

---

# MORAVA CORRIDOR MOTORWAY PROJECT

Republic of Serbia Ministry of Construction,  
Transport and Infrastructure

## ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

---

NOVEMBER 2020



## MORAVA CORRIDOR MOTORWAY PROJECT

### ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

Version	Revision	Date	Prepared by						Checked by	Approved by	
Draft	A.0	February 2020	T. Eser Env. Eng.	E. Kaya Sociologist	Y. Çelikel Social Expert	T. Nazlı Env. Eng.	C. Denizli Biologist	E. Okumuşoğlu Geo. Eng.	K. Ağrıman Env. Eng.	D. E. Kaya Env. Eng.	G. Ozenirler Env. Eng, M.S.
Final Draft	B.0	May 2020	T. Eser Env. Eng.	A. Duman Sociologist	Y. Çelikel Social Expert	T. Nazlı Env. Eng.	C. Denizli Biologist	E. Okumuşoğlu Geo. Eng.	K. Ağrıman Env. Eng.	D. E. Kaya Env. Eng.	G. Ozenirler Env. Eng, M.S.
Final	C.0	November 2020	T. Eser Env. Eng.	A. Duman Sociologist	Y. Çelikel Social Expert	T. Nazlı Env. Eng.	C. Denizli Biologist	E. Okumuşoğlu Geo. Eng.	K. Ağrıman Env. Eng.	D. E. Kaya Env. Eng.	G. Ozenirler Env. Eng, M.S.

Revision Codes: A: Draft, B: Final Draft, C: Final

## SE102-000-ES-REP-00002

November 2020

Client:

# ENKA

Balmumcu Mah.,  
Zincirlikuyu Yolu No: 10,  
34349,  
Beşiktaş Istanbul, Turkey

Client:



11 Pilgrim Street  
London  
England  
EC4V 6RN  
United Kingdom

Client:



KORIDORI SRBIJE LTD.  
Kralja Petra 21, Belgrade  
Serbia  
☎: +381 (011) 3344148

Consultant:



2U1K INTERNATIONAL LTD.  
PS 6 - 3rd Floor, The Meydan  
Office Tower  
Meydan Road, P.O. Box 450676  
Dubai – UAE  
☎: +90 (533) 283-6569

## TABLE OF CONTENTS

	<u>Page</u>
<b>1 EXECUTIVE SUMMARY.....</b>	<b>1</b>
1.1 Introduction .....	1
1.2 ESIA Objectives .....	2
1.3 Project Description .....	3
1.3.1 Project Background.....	3
1.3.2 Project Overview .....	5
1.3.3 Project Development and Project Alternatives.....	7
1.3.3.1 Technological Alternatives .....	10
1.3.3.2 Zero Alternatives .....	10
1.4 Legal Framework .....	10
1.5 Baseline Conditions.....	14
1.5.1 Area of Influence .....	14
1.5.1.1 Environmental Area of Influence .....	14
1.5.1.2 Social Area of Influence .....	15
1.5.2 Environmental Baseline Conditions .....	15
1.5.3 Social Baseline Conditions .....	18
1.6 Impact Assessment.....	19
1.6.1 Environmental Impact Assessment and Mitigation Measures .....	19
1.6.2 Social Impact Assessment and Mitigation Measures .....	21
1.7 Stakeholder Engagement.....	23
1.8 Conclusions.....	23
<b>2 INTRODUCTION.....</b>	<b>1</b>
2.1 Background to the Proposed Morava Corridor Motorway Project.....	1
2.1.1. Proposed Morava Corridor Motorway Project .....	2
2.1.2. Project Justification.....	3
2.1.3. Project Overview .....	4
2.2 National EIA Process .....	8
2.3 ESIA Process .....	14
2.3.1 International ESIA Consultants.....	15
2.3.2 Structure of ESIA Report .....	17
<b>3 PROJECT DESCRIPTION .....</b>	<b>1</b>
3.1 Project Development and Project Alternatives.....	1
3.1.1 Zero Alternative.....	11
3.1.2 Technological Alternatives .....	11
3.2 Project Elements and Alignment.....	11
3.3 Design Criteria .....	17
3.4 River Regulation and Drainage Control .....	17
3.5 River Regulation Design.....	19
3.6 Above Ground Structures and Key Infrastructure .....	29

3.7	Project Facilities .....	33
3.7.1	Camp Sites, Storage Sites .....	33
3.7.2	Quarries and Borrow Pits .....	38
3.7.3	Concrete Batching, Beam, Subbase, Asphalt and Screen – Wash Plants .....	41
3.7.4	Temporary Access Roads .....	45
3.8	Third Party Utilities .....	46
3.9	Project Construction Activities .....	51
3.9.1	Description of Methods of Earthworks .....	52
3.9.2	Excavation of Topsoil .....	54
3.9.3	Excavation of Any Material Except Topsoil.....	57
3.9.3.1	Common Excavation .....	57
3.9.3.2	Replacement of Unstable Soils at Formation.....	57
3.9.3.3	Rock Excavation .....	59
3.9.4	Mixed Material to Waste or Fill .....	60
3.9.5	Spreading and Compacting of Fill.....	61
3.9.6	Reinforced Concrete Piles.....	62
3.9.7	Lean Concrete.....	62
3.9.8	Foundation Concrete.....	63
3.9.9	Wall Concrete .....	64
3.9.10	Pier Concrete .....	65
3.9.10.1	Piers for Viaducts .....	65
3.9.10.2	Piers for Overpasses.....	65
3.9.10.3	Pier Heads for Overpasses .....	65
3.9.11	Pier Heads for Viaducts.....	65
3.9.12	Beam Transportation.....	66
3.9.13	Beam Installation.....	66
3.9.14	Deck Slab Concrete .....	67
3.9.15	Description of Drainage Work Methods .....	67
3.9.15.1	Internal Drainage.....	68
3.9.15.1.1	Collector Pipes.....	68
3.9.15.1.2	Cross Pipes .....	68
3.9.15.1.3	Slotted Pipes.....	68
3.9.15.1.4	Channel and Gutters .....	69
3.9.15.2	External Drainage .....	70
3.9.15.2.1	Culverts.....	70
3.9.15.2.2	Box Culverts .....	70
3.9.15.2.3	Pipe Culverts.....	70
3.9.15.2.4	Drainage Ditches .....	70
3.9.16	Description of Paving Work Methods.....	70
3.9.16.1	Preparation of Sub-Grading – Capping Layer.....	70
3.9.16.2	Mechanical Sub-Base .....	72
3.9.16.3	Asphalt Concrete Binder Course .....	72

3.9.16.4	Asphalt Concrete Wearing Course .....	72
3.9.17	Finishing Works Methods .....	73
3.10	Project Operation Activities .....	73
3.11	Resource Management .....	76
3.12	Waste Management .....	77
3.13	Employment .....	78
3.14	Land use / Land take and resettlement.....	79
3.15	Social Engagement .....	81
3.16	Construction Management .....	83
3.17	Operation Management.....	89
3.18	Operational Employment.....	89
<b>4</b>	<b>LEGAL FRAMEWORK .....</b>	<b>1</b>
4.1	National Legislation .....	1
4.1.1	General Serbian Legal Framework Related to the Project.....	1
4.1.2	Relevant Legal Framework for Environmental Matters .....	5
4.1.2.1	EIA Legislation .....	5
4.1.2.2	Water Qualitye .....	7
4.1.2.3	Air Quality .....	7
4.1.2.4	Soil Quality.....	7
4.1.2.5	Noise.....	8
4.1.2.6	Waste Management .....	8
4.1.2.7	Geology and Seismicity.....	8
4.1.2.8	Nature Conservation .....	9
4.1.3	Relevant Legal Framework for Social Matters .....	9
4.1.3.1	Assets .....	9
4.1.3.2	Expropriation.....	11
4.1.3.3	Labour and Working Conditions .....	14
4.1.3.4	Stakeholder Engagement.....	17
4.2	Lender Requirements.....	18
4.2.1	UKEF Requirements .....	18
4.2.2	MIGA Requirements.....	19
4.2.3	IFC Requirements .....	21
4.2.4	Equator Principles .....	23
4.3	Gaps between National EIA and International ESIA Processes.....	23
<b>5</b>	<b>BASELINE CONDITIONS .....</b>	<b>1</b>
5.1	Definition of the Area of Influence.....	1
5.1.1	Environmental Area of Influence .....	2
5.1.2	Social Area of Influence .....	3
5.2	Hydrology .....	5
5.2.1	Study Area .....	5
5.2.2	Methodology and Data Source .....	5
5.2.3	Baseline Conditions .....	7

