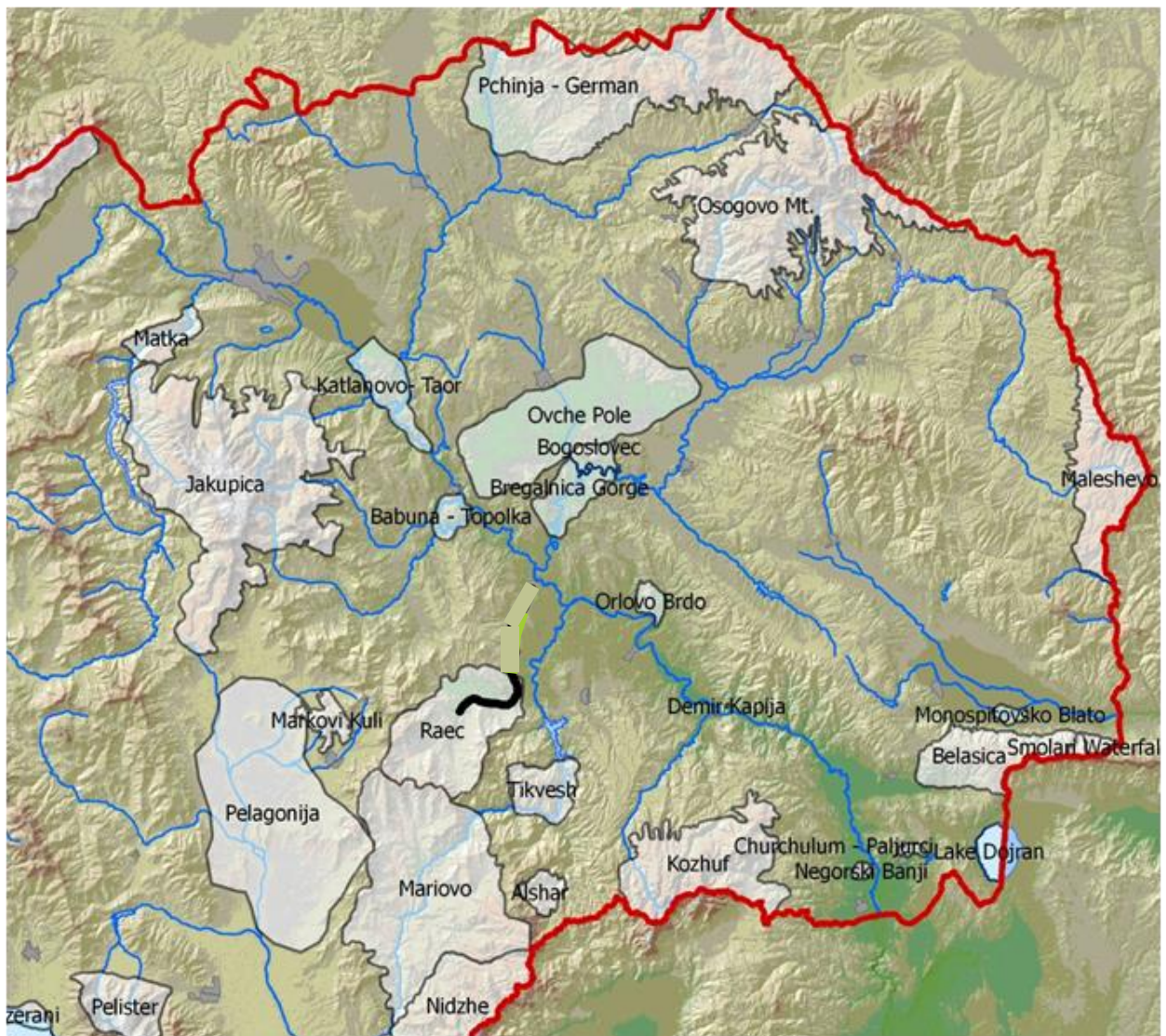


Figure 15 Boundaries of the proposed Emerald Site "Raec" and the alignment of the Expressway

Assessments

In order to fulfil requirements of Article 53(4) of the Law on Nature Protection regarding the Protected Areas, an appropriate assessment style analysis under Article 6 of the Habitats Directive was carried out as part of the EIA studies. This identified that the Project will cause some fragmentation of habitats and will impact negatively on the maintenance of suitable conditions for birds which will require mitigation measures related to the schedule and method of construction.