5.2.4	Sensitive Receptors/Locations .....	25
5.3	Climate.....	28
5.3.1	Study Area .....	28
5.3.2	Methodology and Data Source .....	29
5.3.3	Baseline Conditions .....	33
5.3.3.1	Data .....	33
5.3.3.1.1	Global Data Assimilation System .....	33
5.3.3.1.2	5th Generation Reanalysis Data of European Centre for Medium Range Weather Forecast (ERA5) .....	36
5.3.4	Sensitive Receptors .....	50
5.4	Air Quality .....	50
5.4.1	Study Area .....	50
5.4.2	Methodology and Data Source .....	55
5.4.3	Baseline Conditions .....	55
5.4.4	Sensitive Receptors .....	61
5.5	Noise.....	61
5.5.1	Study Area .....	61
5.5.2	Methodology and Data Source .....	61
5.5.3	Baseline Conditions .....	62
5.5.4	Sensitive Receptors .....	64
5.6	Soil Quality .....	64
5.6.1	Study Area .....	64
5.6.2	Methodology and Data Source .....	66
5.6.3	Baseline Conditions .....	67
5.6.4	Sensitive Receptors .....	72
5.7	Water Quality .....	72
5.7.1	Study Area .....	72
5.7.2	Methodology and Data Source .....	74
5.7.3	Baseline Conditions .....	74
5.7.4	Sensitive Receptors .....	81
5.8	Terrestrial and freshwater ecology .....	81
5.8.1	Study Area .....	81
5.8.2	Methodology and Data Source .....	88
5.8.3	Baseline Conditions .....	101
5.8.3.1	Protected Areas .....	101
5.8.3.2	Terrestrial Flora and Ecosystems.....	106
5.8.3.3	Terrestrial Fauna.....	118
5.8.3.4	Aquatic Ecosystems.....	143
5.8.3.5	Ecosystem Services.....	151
5.8.4	Sensitive Receptors .....	151
5.9	Geology, tectonics and seismicity.....	153
5.9.1	Study Area .....	153

5.9.2	Methodology and Data Source .....	154
5.9.3	Baseline Conditions .....	154
5.9.4	Sensitive Receptors/Locations .....	162
5.10	Road traffic and transportation .....	164
5.10.1	Study Area .....	164
5.10.2	Methodology and Data Source .....	164
5.10.3	Baseline Conditions .....	165
5.10.4	Sensitive Receptors .....	167
5.11	Archaeological and cultural resources .....	168
5.11.1	Study Area .....	168
5.11.2	Methodology and Data Source .....	169
5.11.3	Baseline Conditions .....	169
5.11.4	Sensitive Receptors .....	173
5.12	Visual landscape, land use and soil types .....	173
5.12.1	Study Area .....	173
5.12.2	Methodology and Data Source .....	174
5.12.3	Baseline Conditions .....	174
5.12.3.1	Landscape .....	175
5.12.3.2	Land Use.....	179
5.12.3.3	Soil Types .....	180
5.12.4	Sensitive Receptors/Locations .....	181
5.13	Water Use (industrial, agriculture, domestic) .....	182
5.13.1	Study Area .....	182
5.13.2	Methodology and Data Source .....	182
5.13.3	Baseline Conditions .....	182
5.13.4	Sensitive Receptors .....	183
5.14	Social Baseline.....	183
5.14.1	Study Area .....	183
5.14.2	Methodology and Data Source .....	185
5.14.2.1	Primary Data Collection.....	186
5.14.2.1.1	Community Level Surveys (CLS) .....	186
5.14.2.1.2	Household Surveys (HHS) .....	187
5.14.2.1.3	Key Informant Interviews (KII) .....	187
5.14.2.1.4	Key Informant Interviews for the Land Acquisition.....	189
5.14.2.1.5	Focus Group Discussions (FGD).....	190
5.14.2.2	Secondary Data Collection .....	190
5.14.2.3	Sampling for the Social Impact Assessment.....	190
5.14.3	Baseline Conditions .....	192
5.14.3.1	Administrative Structure of Serbia .....	192
5.14.3.2	Population and Demography .....	193
5.14.3.2.1	Section 1: Čičevac Municipality .....	195
5.14.3.2.2	Section 1: Kruševac Municipality.....	197

5.14.3.2.3	Section 1: Varvarin Municipality .....	199
5.14.3.2.4	Section 2: Kraljevo Municipality .....	201
5.14.3.2.5	Section 2: Vrnjačka Banja Municipality .....	204
5.14.3.2.6	Section 2: Trstenik Municipality .....	206
5.14.3.2.7	Section 3: Čačak Municipality .....	208
5.14.3.2.8	Sensitive Receptors .....	211
5.14.3.3	Economy .....	211
5.14.3.3.1	Section 1: Ćićevac Municipality .....	212
5.14.3.3.2	Section 1: Kruševac Municipality .....	214
5.14.3.3.3	Section 1: Varvarin Municipality .....	216
5.14.3.3.4	Section 2: Kraljevo Municipality .....	218
5.14.3.3.5	Section 2: Vrnjačka Banja Municipality .....	220
5.14.3.3.6	Section 2: Trstenik Municipality .....	222
5.14.3.3.7	Section 3: Čačak Municipality .....	224
5.14.3.3.8	Sensitive Receptors .....	226
5.14.3.4	Ecosystem Services .....	226
5.14.3.4.1	Section 1: Ćićevac Municipality .....	226
5.14.3.4.2	Section 1: Kruševac Municipality .....	228
5.14.3.4.3	Section 1: Varvarin Municipality .....	230
5.14.3.4.4	Section 2: Kraljevo Municipality .....	232
5.14.3.4.5	Section 2: Vrnjačka Banja Municipality .....	235
5.14.3.4.7	Section 2: Trstenik Municipality .....	238
5.14.3.4.8	Section 3: Čačak Municipality .....	240
5.14.3.4.9	Sensitive Receptors .....	243
5.14.3.5	Health .....	243
5.14.3.5.1	Section 1: Ćićevac Municipality .....	243
5.14.3.5.2	Section 1: Kruševac Municipality .....	245
5.14.3.5.3	Section 1: Varvarin Municipality .....	247
5.14.3.5.4	Section 2: Kraljevo Municipality .....	249
5.14.3.5.5	Section 2: Vrnjačka Banja Municipality .....	251
5.14.3.5.6	Section 2: Trstenik Municipality .....	253
5.14.3.5.7	Section 3: Čačak Municipality .....	255
5.14.3.5.8	Sensitive Receptors .....	257
5.14.3.6	Education .....	257
5.14.3.6.1	Section 1: Ćićevac Municipality .....	258
5.14.3.6.2	Section 1: Kruševac Municipality .....	260
5.14.3.6.3	Section 1: Varvarin Municipality .....	262
5.14.3.6.4	Section 2: Kraljevo Municipality .....	264
5.14.3.6.5	Section 2: Vrnjačka Banja Municipality .....	267
5.14.3.6.6	Section 2: Trstenik Municipality .....	269
5.14.3.6.7	Section 3: Čačak Municipality .....	272
5.14.3.6.8	Sensitive Receptors .....	274

5.14.3.7	Infrastructure and Services .....	274
5.14.3.7.1	Section 1: Čičevac Municipality .....	274
5.14.3.7.2	Section 1: Kruševac Municipality .....	278
5.14.3.7.3	Section 1: Varvarin Municipality .....	281
5.14.3.7.4	Section 2: Kraljevo Municipality .....	283
5.14.3.7.5	Section 2: Vrnjačka Banja Municipality .....	289
5.14.3.7.6	Section 2: Trstenik Municipality .....	292
5.14.3.7.7	Section 3: Čačak Municipality .....	295
5.14.3.7.8	Sensitive Receptors .....	300
5.14.3.8	Land Use.....	300
5.14.3.8.1	Section 1: Čičevac Municipality .....	300
5.14.3.8.2	Section 1: Kruševac Municipality .....	300
5.14.3.8.3	Section 1: Varvarin Municipality .....	301
5.14.3.8.4	Section 2: Kraljevo Municipality .....	301
5.14.3.8.5	Section 2: Vrnjačka Banja Municipality .....	302
5.14.3.8.6	Section 2: Trstenik Municipality .....	302
5.14.3.8.7	Section 3: Čačak Municipality .....	303
5.14.3.8.8	Sensitive Receptors .....	303
5.14.3.9	Project Information Level.....	304
5.14.3.9.1	Project Information Level of the Community .....	304
5.14.3.9.2	Sensitive Receptors .....	308
5.14.3.10	Vulnerability .....	308
5.14.3.10.1	Section 1: Čičevac Municipality .....	309
5.14.3.10.2	Section 1: Kruševac Municipality .....	310
5.14.3.10.3	Section 1: Varvarin Municipality .....	312
5.14.3.10.4	Section 2: Kraljevo Municipality .....	312
5.14.3.10.5	Section 2: Vrnjačka Banja Municipality .....	314
5.14.3.10.6	Section 2: Trstenik Municipality .....	315
5.14.3.10.7	Section 3: Čačak Municipality .....	315
5.14.3.10.8	Sensitive Receptors .....	316
5.14.3.11	Human Rights Screening .....	317
<b>6</b>	<b>IMPACT ASSESSMENT .....</b>	<b>1</b>
6.1	Scooping of the Impacts.....	1
6.2	Methodology for Impact Assessment.....	6
6.2.1	Impact Types and Definitions .....	6
6.2.2	Method to Assess Environmental and Social Impacts .....	7
6.2.2.1	Determination of Impact Significance Criteria .....	7
6.2.2.2	Determination of Impact Likelihood .....	11
6.2.2.3	Determination of the Overall Impact .....	11
6.3	Water Quality .....	16
6.3.1	Surface Water .....	16
6.3.1.1	Construction Phase.....	16

6.3.1.2	Operation Phase .....	24
6.3.2	Groundwater .....	30
6.3.2.1	Construction Phase.....	30
6.3.2.2	Operation Phase .....	34
6.4	Air Quality and Climate.....	37
6.4.1	Construction Phase.....	37
6.4.2	Operation Phase .....	42
6.4.3	Overview of Greenhouse Gas Emissions Approach .....	46
6.4.3.1	Construction Phase.....	46
6.4.3.2	Operation Phase .....	47
6.4.3.3	Alternative Analysis.....	48
6.4.3.4	Monitoring & Reporting Requirements.....	51
6.4.3.5	Climate Change Adaptation .....	51
6.4.3.6	Assessment of GHG Contribution .....	55
6.5	Noise and Vibration.....	55
6.5.1	Construction Phase.....	59
6.5.2	Operation Phase .....	74
6.6	Geology and Soil.....	86
6.6.1	Construction Phase.....	86
6.6.2	Operation Phase .....	92
6.7	Resources and Waste .....	95
6.7.1	Construction Phase.....	99
6.7.2	Operation Phase .....	105
6.8	Terrestrial and Freshwater Ecology.....	109
6.8.1	Construction Phase.....	123
6.8.2	Operation Phase .....	135
6.9	Archaeological and Cultural Resources.....	139
6.10	Visual Landscape and Land Use.....	142
6.10.1	Construction Phase.....	144
6.10.2	Operation Phase .....	148
6.11	Social Impact Assessment .....	151
6.11.1	Population .....	152
6.11.1.1	Construction Phase.....	152
6.11.1.2	Operation Phase .....	162
6.11.2	Infrastructure.....	166
6.11.2.1	Construction Phase.....	166
6.11.2.2	Operation Phase .....	174
6.11.3	Economy.....	178
6.11.3.1	Construction Phase.....	178
6.11.3.2	Operation Phase .....	186
6.11.4	Resettlement and Land Acquisition .....	191
6.11.4.1	Construction and Operation Phase.....	191

6.11.5	Ecosystem Services .....	208
6.11.5.1	Construction Phase .....	208
6.11.5.2	Operation Phase .....	223
6.11.6	Labour and Working Conditions .....	226
6.11.6.1	Construction and Operation Phase.....	226
6.11.7	Occupational Health and Safety .....	235
6.11.7.1	Construction Phase .....	235
6.11.7.2	Operation Phase .....	241
6.11.8	Community Health and Safety .....	245
6.11.8.1	Construction Phase .....	245
6.11.8.2	Operation Phase .....	254
6.11.9	Vulnerable People .....	258
6.11.9.1	Construction and Operation Phase.....	258
<b>7</b>	<b>CUMULATIVE AND TRANSBOUNDARY IMPACTS.....</b>	<b>1</b>
7.1	Introduction .....	1
7.2	Guidance.....	1
7.3	Assessment Methodology .....	2
7.4	STEP 1 – Determination of Spatial and Temporal Boundaries .....	4
7.5	STEP 2 – Identification of VECs and Screening of Other Projects in Region .....	4
7.6	STEP 3 – Determine Existing Conditions of the VECs.....	7
7.7	STEP 4, STEP 5 and STEP 6 – Assesment of Cumulative Impacts and Identification of Mitigation Measures.....	7
7.8	Conclusion .....	28
7.9	Transboundary Impacts.....	28
<b>8.</b>	<b>ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN .....</b>	<b>1</b>
8.1	Objective and Scope .....	1
8.2	Roles and Responsibilities .....	2
8.3	Documentation and Reporting.....	3
8.3.1	External Reporting .....	4
8.3.2	Internal Reporting.....	4
8.4	ESMMP Review .....	4
8.5	Training .....	4
8.6	Monitoring .....	5
8.7	Legal Framework .....	5
8.8	Supporting Environmental and Social Management Plans .....	8
8.9	Environmental and Social Management and Monitoring .....	10
8.9.1	Environmental and Social Management .....	11
8.9.2	Environmental and Social Monitoring .....	93
8.10	Key Performance Indicators .....	117
<b>9</b>	<b>STAKEHOLDER ENGAGEMENT.....</b>	<b>1</b>
9.1	Objectives of Stakeholder Engagement.....	1
9.2	Roles and Responsibilities .....	1

9.3	Stakeholder Identification and Analysis .....	2
9.3.1	Vulnerable Groups .....	5
9.4	Previous and Planned Stakeholder Engagement Activities.....	7
9.4.1	Summary of the Social Field Studies for the ESIA Report .....	22
9.4.1.1	Population of the Area of Influence .....	22
9.4.1.2	Economy of the Area of Influence .....	23
9.4.1.3	Ecosystem Services of the Area of Influence .....	23
9.4.1.4	Cultural and Intangible Values of the Area of Influence .....	24
9.4.1.5	Project Information Level of the Area of Influence .....	25
9.4.1.6	Vulnerability Assessment of the Area of Influence.....	25
9.5	Stakeholder Engagement Program .....	26
9.6	Pre-Construction Phase .....	27
9.7	Construction Phase.....	30
9.8	Operation Phase .....	32
9.9	External Communications.....	33
9.10	Grievance Mechanism.....	34
9.10.1	Public Grievance Mechanism .....	34
9.10.2	Worker Grievance Mechanism .....	35
<b>10</b>	<b>CONCLUSION.....</b>	<b>1</b>
10.1	Impacts Summary .....	1
10.2	Additional Complementary Environmental and Social Studies.....	8

## LIST OF APPENDICES

Appendix – 1 Gap Assessment for Scoping Report in April 2019

Appendix – 2 Company Certifications and Qualifications

Appendix – 3 Stakeholder Engagement Plan

Appendix – 4 National Legislation and International Standards

Appendix – 5 Maps

- Appendix – 5.1 Location of Borrow Pits Map
- Appendix – 5.2 Measurement Locations Map
- Appendix – 5.3 Archaeological Points and Heritage Buildings Maps
- Appendix – 5.4 Soil Map
- Appendix – 5.5 Land Use Map
- Appendix – 5.6 Visibility Map
- Appendix – 5.7 Constraint Map

Appendix – 6 Analysis Report

Appendix – 7 Biodiversity Baseline Report

Appendix – 8 Air Quality Modelling Report

Appendix – 9 Acoustic Report

Appendix – 10 Hydrotechnical Regulation of the Zapadna Morava River within the  
Infrastructure Corridor of Highway E-761