Because of these sensitivities, and in order to identify focused and comprehensive mitigation and potentially offsetting measures, PESR has identified the need to conduct a **Critical Habitats Assessment (CHA)**, see Section 7.3 for more details.

The assessment will also make recommendations on avoidance, mitigation and offsetting. It will inform a Biodiversity Management Plan (BMP) and, if found to be required in the Critical Habitats Assessment, a Biodiversity Offsetting Management Plan (BMOP). The assessment will be commissioned by PESR and will include recognised experts on the habitats and species present. The CHA will be publicly disclosed when complete.

6.2 SOCIAL CONTEXT

The alignment of the planned expressway lies within the municipality of Kavadarci. The alignment passes close to the villages of Faris (approx. 2.2 km from planned expressway), Raec (approx. 1.5 km from planned expressway), Drenovo (approx. 1.8 km from planned expressway) and Debriste (2.0 km from planned expressway). The village of Golem Radobil lies over 5 km from the route. The area is sparsely

populated, and the population of the villages is small. Key figures¹⁶ and descriptions of socio-economic features of every village are provided below.

Only 7 or 8 households live in Faris village. The population is elderly and there are only two children. Most only have a primary education and very few attended secondary school. The main economic activity is farming (vineyards) and animal husbandry. Only 5% of the farming land around the village is irrigated. The houses are connected to electricity and water supplies, but there is no sewerage network. Public transport is poor and the local road network is very poor. There is an increasing trend of abandoning houses as the young ones migrate to cities due to the low income from agriculture and a lack of public services (education and healthcare).

There are around 50 permanent residents in Raec village, although official statistics report 40 families resident in the village. There is only one child attending elementary school. Most of the people have acquired only primary education and very few attended secondary school. One quarter of the active population works in industry (Tikvesh Winery and Feni factory). The others earn their living from farming (vineyards) and cattle breeding, while 21 persons are pensioners. Public transport is poor and the local road network is very poor. The houses are connected to electricity and water supply. There is no sewerage network.

Drenovo is one of the largest villages within the Kavadarci municipality. According to the official statistics, there are 218 households in Drenovo, of which 30 have a single member. Seven families live on welfare. There are 344 men and 304 women in Drenovo. The main livelihood is agricultural. Approximately 30 families are engaged solely in agriculture, while the income of other families is supplemented from salaries, redundancy compensation, pensions, and social welfare. Drenovo is well connected to the neighboring areas by an asphalt local road that branches off from the Prilep-Gradsko state road (A1). There is an elementary school in the village with roughly 90 pupils, of which 8 are boarders. The village is connected to electric and water supplies, and there is a sewerage system in the village.

The village of Debriste has 18 households permanently living in the village. Most residents make a living from non-agricultural activities, with only 3 households engaged solely in agriculture. Younger members of the population tend to migrate to the neighboring cities or abroad. At present, there are 9 inhabitants at the age of 25 – 40 years, 3 children at school age and 3 children at pre-school age. There is a school in the village for pupils of 1 – 5th grades, although this school has not functioned for the last 7 years, since there were no children of school age. The village can be reached by an asphalt road. The houses are connected to electricity and water supplies and there is no sewerage network.

Cultural Heritage

An opinion on the Project and its possible impacts on cultural heritage was received from the Ministry of Culture in July 2012. This noted 3 archaeological sites which lie on the road stretch beyond the Project limit, in the section between Drenovo and Gradsko (junction with highway A1), but nothing in the Project area. The proposed road route was deemed acceptable by the Ministry, provided that specific steps were taken regarding pre-construction investigations of the sites, supervision during excavation works, inspections by the competent authority, and special protection measures implemented if necessary. These measures applied to access roads, parking areas, borrow pits, and will be implemented in Chance Finds Procedure to be developed for the Project.

In addition, the road passes close to a cultural-historic monument “Bulgarian Monument from World War I” erected in honour of an incident when 19 soldiers died. The location of the monument is shown on the figure below, outside of the fence line for the road project, and is not likely to be directly threatened by excavations. However, it may be prone to impacts from dust, vibration and accidental damage. The PESR has informed the Ministry of Culture and is discussing methods to prevent damage to the Monument during construction. These will be included in a Cultural Heritage Management Plan which will be incorporated into the Contractor’s contractual requirements.