Appendix – 11 Detailed Critical Habitat Assessment

Appendix – 12 Environment and Social Management System Framework

Appendix – 13 Non-Technical Summary

## LIST OF TABLES

	<u>Page</u>
Table 1-1. Key Stages for the ESIA Report .....	2
Table 1-2. The Sections of the Project.....	5
Table 1-3. Summary of the Project History .....	8
Table 1-4. Land Characteristics of the Alternative Routes .....	9
Table 1-5. National Environmental and Social Legal and Policy Framework.....	11
Table 1-6. International Finance Institutions' Requirements .....	13
Table 1-7. EUNIS Habitat Types .....	16
Table 1-8. Observed species within the Aol.....	17
Table 1-9. Municipalities Located in the Social Aol.....	18
Table 2-1. Sections of the Project.....	5
Table 2-2. ESIA Limitations and Assumptions – include general and specific limitations and assumptions that have influenced the preparation of the ESIA .....	9
Table 2-3. Key Stages for the ESIA Report .....	15
Table 2-4. Universities of the International Experts for Ecological Studies.....	16
Table 2-5. ESIA Report Structure .....	17
Table 3-1. Summary of the Project History .....	2
Table 3-2. Potentially critical locations along the proposed motorway route option.....	5
Table 3-3. Land Characteristics of the Alternative Routes .....	10
Table 3-4. The Sectors of the Project .....	12
Table 3-5. Project Location.....	13
Table 3-6. Different Design Criteria of Morava Corridor Motorway Elements .....	17
Table 3-7. Number of Bridges, Overpasses and Interchanges along the Sections of the Motorway.....	29
Table 3-8. List of Interchanges of the Morava Corridor Motorway Project.....	29
Table 3-9. Camps and Precast Yards.....	33
Table 3-10. Quarries and Borrow Pits.....	38
Table 3-11. Different Plants such as batch, asphalt, subbase, beam and screen and wash plants .....	41
Table 3-12. River Crossings (via Bridge) .....	46
Table 3-13. Pond Crossings .....	47
Table 3-14. Road Crossings.....	47
Table 3-15. Railway Crossings .....	48
Table 3-16. Powerline Crossings.....	48
Table 3-17. Gas Pipeline Crossings .....	49
Table 3-18. Motorway sections forecast AADT (vehicles/day) .....	74
Table 3-19. Financial effects-income from toll and commercial income (Million €).....	75
Table 3-20. Unit rates by basic vehicle type-category in Serbia.....	75
Table 3-21. Facilities for the operational phase of the Morava Corridor Motorway Project....	75
Table 3-22. Responsible Institutions on Land Acquisition & Expropriation .....	79
Table 3-23. Land Use Areas in Aol.....	80

Table 3-24. Land Use Areas for the Temporary Access Roads, Project Facilities and Motorway.....	80
Table 3-25. Past Stakeholder Engagement Activities within the Scope of ESIA Studies.....	82
Table 4-1. International Conventions and Agreements ratified by Serbia.....	2
Table 4-2. Related Information and Article within the Law .....	3
Table 4-3. Serbian Legal Framework on Habitats and Species, .....	9
Table 4-4. Law on Expropriation.....	11
Table 4-5. Gap Assessment of National EIA and International ESIA Processes.....	24
Table 5-1. Potential Social Impacts According to Settlements in the Area of Influence.....	4
Table 5-2. Municipalities Located in the Social AoI.....	4
Table 5-3. The Profiles which are considered during Hydrotechnical Study Report .....	9
Table 5-4. Maximum Flow Calculations based on RMHS Measurements.....	9
Table 5-5. The Calculated Values of the Maximum Annual Flow Qmax (m <sup>3</sup> /s) and Western Morava Flow for Typical Probabilities, p (%).....	12
Table 5-6. Category of Morphological Changes in the West Morava River .....	16
Table 5-7. The West Morava floodplain areas, discharge (Q100).....	24
Table 5-8. Coordinates and Station System MHE on the West Morava River.....	24
Table 5-9. Summary of Findings from the Hydrotechnical Study Report.....	26
Table 5-10. Meteorology Stations in the vicinity of the Proposed Motorway Route .....	29
Table 5-11. Average values of Climate parameters from 1980 to 2009 .....	30
Table 5-12. Physics Options used in WRF Initialization.....	31
Table 5-13. Average Monthly Pressure in Kruševac Between 1919-2019 .....	36
Table 5-14. Average Monthly Pressure in Kraljevo Between 1979-2019 .....	37
Table 5-15. Average Monthly Temperature in Kruševac Between 1979-2019 .....	39
Table 5-16. Average Monthly Temperature in Kraljevo Between 1979-2019 .....	40
Table 5-17. Average Monthly Wind Direction in Kruševac Between 1979-2019.....	42
Table 5-18. Average Monthly Wind Direction in Kraljevo Between 1979-2019.....	43
Table 5-19. Average Monthly Wind Velocity in Kruševac Between 1979-2019 .....	45
Table 5-20. Average Monthly Wind Velocity in Kraljevo Between 1979-2019 .....	46
Table 5-21. Annual Wind Count for Kraljevo.....	46
Table 5-22. Annual Wind Count for Kruševac.....	48
Table 5-23. Measuring Points for NO <sub>2</sub> , SO <sub>2</sub> and H <sub>2</sub> S and Noise for Section-1 .....	50
Table 5-24. Measuring Points for NO <sub>2</sub> , SO <sub>2</sub> and H <sub>2</sub> S and Noise for Section-2.....	51
Table 5-25. Measuring Points for NO <sub>2</sub> , SO <sub>2</sub> and H <sub>2</sub> S and Noise for Section-3.....	51
Table 5-26. Measuring Points for PM <sub>10</sub> and PM <sub>2.5</sub> for Section-1 .....	52
Table 5-27. Measurement Results of H <sub>2</sub> S, SO <sub>2</sub> , NO <sub>2</sub> , Toluene, Ethylbenzene, O-Xylene, P-M-Xylene, Benzene for Section-1 .....	57
Table 5-28. Measurement Results of H <sub>2</sub> S, SO <sub>2</sub> , NO <sub>2</sub> for Section-3.....	58
Table 5-29. Measurement Results for PM <sub>10</sub> and PM <sub>2.5</sub> .....	59
Table 5-30. Noise Measurement Results for Section-1.....	63
Table 5-31. Measurement Locations for Section-1 Soil Quality.....	65
Table 5-32. Measurement Locations for Section-2 Soil Quality.....	65

Table 5-33. Measurement Locations for Section-3 Soil Quality.....	66
Table 5-34. Measurement Results of Soil Sampling for Section-1 .....	68
Table 5-35. Measurement Results of Soil Sampling for Section-2 .....	69
Table 5-36. Measurement Results of Soil Sampling for Section-3 .....	70
Table 5-37. The Section Vise Exceedance Levels.....	71
Table 5-38. Measurement results of Sediment Quality .....	72
Table 5-39. Measurement Locations for Section-1 Surface Water Quality .....	73
Table 5-40. Measurement Locations for Section-2 Surface Water Quality .....	73
Table 5-41. Measurement Locations for Section-3 Surface Water Quality .....	73
Table 5-42. Classes of Surface Water Quality .....	75
Table 5-43. Classification of surface water bodies according to the Decree on the Categorization of Watercourses .....	75
Table 5-44. Types of Surface Water Quality .....	76
Table 5-45. Type Classification of Main Water Bodies in Aol of the Project .....	76
Table 5-46. Measurement Results of Water Sampling for Section-1 .....	78
Table 5-47. Measurement Results of Water Sampling for Section-2.....	78
Table 5-48. Measurement Results of Water Sampling for Section-3.....	79
Table 5-49. Limit Values of Some Parameters for Surface Water Quality Analysis.....	80
Table 5-50. Sampling Locations within each Section.....	82
Table 5-51. Coordinates of Sampling Locations .....	82
Table 5-52. Photo-Trap and Bat Sound Recording Study.....	99
Table 5-53. KBAs Located in vicinity of the Project Area .....	101
Table 5-54. List of EUNIS Level 3 Habitat Types.....	106
Table 5-55. Conservation Status of Flora Species.....	107
Table 5-56. Terrestrial Flora Species Identified in the Studies .....	109
Table 5-57. Conservation Status of Invertebrates.....	118
Table 5-58. Butterfly Species Identified in the Studies .....	120
Table 5-59. Dragonfly Species Identified in the Studies.....	121
Table 5-60. Other Insect Species Identified in the Studies.....	122
Table 5-61. Conservation Status of Amphibians and Reptiles .....	124
Table 5-62. Amphibian-Reptilian Species Identified in the Studies .....	127
Table 5-63. Conservation Status of Birds .....	130
Table 5-64. Bird Species Identified in the Studies.....	132
Table 5-65. Conservation Status of Mammals .....	137
Table 5-66. Mammal Species Identified in the Studies .....	139
Table 5-67. Conservation Status of Fishes.....	144
Table 5-68. Freshwater Fish Species and Their Protected Status Inhabited in Morava River .....	148
Table 5-69. Macrobenthic Organisms Inhabited in Morava River.....	150
Table 5-70. Sensitive Habitats.....	151
Table 5-71. Sensitive Flora and Fauna Species .....	151
Table 5-72. Seismic Terrain .....	161