Local importance has also been assigned to the geomorphologic features of the Drenovo Gorge and its cliffs. These cliffs will be visible from the road, and will form a dramatic backdrop to the stretch passing through the Gorge. The contractor will be prohibited from making any excavations or disposing of spoil in the Drenovo Gorge Protected Area.

¹⁶ The figures of population are quoted from the Census implemented in 2002. Other information is obtained from the municipalities and interviews.

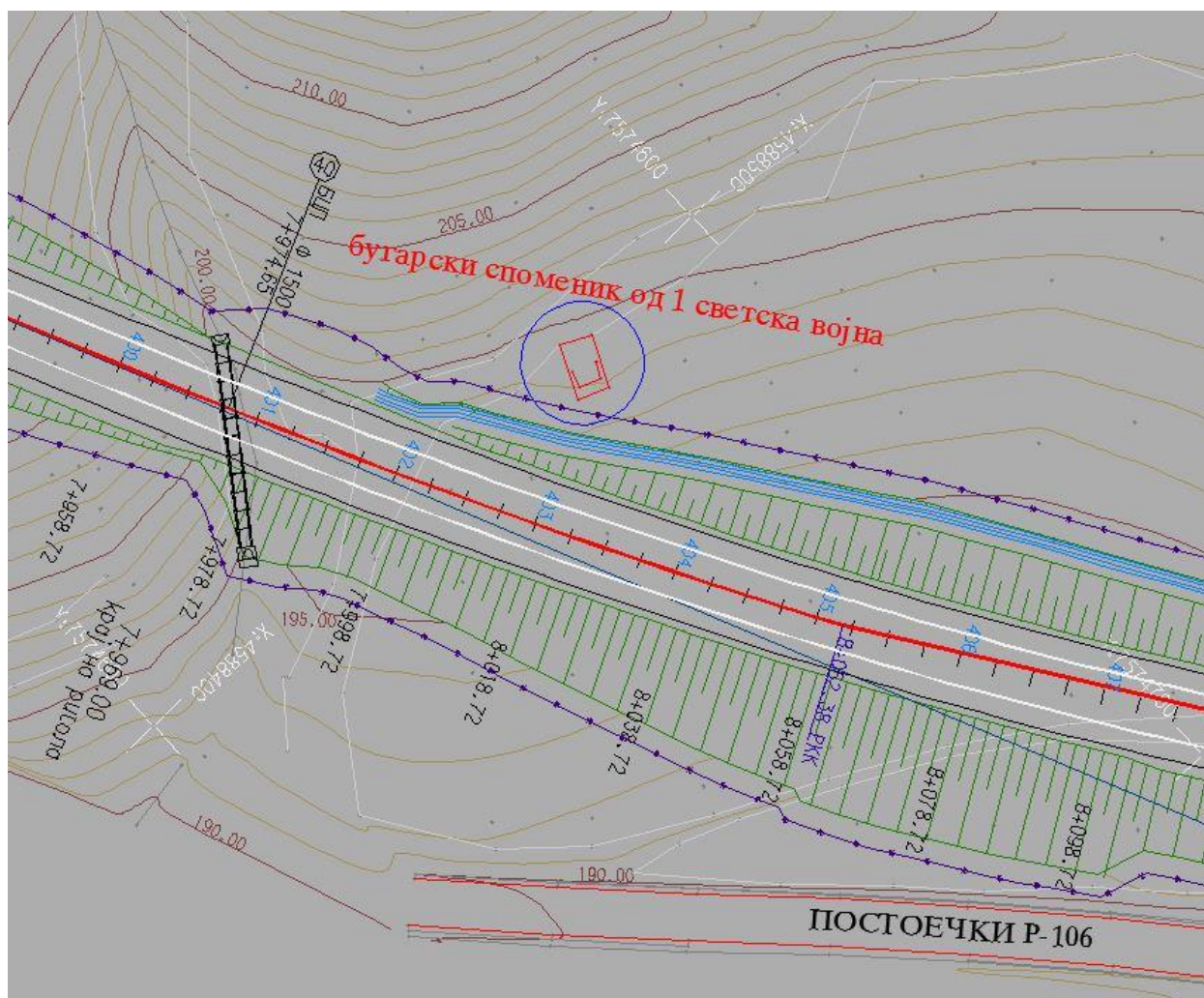


Figure 16 Location of the Monument of the Bulgarian Soldiers

6.3 BASELINE AIR QUALITY AND NOISE

Baseline air quality and noise measurements along the proposed road section have been taken at the following three locations:

- T1 - Y = 7570005.7327; X = 4589062.4029; km 3+100, (the land use is predominantly vineyards).
- T2 - Y = 7571873.0695; X = 4588581.6509; km 5+130; (close to agricultural buildings, and close to Drenovo Gorge Protected Area).
- T3 - Y = 7575320.0609; X = 4589302.5495, km 9+120: (the land use is degraded land with some existing buildings, close to the site of the proposed Drenovo Interchange).

These measuring points are highlighted in the following figure.



Figure 17 Measurement Points for Baseline Air Quality and Noise

Source; Report on Measurements of Noise and Ambient Air Quality, GEING, 2014.

Noise levels were measured using a CR:171B, Class I instrument, calibrated with a CR:515 Class I calibrator and checked again after measuring. Measurements were conducted in accordance with the standardised method MKC ISO 1996-2:2010 *Acoustics – Description, Measurement and Appraisal of Environmental Noise Levels – Section 2: Determining Levels of Environmental Noise* (which is identical to ISO 1996-2:2007), as well as the applicable national laws of the Republic of Macedonia, namely the Law on Noise Protection (No. 107/2008).

Particulate levels (PM₁₀) were measured using a Cassella measuring device, built according to standard MKS ISO 12341:2007. NO_x, SO₂ and CO levels were determined using a Gray Wolf instrument built according to the MKS ISO 12039-2001, ISO 10849:1996, ISO 7935:1992 Standards.

The results are summarised below, together with the applicable legal limit for the airshed in the area.

| | Noise (dB) | PM ₁₀ (µm/m ³) | NO _x (mg/m ³) | SO ₂ (mg/m ³) | CO (mg/m ³) |
|-------------------------------|------------|---------------------------------------|--------------------------------------|--------------------------------------|-------------------------|
| Applicable Legal Limit | 70 | 50 | 0.2 | 0.35 | 10 |
| T1 | 40 | <1 | 0.09 | <0.001 | 0.8 |
| T2 | 59 | 2.5 | 0.01 | <0.001 | 0.9 |
| T3 | 55 | 4.6 | 0.12 | <0.001 | 1.5 |

These measurements indicate that the airshed in the road corridor is relatively unpolluted. The area is quiet and not densely populated, and there is no industrial activity in the area. The main sources of noise and emissions are the road traffic, with the combustion of firewood for domestic heating likely to contribute emissions during winter.

7 ENVIRONMENTAL & SOCIAL BENEFITS, IMPACTS AND MITIGATION MEASURES

7.1 ASSESSMENT OF IMPACTS

During the EIA process, the environmental and social impacts were assessed. Assessment topics included: ambient air, water, noise and vibration, biodiversity & habitats and landscape; local communities, employment and livelihoods, access and severance, cultural heritage, community, health, safety and security (including road safety and emergency response) and labour and workforce issues. For each impact, a significance level was determined, according to the following criteria:

| Description | Significance |
|--|--------------|
| Short term and minimal impact causing minimal damage to a small localised area and/or no direct impact on human health | Low |
| Short to medium term impact with moderate environmental damage to defined localised or a wider area and/or possible harm to human health | Moderate |
| Medium to long term impact with major environmental damage over a wide area and/or causing serious injury to human health | High |

In the following text a summary of environmental and social benefits as well as adverse impacts and mitigation measures is made.