Table 5-73. Section Pojate - Kruševac updated forecast 2018 .....	167
Table 5-74. Section: Kruševac (Koševi) - Adrani initial forecast 2011 .....	167
Table 5-75. Section Adrani - Mrčajevci - Preljina updated forecast 2018 .....	167
Table 5-76. Existing Roads intersected by the Project.....	168
Table 5-77. Railways intersected by the Project .....	168
Table 5-78. Archaeological Sites near to the Project Area .....	169
Table 5-79. Heritage Buildings near to the Project Area .....	171
Table 5-80. Land Use Areas in the Aol.....	180
Table 5-81. Municipalities located within the Study Area .....	184
Table 5-82. Settlements Located in the Study Area .....	184
Table 5-83. Surveys and Interviews Conducted by 2U1K.....	186
Table 5-84. Number of Business Surveys on each Affected Municipalities .....	189
Table 5-85. Details on the Focus Group Discussions .....	190
Table 5-86. List of Settlements and HH Sample Size .....	191
Table 5-87. Age Groups in Čičevac Municipality.....	195
Table 5-88. Demographic Characteristics of the Affected Villages in Čičevac Municipality .	196
Table 5-89. Age Groups in Kruševac Municipality .....	197
Table 5-90. Demographic Characteristics of the Affected Villages in Kruševac Municipality .....	198
Table 5-91. Age Groups in Varvarin Municipality .....	199
Table 5-92. Demographic Characteristics of the Affected Villages in Varvarin Municipality	200
Table 5-93. Age Groups in Kraljevo Municipality .....	201
Table 5-94. Demographic Characteristics of the Affected Villages in Kraljevo Municipality .	203
Table 5-95. Demographic Characteristics of the Affected Villages in Vrnjačka Banja Municipality .....	205
Table 5-96. Age Groups in Trstenik Municipality.....	206
Table 5-97. Demographic Characteristics of the Affected Villages in Trstenik Municipality .	207
Table 5-98. Age Groups in Čačak Municipality .....	208
Table 5-99. Demographic Characteristics of the Affected Villages in Čačak Municipality....	210
Table 5-100. Employment data of Čičevac Municipality .....	212
Table 5-101. Reasons of decrease in agricultural activities stated by the villagers .....	213
Table 5-102. Income sources of the affected villages in the Čičevac Municipality.....	214
Table 5-103. Employment data of Kruševac Municipality.....	215
Table 5-104. Economic Structures of the Villages in Kruševac Municipality.....	215
Table 5-105. Income sources of the affected villages in Kruševac Municipality .....	216
Table 5-106. Employment data of Varvarin Municipality .....	217
Table 5-107. Economic Structures of the Villages in Varvarin Municipality .....	217
Table 5-108. Sources of the affected villages in Varvarin Municipality.....	218
Table 5-109. Employment data of Kraljevo Municipality.....	218
Table 5-110. Economic Structures of the Villages in Kraljevo Municipality.....	219
Table 5-111. Income sources of the affected villages in Kraljevo Municipality .....	219
Table 5-112. Employment data of Vrnjačka Banja Municipality.....	220

Table 5-113. Economic Structures of the Villages in Vrnjačka Banja Municipality.....	221
Table 5-114. Income sources of the affected villages in Vrnjačka Banja Municipality .....	222
Table 5-115. Employment data of Trstenik Municipality .....	222
Table 5-116. Economic Structures of the Villages in Trstenik Municipality .....	223
Table 5-117. Income sources of the affected villages in Trstenik Municipality .....	223
Table 5-118. Employment data of Čačak Municipality .....	224
Table 5-119. Economic Structures of the Villages in Čačak Municipality .....	225
Table 5-120. Income sources of the affected villages in Čačak Municipality .....	225
Table 5-121. Ecosystem services in the Čičevac Municipality .....	227
Table 5-122. Ecosystem services in Čičevac Municipality .....	229
Table 5-123. Ecosystem services in Varvarin Municipality.....	231
Table 5-124. Ecosystem services in Kraljevo Municipality .....	233
Table 5-125. Ecosystem services in Vrnjačka Banja Municipality .....	237
Table 5-126. Ecosystem services in Trstenik Municipality .....	240
Table 5-127. Ecosystem services in the Čačak Municipality .....	242
Table 5-128. Health Indicators of the Čičevac Municipality .....	243
Table 5-129. Availability of health centers in affected villages of Čičevac Municipality .....	244
Table 5-130. Access to health facilities in affected villages of Čičevac Municipality .....	244
Table 5-131. Households with chronic diseases for each affected village in Čičevac Municipality .....	244
Table 5-132. Common chronic diseases of the affected villages of Čičevac Municipality.....	245
Table 5-133. Health Indicators of the Kruševac Municipality.....	245
Table 5-134. Availability of health centers in affected villages of Kruševac Municipality .....	246
Table 5-135. Access to health facilities in affected villages of Kruševac Municipality.....	246
Table 5-136. Households with chronic diseases for each affected village in Kruševac Municipality .....	246
Table 5-137. Common chronic diseases of the affected villages of Kruševac Municipality .....	247
Table 5-138. Health Indicators of the Varvarin Municipality .....	247
Table 5-139. Availability of health centers in affected villages of Varvarin Municipality .....	247
Table 5-140. Access to health facilities in affected villages of Varvarin Municipality .....	248
Table 5-141. Households with chronic diseases for each affected village in Varvarin Municipality .....	248
Table 5-142. Common chronic diseases of the affected villages of Varvarin Municipality .....	248
Table 5-143. Health Indicators of the Kraljevo Municipality.....	249
Table 5-144. Availability of health centers in affected villages of Kraljevo Municipality .....	249
Table 5-145. Access to health facilities in affected villages of Kraljevo Municipality.....	250
Table 5-146. Households with chronic diseases for each affected village in Kraljevo Municipality .....	250
Table 5-147. Common chronic diseases of the affected villages of Kraljevo Municipality .....	251
Table 5-148. Health Indicators of the Vrnjačka Banja Municipality.....	251
Table 5-149. Availability of health centers in affected villages of Vrnjačka Banja Municipality .....	252

Table 5-150. Access to health facilities in affected villages of Vrnjačka Banja Municipality.	252
Table 5-151. Households with chronic diseases for each affected village in Vrnjačka Banja Municipality .....	252
Table 5-152. Common chronic diseases of the affected villages of Vrnjačka Banja Municipality .....	253
Table 5-153. Health Indicators of the Trstenik Municipality .....	253
Table 5-154. Availability of health centers in affected villages of Trstenik Municipality .....	254
Table 5-155. Access to health facilities in affected villages of Trstenik Municipality .....	254
Table 5-156. Households with chronic diseases for each affected village in Trstenik Municipality .....	254
Table 5-157. Common chronic diseases of the affected villages of Trstenik Municipality .....	255
Table 5-158. Health Indicators of the Čačak Municipality .....	255
Table 5-159. Availability of health centers in affected villages of Čačak Municipality .....	256
Table 5-160. Access to health facilities in affected villages of Čačak Municipality .....	256
Table 5-161. Households with chronic diseases for each affected village in Čačak Municipality .....	256
Table 5-162. Common chronic diseases of the affected villages of Čačak Municipality .....	257
Table 5-163. Education Indicators of Ćićevac Municipality .....	258
Table 5-164. Education Indicators of Affected Villages in Ćićevac Municipality .....	259
Table 5-165. Education Indicators of Kruševac Municipality .....	260
Table 5-166. Education Indicators of Affected Villages in Kruševac Municipality .....	262
Table 5-167. Education Indicators of Varvarin Municipality .....	262
Table 5-168. Education Indicators of Affected Villages in Varvarin Municipality .....	264
Table 5-169. Education Indicators of Kraljevo Municipality .....	264
Table 5-170. Education Indicators of Affected Villages in Kraljevo Municipality .....	266
Table 5-171. Education Indicators of Vrnjacka Banja Municipality .....	267
Table 5-172. Education Indicators of Affected Villages in Vrnjačka Banja Municipality .....	269
Table 5-173. Education Indicators of Trstenik Municipality .....	269
Table 5-174. Education Indicators of Affected Villages in Trstenik Municipality .....	271
Table 5-175. Education Indicators of Čačak Municipality .....	272
Table 5-176. Education Indicators of Affected Villages in Trstenik Municipality .....	273
Table 5-177. Type of services available in each affected village of Ćićevac Municipality .....	274
Table 5-178. Available infrastructure services in affected villages of Ćićevac Municipality .....	275
Table 5-179. Household conditions of each affected settlements of Ćićevac Municipality .....	276
Table 5-180. Type of services available in each affected village of Kruševac Municipality .....	278
Table 5-181. Available infrastructure services in affected villages of Kruševac Municipality .....	279
Table 5-182. Household conditions of each affected settlements of Kruševac Municipality .....	279
Table 5-183. Type of services available in each affected village of Varvarin Municipality .....	281
Table 5-184. Available infrastructure services in affected villages of Varvarin Municipality .....	281
Table 5-185. Household conditions of each affected settlements of Varvarin Municipality .....	282
Table 5-186. Type of services available in each affected village of Kraljevo Municipality .....	283