7.2 SUMMARY OF ENVIRONMENTAL AND SOCIAL IMPACTS, BENEFITS AND MITIGATION

| Topic | Summary of Impacts/Benefits | Summary of Key Mitigation/Management Measures | Residual Impact Significance |
|-------------------------------------|---|---|------------------------------|
| Environment | | | |
| Air Quality | <p><i>During Construction</i></p> <ul style="list-style-type: none"> Emissions of dust from construction areas, access roads, stockpiles and during loading/unloading activities; emissions from batching plants; emissions from combustion from construction machinery; emissions due to peaks in traffic movements. <p><i>During Operation</i></p> <ul style="list-style-type: none"> Emissions of particulates, NOx, volatile organic compounds, carbon monoxide and other hazardous air pollutants including benzene, from road traffic | <ul style="list-style-type: none"> Dust Management Plan: wetting down/spraying of construction areas, accesses, materials stockpiles and during loading / unloading activities; covering of vehicles carrying dusty materials; wheel washing/spraying of vehicles; management of spoil, etc. Use of emissions-compliant vehicles/machinery; maintaining vehicles/machinery. Prepare a Construction Traffic Management Plan to avoid peak times and heavily trafficked routes. Use of appropriate blasting techniques to minimize dust Planting shrubby and tree species, to absorb polluting matter along the route | Low |
| Noise & Vibration | <p><i>During Construction</i></p> <ul style="list-style-type: none"> Increased noise levels from construction plant and activities; <p><i>During Operation</i></p> <ul style="list-style-type: none"> Noise from increased traffic during operation | <ul style="list-style-type: none"> Noise Control Plan; inform the local population to the extent possible on the construction schedule; Noise exposure periods of workers shall not exceed the legal limits as outlined in ESAP; Operators of noisy machines or worker near them shall be supplied with earmuffs and should be trained how and when to use them. The contractor shall perform blasting operations in daylight hours using best practices and the program will be announced to the nearby settlements in advance as appropriate | Low |
| Biodiversity/Flora & Fauna/Habitats | <p><i>During Construction</i></p> <ul style="list-style-type: none"> Destruction of populations of vegetation species including relict fern communities; Destruction and fragmentation of natural habitats including: Annex I habitats dry-grass pseudo-steppe and rocky terrain; Barrier effects with restrictions to animal movement, habitat fragmentation and reduced populations of wildlife; Increased poaching of wildlife for personal consumption or sale; | <ul style="list-style-type: none"> Conduct Critical Habitats Assessment (CHA) to map and describe natural and critical habitats in more detail; As part of CHA, make recommendations to avoid, mitigate and offset construction and operation impacts; Develop Biodiversity Management Plan (BMP) based on results of EIA and Critical Habitats Assessment, to include measures to | Moderate |

| Topic | Summary of Impacts/Benefits | Summary of Key Mitigation/Management Measures | Residual Impact Significance |
|--------------------------------|---|--|-------------------------------------|
| | <ul style="list-style-type: none"> Colonisation of invasive species | <p>protect specific vulnerable or sensitive habitats and species, and maintain ecosystem services (where relevant). Where appropriate, measures should include avoidance (no-go areas to the contractor), seasonal working (e.g. to avoid nesting of vulnerable birds species), pre-construction relocation of vegetation or fauna, rehabilitation of damaged habitats, and offsetting. Plan to include supervision and monitoring by appropriate and recognised ecological experts.</p> <ul style="list-style-type: none"> If identified as a requirement in the CHA, a Biodiversity Offsetting Management Plan (BOMP) is to be developed, with details on how areas of natural and critical habitat will be offset. Plan to detail offset locations and other management, protection or awareness measures. Plan to include an implementation schedule and costs, as well as an allocation of responsibilities. BOMP to be developed in conjunction with appropriate stakeholders, including expert ecologists, competent authority, local communities, etc. Plan to include monitoring and reporting. | |
| Protected and Designated Areas | <p><i>During Construction and Operation</i></p> <ul style="list-style-type: none"> Some fragmentation of habitats and destruction of flora and fauna species within Drenovo Gorge Protected Area; Some disturbance to the integrity and connectivity of proposed Raec Emerald Area; | <ul style="list-style-type: none"> CHA to include a further documentation of the analysis of alternatives from a biodiversity perspective; Constant supervision of the construction works by a biologist within the protected areas; Provision of underpasses/areas for animals to cross under the expressway. | Low |
| Water Resources | <p><i>During Construction</i></p> <ul style="list-style-type: none"> Increased turbidity of water courses due to construction activities; Concentration of nickel, copper, zinc, cadmium, lead and polycyclic aromatic hydrocarbons (PAHs) in the runoff from the road surface, created as combustion byproducts of gasoline and other fossil fuels Pollution of surface and groundwater due to wastewater discharge from construction camp Pollution of surface and groundwater due to vehicle repairs and | <ul style="list-style-type: none"> Erosion Control Plan; Implement and maintain regularly oil interceptors along the route; Contractor shall prepare for approval, detailed site environmental plans for the base camps and other work sites, which make adequate provision for safe disposal of all wastes, and prevention of spillages, leakage of polluting | Low |