Table 5-187. Available infrastructure services in affected villages of Kraljevo Municipality	284
Table 5-188. Household conditions of each affected settlements of Kraljevo Municipality	287
Table 5-189. Type of services available in each affected village of Vrnjačka Banja Municipality	289
Table 5-190. Available infrastructure services in affected villages of Vrnjačka Banja Municipality	290
Table 5-191. Household conditions of each affected settlements of Vrnjačka Banja Municipality	290
Table 5-192. Type of services available in each affected village of Trstenik Municipality	292
Table 5-193. Available infrastructure services in affected villages of Trstenik Municipality	293
Table 5-194. Household conditions of each affected settlements of Trstenik Municipality	294
Table 5-195. Type of services available in each affected village of Čačak Municipality	295
Table 5-196. Available infrastructure services in affected villages of Čačak Municipality	296
Table 5-197. Household conditions of each affected settlements of Čačak Municipality	298
Table 5-198. Land use of villages located in Čičevac Municipality	300
Table 5-199. Land use of villages located in Kruševac Municipality	300
Table 5-200. Land use of villages located in Varvarin Municipality	301
Table 5-201. Land use of villages located in Kraljevo Banja Municipality	301
Table 5-202. Land use of villages located in Vrnjačka Banja Municipality	302
Table 5-203. Land use of villages located in Trstenik Banja Municipality	302
Table 5-204. Land use of villages located in Čačak Municipality	303
Table 5-205. Vulnerability parameters	309
Table 5-206. Vulnerable groups in Čičevac Municipality	310
Table 5-207. Vulnerable groups in Kruševac Municipality	311
Table 5-208. Vulnerable groups in Varvarin Municipality	312
Table 5-209. Vulnerable groups in Kraljevo Municipality	313
Table 5-210. Vulnerable groups in Vrnjačka Banja Municipality	314
Table 5-211. Vulnerable groups in Trstenik Municipality	315
Table 5-212. Vulnerable groups in Čačak Municipality	316
Table 6-1. Scoping Matrix – Potential Environmental Impacts	3
Table 6-2. Scoping Matrix - Potential Social Impacts	5
Table 6-3. Impact Types and Definitions	6
Table 6-4. Criteria for Determining Impact Significance	8
Table 6-5. Likelihood Scoring	11
Table 6-6. Determination of the Overall Impact*	11
Table 6-7. Description of the Overall Impact Scores	11
Table 6-8. Hierarchy of Options for Mitigation	12
Table 6-9. Assessment of Potential Impacts (As an example)	15
Table 6-10. Impact and Mitigations for Surface Water Quality in Construction Phase of the Project	18
Table 6-11. Scoring of Surface Water Impacts in Construction Phase	23

Table 6-12. Impact and Mitigations for Surface Water Quality in Operation Phase of the Project.....	25
Table 6-13. Scoring of Surface Water Impacts in Operation Phase .....	29
Table 6-14. Impact and Mitigations for Groundwater Quality in Construction Phase of the Project.....	31
Table 6-15. Scoring of Groundwater Impacts in Construction Phase.....	33
Table 6-16. Impact and Mitigations for Groundwater Quality in Operation Phase of the Project.....	35
Table 6-17. Scoring of Groundwater Impacts in Operation Phase .....	36
Table 6-18. Construction Phase APCV Determined from the Modeling Studies .....	38
Table 6-19. Impact and Mitigations for Air Quality and Climate in Construction Phase of the Project.....	39
Table 6-20. Scoring of Air Quality and Climate Impacts in Construction Phase .....	41
Table 6-21. Operation Phase APCV Determined from the Modeling Studies.....	42
Table 6-22. Impact and Mitigations for Air Quality and Climate in Operation Phase of the Project.....	44
Table 6-23. Scoring of Air Quality and Climate Impacts in Operation Phase.....	45
Table 6-24. Major GHG Emissions during Construction Period .....	47
Table 6-25. Major Annual GHG Emissions during Operation Period.....	48
Table 6-26. Receiver Information .....	56
Table 6-27. Sound Power Level of Construction Phase .....	60
Table 6-28. Sound Power Level of Plants.....	61
Table 6-29. Assessment Ldn for Construction Phase .....	62
Table 6-30. Blasting Calculations at Quarry Areas.....	66
Table 6-31. Reference Vibration Levels for Machine and Equipment.....	67
Table 6-32. Impact and Mitigations for Noise and Vibration in Construction Phase of the Project.....	69
Table 6-33. Scoring of Ambient Noise and Vibration Impacts in Construction Phase.....	73
Table 6-34. Assessment Ldn, for Operation .....	76
Table 6-35. Geometrical Information about Recommended Noise Barriers.....	78
Table 6-36. Final Impact Significance after Mitigation of the Noise Receivers that had “Major” Impact .....	78
Table 6-37. Ground Scaling Factors and Power Coefficients for Different Soils (Watts and Krylov, 2000).....	80
Table 6-38. Impact Assessment for Operational Vibration .....	81
Table 6-39. Impact and Mitigations for Noise and Vibration in Operation Phase of the Project .....	84
Table 6-40. Scoring of Ambient Noise and Vibration Impacts in Operation Phase .....	85
Table 6-41. Impact and Mitigations for Geology and Soil in Construction Phase of the Project .....	88
Table 6-42. Scoring of Geology and Soil Impacts in Construction Phase .....	91
Table 6-43. Impact and Mitigations for Geology and Soil in Operation Phase of the Project.....	93

Table 6-44. Scoring of Geology and Soil Impacts in Operation Phase.....	94
Table 6-45. Amount of Water Use during Construction.....	96
Table 6-46. Impact and Mitigations for Waste Generation in Construction Phase of the Project.....	101
Table 6-47. Scoring of Waste Generation Impacts in Construction Phase.....	104
Table 6-48. Impact and Mitigations for Waste Generation in Operation Phase of the Project .....	106
Table 6-49. Scoring of Waste Management Impacts in Construction Phase.....	108
Table 6-50. Potential Impacts of the Project on Biological Environment .....	110
Table 6-51. Habitat Sensitivity and Habitat Loss due to Project.....	112
Table 6-52. Detailed Habitat Loss due to Each Project Component.....	113
Table 6-53. Impact on Terrestrial and Freshwater Ecology (Construction Phase).....	124
Table 6-54. Impacts Scoring on Terrestrial and Freshwater Ecology (Construction Phase)	134
Table 6-55. Impacts on Terrestrial and Freshwater Ecology (Operation Phase) .....	136
Table 6-56. Impacts Scoring on Terrestrial and Freshwater Ecology (Operation Phase) ....	138
Table 6-57. Impact and Mitigations for Archaeological Cultural Resources and in Construction Phase of the Project .....	140
Table 6-58. Scoring of Impact on Archaeological and Cultural Resources.....	141
Table 6-59. Recreational Areas .....	142
Table 6-60. Impact on Visual Landscape (Construction Phase).....	145
Table 6-61. Impacts Scoring on Impact on Visual Landscape (Construction Phase) .....	147
Table 6-62. Impacts on Impact on Visual Landscape (Operation Phase).....	149
Table 6-63. Impacts Scoring on Impact on Visual Landscape (Operation Phase).....	150
Table 6-64. Impacts on Population (Construction Phase).....	157
Table 6-65. Impacts Scoring on Population (Construction Phase).....	161
Table 6-66. Impacts on Population (Operation Phase) .....	164
Table 6-67. Impacts Scoring on Population (Operation Phase) .....	165
Table 6-68. Density of the doctors in each affected municipality.....	166
Table 6-69. Affected villages within the borders of Social Aol without health services .....	167
Table 6-70. Infrastructure shortages According to Spatial Plan .....	168
Table 6-71. Impacts on Infrastructure (Construction Phase).....	170
Table 6-72. Impacts Scoring on Infrastructure (Construction Phase).....	173
Table 6-73. Impacts on Infrastructure (Operation Phase) .....	176
Table 6-74. Impacts Scoring on Infrastructure (Operation Phase) .....	177
Table 6-75. Unemployment Ratios of the Municipalities .....	178
Table 6-76. Available skills of the PAPs .....	179
Table 6-77. Impacts on Economy (Construction Phase).....	182
Table 6-78. Impacts Scoring on Economy (Construction Phase).....	185
Table 6-79. Impacts on Economy (Operation Phase) .....	189
Table 6-80. Impacts Scoring on Economy (Operation Phase) .....	190
Table 6-81. Responsible Institutions on Land Acquisition & Expropriation .....	192
Table 6-82. Land Use Areas in Aol.....	192