| Topic | Summary of Impacts/Benefits | Summary of Key Mitigation/Management Measures | Residual Impact Significance |
|--------------------------|--|---|-------------------------------------|
| | fuelling. <ul style="list-style-type: none"> Contamination of groundwater and pollution of surface waters during operation by dissolved de-icing chemicals (primarily chlorides of sodium, calcium or magnesium) and sand (altering stream bed environments, causing stress for the plants and animals), discharged into roadsides. | materials etc.; <ul style="list-style-type: none"> The Contractor shall prepare a Spill Response Plan, take appropriate measures to prevent spill and provide spill response equipment; Vehicle will be repaired and fuelled off site, on appropriate surfaces; Calculation of appropriate amounts of salt for protection against frost (i.e. avoidance of overuse), and application of alternative means of defrosting. | |
| Landscape & Visual | <i>During Construction & Operation</i> <ul style="list-style-type: none"> Impairment of visual aesthetics, change of the geo-morphological features by the expressway and spoil piles | <ul style="list-style-type: none"> Screening of construction sites, camps and areas; Designation, use of appropriate stockpiling locations on site and remediation of spoil areas; Re-vegetation of the cuts / fills. | Low |
| Soils and Geology | <i>During Construction & Operation</i> <ul style="list-style-type: none"> Erosion and landslide; Spills from hazardous solid wastes and liquids | <ul style="list-style-type: none"> Erosion Control Plan; Proper handling of hazardous solid wastes and liquids to avoid spilling or leaks to reduce the chances of soil contamination. | Low |
| Social | | | |
| Local Communities | <i>During Construction</i> <ul style="list-style-type: none"> Nuisance (noise, dust, etc) to local population due to construction activities; Impact on agricultural livelihood (see below) Severance effects (see below). <i>During Operation</i> <ul style="list-style-type: none"> Stimulation of economic growth at local level. | <ul style="list-style-type: none"> Traffic Management Plan; Design of workers camps to include fencing and screening of camp from view; Implementation of Workers Code of Conduct based at minimising nuisance to local communities; Grievance mechanism and stakeholder engagement during construction; Crossings to limit severance effects. | Low |
| Employment & Livelihoods | <i>During Construction</i> <ul style="list-style-type: none"> Creation of temporary employments during construction; <i>During Operation</i> <ul style="list-style-type: none"> Access to employment markets outside local area. | <ul style="list-style-type: none"> Contractor to be encouraged to recruit for construction from local communities, by implementation of Local Workforce Recruitment Plan; | Low |
| Land & Property | <i>During Construction</i> | <ul style="list-style-type: none"> A Livelihoods Restoration Framework (LRF) will be prepared. A Land Acquisition and | Low |

| Topic | Summary of Impacts/Benefits | Summary of Key Mitigation/Management Measures | Residual Impact Significance |
|---|--|---|-------------------------------------|
| | <ul style="list-style-type: none"> Permanent land loss Impact on agricultural livelihoods | <p>Resettlement Framework (LARF) has already been prepared, outlining the commitments and entitlements. Affected people will be duly compensated in accordance with the compensation framework outlined in the LARF.</p> <ul style="list-style-type: none"> Where available and preferred by owners, other land (state owned) will be utilised for continuation of agricultural production. | |
| Access & Severance | <p><i>During Construction</i></p> <ul style="list-style-type: none"> Impacts on access and severance effects. | <ul style="list-style-type: none"> Traffic Management Plan to include: Identification of all public roads and paths that will be affected and proposal for the travel routes during the construction period; Minimization of the traffic disturbance; Signing of the construction areas/diversions etc; and Public notification of any traffic-related issues (e.g. road closures); Crossings where necessary, to limit severance effects. | Low |
| Cultural Heritage | <p><i>During Construction</i></p> <ul style="list-style-type: none"> Potential damage to and to the setting of the historic monument dedicated to Bulgarian soldiers from WWI Potential discovery of cultural heritage during construction | <ul style="list-style-type: none"> Cultural Monument Protection Plan agreed between the PESR, Ministry of Culture and the Contractor. Chance Finds Procedures - upon identification of suspected remains, immediately cease operations around the site and wait for an expert from the Ministry of Culture to supervise the activities | Low |
| Community Health, Safety and Security (inc. Road Safety & Emergency Response) | <p><i>During Construction</i></p> <ul style="list-style-type: none"> Impacts from influx of temporary workers; Impacts from increased traffic and heavy vehicles on local roads during construction; Safety issues associated to the entrance of non-authorised people. <p><i>During Operation</i></p> <ul style="list-style-type: none"> Risk of accidents on new road. | <ul style="list-style-type: none"> Health & Safety Plan and an Emergency Preparedness and Response Plan will be developed prior to construction works starting; Traffic Management Plan for safe access to construction sites and to minimise impacts on the existing roads; Information about the project activities will be announced through the media; Community health and safety educational programme will be developed; Workers will receive training and guidance in how to avoid conflicts with the local community members and sign a labour code of conduct. Any material damage made by workers will be | Low |