Table 6-83. Potential Impacts Caused by the Economic and Physical Displacements.....	193
Table 6-84. Impacts on Resettlement and Land Acquisition (Construction and Operation Phase).....	203
Table 6-85. Impacts Scoring on Resettlement and Land Acquisition (Construction and Operation Phase) .....	207
Table 6-86. Required Forest Lands and the Forest Usage within the Municipalities .....	209
Table 6-87. Tourism activities within the Aol.....	212
Table 6-88. Areas of the River Regulation .....	213
Table 6-89. Purpose of River Usage.....	214
Table 6-90. Impacts on Ecosystem Services (Construction Phase).....	220
Table 6-91. Impacts Scoring on Ecosystem Services (Construction Phase) .....	222
Table 6-92. Impacts on Ecosystem Services (Operation Phase) .....	224
Table 6-93. Impacts Scoring on Ecosystem Services (Operation Phase) .....	225
Table 6-94. Impacts on Labour and Working Conditions (Construction and Operation) .....	230
Table 6-95. Impacts Scoring on Labour and Working Conditions (Construction and Operation Phase).....	234
Table 6-96. Impacts on Occupational Health and Safety (Construction phase) .....	237
Table 6-97. Impacts Scoring on Occupation Health and Safety (Construction Phase).....	240
Table 6-98. Impacts on Occupational Health and Safety (Operation Phase) .....	242
Table 6-99. Impacts Scoring on Occupation Health and Safety (Operation Phase) .....	244
Table 6-100. Number of Vehicles proposed during Construction Phase .....	245
Table 6-101. Impacts on Community Health and Safety (Construction Phase).....	248
Table 6-102. Impacts Scoring on Community Health and Safety (Construction Phase) .....	253
Table 6-103. Number of Bridges, Overpasses and Interchanges along the Sections of the Motorway.....	254
Table 6-104. Impacts on Community Health and Safety (Operation Phase) .....	256
Table 6-105. Impacts Scoring on Community Health and Safety (Operation Phase) .....	257
Table 6-106. Impacts on Vulnerable Groups (Construction and Operation Phase).....	260
Table 7-1. The VECs in the Project Area.....	5
Table 7-2. Potential Projects in the Region.....	6
Table 7-3. Cumulative Impact Assessment and Mitigation Measures .....	8
Table 8-1. Roles and Responsibilities.....	2
Table 8-2. National Environmental and Social Legal and Policy Framework.....	5
Table 8-3. International Finance Institutions' Requirements .....	7
Table 8-4. Environmental and Social Management and Monitoring Plan (Construction Phase) .....	11
Table 8-5. Environmental and Social Management and Monitoring Plan (Operation Phase) .....	75
Table 8-6. Key Performance Indicators .....	117
Table 9-1. Roles and Responsibilities.....	2
Table 9-2. List of Stakeholders .....	4
Table 9-3. Potential Vulnerable Groups.....	5
Table 9-4. Past Stakeholder Engagement Activities within the Scope of ESIA Studies.....	7

Table 9-5. Surveys and Interviews Conducted by 2U1K.....	22
Table 9-6. Pre-Construction Phase Stakeholder Engagement Activities.....	28
Table 9-7. Construction Phase Stakeholder Engagement Activities.....	30
Table 9-8. Operation Phase Stakeholder Engagement Activities.....	32
Table 10-1. ESIA Impact Assessment Summary .....	1
Table 10-2. Complementary Environmental and Social Studies .....	8

## LIST OF FIGURES

	<u>Page</u>
Figure 2-1. Project Alignment.....	3
Figure 2-2. General Project Alignment.....	5
Figure 2-3. EIA Procedure in Serbia.....	13
Figure 2-4. National and International Experts Under the Coordination of 2U1K International .....	16
Figure 3-1. The route and Cross-section of Flood Relief Channels.....	9
Figure 3-2. Variant Options at Sector-2 .....	10
Figure 3-3. Route Map of Section-1.....	14
Figure 3-4. Route Map of the first part of Section-2 .....	15
Figure 3-5. Route Map of the second part of Section-2.....	15
Figure 3-6. Route Map of Section-3.....	16
Figure 3-7. Typical Cross-Section of the Regulated Channel.....	19
Figure 3-8. River Regulation Typical Drawings .....	22
Figure 3-9. The route and typical cross-section of the Structure 1, Section-1 .....	24
Figure 3-10. The route and typical cross-section of the Structure 2, Section-1 .....	25
Figure 3-11. The route and typical cross-section of the Structure 3, Section-1 .....	26
Figure 3-12. The route and typical cross-section of the Structure 4, Section-1 .....	27
Figure 3-13. Typical cross-section of the Structure 17, Section-3.....	28
Figure 3-14. Sketches of the Interchanges planned along the Motorway.....	30
Figure 3-15. Sketches of the Interchanges planned along the Motorway.....	31
Figure 3-16. Sketches of the Interchanges planned along the Motorway.....	32
Figure 3-17. Camp Area – 1 in Section-1.....	33
Figure 3-18. Layout of Camp Area in Section-1 (Krusevac).....	34
Figure 3-19. Camp Area – 2 in Section-2.....	35
Figure 3-20. Camp Area – 3 in Section-3.....	35
Figure 3-21. Precast Yard-1 .....	36
Figure 3-22. Precast Yard-2 .....	36
Figure 3-23. Precast Yard-3 .....	37
Figure 3-24. Precast Yard-4 .....	37
Figure 3-25. Precast Yard-5 .....	38
Figure 3-26. Quarry with Crusher-1 .....	39
Figure 3-27. Quarry with Crusher-2 .....	39
Figure 3-28. Quarry with Crusher-3 .....	40

Figure 3-29. Quarry .....	40
Figure 3-30. Beam Plant-1 .....	41
Figure 3-31. Batch Plant-1, Asphalt Plant-1, Beam Plant-2 and Subbase Plant-1.....	42
Figure 3-32. Asphalt Plant-2 and Subbase Plant-2 .....	42
Figure 3-33. Beam Plant-3 .....	43
Figure 3-34. Beam Plant-4 .....	43
Figure 3-35. Screen and Wash Plant-1.....	44
Figure 3-36. Screen and Wash Plant-2.....	44
Figure 3-37. Screen and Wash Plant-4.....	45
Figure 3-38. Typical Cross Section of Access Roads .....	46
Figure 3-39. Example of Reno Mattress .....	53
Figure 3-40. Example of Riparian Vegetation Formation .....	53
Figure 3-41. Tentative List of Construction Equipment .....	55
Figure 3-42. Photos from Typical Clearing and Grubbing Works .....	56
Figure 3-43. Topsoil Excavation and Stockpiling within the Alignment.....	56
Figure 3-44. Similar Excavation Photos.....	58
Figure 3-45. Example of Excavation and Hauling as well as Compaction Works along the Alignment .....	58
Figure 3-46. Example of Replacing of Embankment Formation (Foundation) with Geotextile and Suitable Material.....	59
Figure 3-47. Excavation Procedure Using Blasting Technique .....	59
Figure 3-48. Typical Pictures from Excavation Procedure Using Blasting Technique. ....	60
Figure 3-49. Spreading and Compaction of Gravel and Earth Materials .....	61
Figure 3-50. Pile Casting.....	62
Figure 3-51. Lean Concrete Placement for Stepped Structural Foundation .....	63
Figure 3-52. Foundation Concreting Operation.....	64
Figure 3-53. Abutment Wall Ready for Concreting.....	64
Figure 3-54. Pier Concreting .....	65
Figure 3-55. Specialist Trailer Transportation .....	66
Figure 3-56. Preparation of Beam Installation.....	67
Figure 3-57. Lagoon Construction .....	68
Figure 3-58. Drainage Components' Installation and Finishing Works .....	69
Figure 3-59. Sub-base and Ditches Construction and Finishing Works .....	71
Figure 3-60. Drumrollers Compact the Asphalt Layer .....	72
Figure 3-61. Finishing Works.....	73
Figure 3-62. Construction Employment Projection.....	78
Figure 3-63. Construction Time Schedule (for all sectors) .....	84
Figure 3-64. Construction Time Schedule (for all sectors) (Continue).....	85
Figure 3-65. Construction Time Schedule (for all sectors) (Continue).....	86
Figure 3-66. Proposed Construction Management Organization Structure .....	88
Figure 4-1. The EIA Procedure in Serbia.....	6
Figure 5-1. Environmental Area of Influence.....	3