| Topic | Summary of Impacts/Benefits | Summary of Key Mitigation/Management Measures | Residual Impact Significance |
|---------------------------|---|--|-------------------------------------|
| | | <p>subject to fair compensation. Security arrangements for contractor facilities will be carefully designed and managed;</p> <ul style="list-style-type: none"> ▪ Worker camps will be located outside the communities; ▪ Road Safety Risk Assessment to be completed and recommended safety measures implemented. | |
| Labour & Workforce Issues | <p><i>During Construction</i></p> <ul style="list-style-type: none"> • Infringement of workers/labour rights/best practice during construction; • Impacts from in migration of workers from outside the area. | <ul style="list-style-type: none"> • HR Policy, including Local Workforce Recruitment & Management Plan to assure local employment of as much as possible, and to define worker labour rights. | Low |

7.3 CRITICAL HABITATS ASSESSMENT (CHA)

Critical Habitats Assessment

As noted earlier, PESR will conduct a Critical Habitats Assessment of the areas in the Drenovo Gorge which are affected by the Project, focusing on:

- Annex I Priority Habitat: dry grass pseudo steppes and rocky terrain;
- Likely habitats of endemic snail (*Carinigera drenovoensis*);
- Chasmophyte vegetation focusing on the relict fern communities (*Adiantum capillus-veneris*, *Molinia caerulea*, *Stachys Iva*, etc.
- Nesting and foraging areas for Egyptian Vulture;
- Annex I Priority Habitats to the north of Drenovo Interchange, which will be affected by the alignment adjoining the section under consideration by EBRD;

The assessment will include;

- Location mapping of habitats and species distribution;
- Information on endemism and wider distribution in Macedonia;
- Assessment of Project impacts relating to construction and operation;
- Consideration of ecosystem services and traditional management of habitats;
- Recommendations on avoidance, mitigation and offsetting;
- Further documentation of the alternatives assessment from a biodiversity perspective (as indicated in section 2.3 above).

Biodiversity Management Plan (BMP)

Based on the results of the EIA, CHA, and other information and advice from experts, PESR will develop a Biodiversity Management Plan (BMP). This Plan will include measures to protect specific vulnerable or sensitive habitats and species, and maintain ecosystem services (where relevant). Where appropriate, measures will include avoidance (no-go areas to the contractor), seasonal working (e.g. to avoid nesting of vulnerable birds species), pre-construction relocation of vegetation or fauna, rehabilitation of damaged habitats, and offsetting. The Plan will include supervision and monitoring by appropriate and recognised ecological experts.

The BMP will be developed with significant expert technical input from ecologists familiar with the habitats and species at risk, and where appropriate, with assistance from local communities in relation to traditional management of habitats.

Biodiversity Offsetting Management Plan (BOMP)

Based on the recommendations made in the CHA, if appropriate, a Biodiversity Offsetting Management Plan (BOMP) will be developed to detail how areas of natural and critical habitat will be offset. This Plan will detail offset locations and other management, protection or awareness measures, and will include an implementation schedule and costs, as well as an allocation of responsibilities. The BOMP will be developed in conjunction with appropriate stakeholders, including expert ecologists, competent authority, local communities, etc. and will include monitoring and reporting.

7.4 CUMULATIVE EFFECTS

Cumulative effects could potentially result from the induced changes to land use over the longer term, arising from the economic development induced by the new road scheme. These effects could include the development of industrial zones and the abandoning of agricultural land as people move to higher waged jobs. As travel time reduces, the surrounding land may become more attractive for the development of new structures adjacent to the expressway (e.g. motels, petrol stations equipped with accommodation capacity, restaurants, etc.). Improved accessibility may trigger wider changes in the region. Such economic benefits are likely to have a positive effect on the local economy and on local livelihoods. However, such major land use changes could also result in reduction of environmental

resources and biodiversity in particular. Any future regional development plans therefore need to be integrated into land use plans which take into account the biodiversity and ecological value of the lands.

The effects on water quality of contaminated storm water run off from the road may cause downstream effects such as contaminated surface and groundwater and health risks for humans and animals as well as reduced availability of quality water for irrigation. These effects are mitigated by storm water controls including the use of oil interceptors.

One possible cumulative effect of the road corridor is habitat fragmentation and its effect on species viability. This may in turn create changes in the food chain and the distribution of plant communities. These effects are mitigated by the development and implementation of a strong Biodiversity Management Plan, which includes ongoing monitoring of biodiversity, with specialist ecological input.

As noted, the aforementioned cumulative effects will be managed through the implementation of the mitigation and monitoring measures outlined. It is deemed that if all recommended measures are implemented, the risk of significant adverse cumulative effects is minimal.

8 ENVIRONMENTAL & SOCIAL MANAGEMENT & MONITORING

8.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT

The EIA contains an outline plan for managing the environmental impacts. The key elements have been summed up in the table above. More specific detail on several aspects of these management plans will be developed in the next stage of project development.

An **Environmental and Social Management System (ESMS)** will be developed for the construction and operation of the road. This will include a **Construction Environmental and Social Management and Monitoring Plan (CESMMP)** which will draw together all the management requirements to minimise disturbance to environmental and social receptors during construction (including protected areas, flora and fauna, groundwater and surface water, community relations, etc).

The goal of these plans is to ensure that all necessary mitigation measures are carried out to counter the adverse environmental impacts, and that enhancement measures are used where feasible and practical.

Several specific plans as mentioned in the EIA and impacts/mitigation table above. These will be developed and incorporated into the CESMMP as required. They include:

- Dust Management Plan;
- Construction Traffic Management Plan;
- Noise Control Plan;
- Biodiversity Management Plan;
- Biodiversity Offsetting Management Plan (BOMP) (if necessary);
- Erosion Control Plan;
- Spill Response Plan;
- River Crossings Plan;
- Waste Management Plan;
- Traffic Management Plan;
- Cultural Monument Protection Plan;
- Chance Finds Procedure;
- Health & Safety Plan;
- Emergency Preparedness and Response Plan;
- Road Safety Audit;
- Workforce Management Plan.

8.2 ENVIRONMENTAL AND SOCIAL MONITORING

Monitoring will form an important part of the ESMS. During both construction and operation, certain activities, indicators and environmental and social resources will be monitored. Monitoring may include observation and recording, or may include data gathering and sampling. Monitoring requirements will be built into the above Management Plans where appropriate. Key parameters to be monitored during construction include;

- Air quality;
- Noise levels;
- Water quality;
- Land take by the contractor, especially related to the Drenovo Gorge; and
- Effects on biodiversity.

During operation of the road, periodic monitoring of air quality and noise will be conducted on an ongoing basis.

In addition, PESR will monitor:

- The implementation of the Stakeholder Engagement Plan,
- The implementation of the Livelihoods Restoration Framework; and
- The implementation of the Grievance Mechanism.

Monitoring reports will be required from the Contractor and Operator during the construction and operational phases. These will be submitted to the relevant inspection authority.

The monitoring results will be useful for assessing the long term cumulative effects, if any, especially in relation to biodiversity impacts. If ongoing problems occur, adaptive mitigation measures can be developed and implemented.

9 FURTHER INFORMATION & CONTACT DETAILS

Full project preparation documents, including the EIA, its respective annexes, including the assessment of the Emerald Site are available on the PESR website (<http://www.roads.org.mk/en/index.php>).

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