Figure 5-2. West Morava Basin and the Morava Motorway Project Hydrotechnical Study Area .....	6
Figure 5-3. Basin Map of the Project Area.....	7
Figure 5-4. Absolute Annual Maximum Flows of Western Morava on Profiles H.S. Miločaj and H.S. Jasika in the Period of Observation .....	11
Figure 5-5. Calculation Values of Maximum Annual Flows of the Western Morava H.Š. Miločaj with a 95% Confidence Interval .....	13
Figure 5-6. Calculation Values of Maximum Annual Flows of the Western Morava H.Š. Jasika with a 95% Confidence Interval .....	13
Figure 5-7. Calculation Values of Maximum Annual Flow of the River Ibar Hydrological Station.....	14
Figure 5-8. Calculation Values of Maximum Annual Flow of the River Rasina Hydrological..	14
Figure 5-9. Example of Stable Section, from km 46 to km 52 .....	18
Figure 5-10. Example of Unstable Section, from km 30 to km 38 .....	18
Figure 5-11. Example of Unstable Sections from km 87 to km 92.....	19
Figure 5-12. Condition Troughs from km 30 to km 35, a Large Number of Borrow Pits .....	19
Figure 5-13. Condition Trough from km 42 to km 44, Slitting of the Meander km 44-46.....	20
Figure 5-14. Condition Troughs from km 59 to km 65.....	20
Figure 5-15. Condition Troughs from 87 km to 92 km, a Large Number of Borrow Pits .....	21
Figure 5-16. Examples of Localities with Pronounced Fluvial Coastal Erosion (left km 42, right km 100) .....	23
Figure 5-17. The Existing Embankments (left km 75, right km 120).....	23
Figure 5-18. Cascade Run of River Type Dams on the West Morava River.....	25
Figure 5-19. The Proposed Motorway Route and the locations of meteorology stations.....	29
Figure 5-20. Average Daily Moisture in Kraljevo .....	33
Figure 5-21. Average Daily Pressure in Kraljevo .....	34
Figure 5-22. Average Daily Wind Velocity in Kraljevo .....	34
Figure 5-23. Average Daily Wind Direction in Kraljevo .....	35
Figure 5-24. Average Daily Temperature in Kraljevo .....	35
Figure 5-25. Average Monthly Pressure in Kruševac.....	36
Figure 5-26. Average Monthly Pressure in Kraljevo.....	37
Figure 5-27. Average Pressure Map.....	38
Figure 5-28. Average Monthly Temperature in Kruševac.....	39
Figure 5-29. Average Monthly Temperature in Kraljevo.....	40
Figure 5-30. Average Temperature Map.....	41
Figure 5-31. Average Monthly Wind Direction in Kruševac.....	42
Figure 5-32. Average Monthly Wind Direction in Kraljevo.....	43
Figure 5-33. Average Wind Map.....	44
Figure 5-34. Average Monthly Wind Velocity in Kruševac.....	45
Figure 5-35. Average Monthly Wind Velocity in Kraljevo.....	46
Figure 5-36. Wind Diagram for Kraljevo.....	48
Figure 5-37. Wind Diagram for Kraljevo.....	49

Figure 5-38. All Measurement Points within the scope of Environmental Baseline Studies...	54
Figure 5-39. Soil Map of Serbia .....	67
Figure 5-40. Biodiversity Sampling Points (Section-1) .....	84
Figure 5-41. Biodiversity Sampling Points (Section-2) .....	85
Figure 5-42. Biodiversity Sampling Points (Section-2) .....	86
Figure 5-43. Biodiversity Sampling Points (Section-3) .....	87
Figure 5-44. Flora Expert and Local Botanists in the Survey Area .....	92
Figure 5-45. Searching and Photographing for Invertebrates .....	95
Figure 5-46. Searching for Reptile Species Underneath the Rocks .....	96
Figure 5-47. Bird observation and photographing .....	97
Figure 5-48. Key Biodiversity Areas in the vicinity of the Aol .....	104
Figure 5-49. Osredak Nature Reserve in the vicinity of the Aol.....	105
Figure 5-50. Ratio of the Habitats within the Aol.....	106
Figure 5-51. Important Wintering-Bird Areas Recommended in Serbia by Local Birdwatchers .....	131
Figure 5-52. Geological Formations in Serbia and Project Location.....	155
Figure 5-53. General Geological Map of Project Area .....	157
Figure 5-54. Mediterranean-Trans-Asian Seismic Zone.....	159
Figure 5-55. Seismo-tectonic Map of Serbia and Project area .....	160
Figure 5-56. Map of the Motorway E-761.....	166
Figure 5-57. Monumental Tree in KP32.....	172
Figure 5-58. Manumental Tree in KP 100.....	173
Figure 5-59. Agricultural field.....	176
Figure 5-60. Forest Areas.....	177
Figure 5-61. The West Morava River and Riparian Vegetation .....	178
Figure 5-62. Artificial Ponds .....	179
Figure 5-63. Map of Serbia.....	194
Figure 5-64. Villages located in the Čičevac Municipality.....	196
Figure 5-65. Villages located in the Kruševac Municipality .....	198
Figure 5-66. Villages located in the Varvarin Municipality .....	200
Figure 5-67. Villages located in the Kraljevo Municipality .....	201
Figure 5-68. Villages located in the Vrnjačka Banja Municipality .....	205
Figure 5-69. Villages located in the Trstenik Municipality.....	207
Figure 5-70. Villages located in the Čačak Municipality .....	209
Figure 5-71. The size of the forest lands within the borders of the Kruševac .....	228
Figure 5-72. The size of the forest lands within the borders of the Varvarin.....	230
Figure 5-73. The size of the forest lands within the borders of the Kraljevo .....	232
Figure 5-74. The size of the forest lands within the borders of the Vrnjačka Banja .....	236
Figure 5-75. The size of the forest lands within the borders of the Trstenik .....	239
Figure 5-76. The size of the forest lands within the borders of the Čačak.....	241
Figure 5-77. Unsanitary Landfill Located in Čičevac Municipality.....	277
Figure 5-78. Unsanitary Landfill Located in Kraljevo Municipality .....	285

Figure 5-79. The main information tools of the Project Affected People.....	308
Figure 6-1. Vibration Critical Distance for Main Motorway Construction Activities.....	67
Figure 6-2. Operational Vibration - PPV vs Distance .....	81
Figure 6-3. Recreational Areas.....	143
Figure 6-4. Workers Accommodation Location for Section-1 .....	153
Figure 6-5. Workers Accommodation Location for Section-2 .....	154
Figure 6-6. Workers Accommodation Location for Section-3 .....	155
Figure 6-7. Land Types According to the Ownership Status .....	195
Figure 6-8. Expropriation Route and Location of the Project Facilities for Section .....	196
Figure 6-9. Expropriation Route and Location of the Project Facilities for Section 2 .....	198
Figure 6-10. Expropriation Route and Location of the Project Facilities for Section 2-a .....	199
Figure 6-11. Expropriation Route and Location of the Project Facilities for Section 3 .....	201
Figure 6-12. Beehives in Mrzenica .....	210
Figure 6-13. Beehives in Mrzenica and Makrasene .....	211
Figure 6-14. Monument Tree Located in Bela Voda Village.....	217
Figure 6-15. Monument Tree Located in Donja Gorevnica .....	218
Figure 7-1. Steps of RCIA .....	3
Figure 7-2. Potential Projects in the Region.....	6

## LIST OF ABBREVIATIONS

<b>2U1K</b>	2U1K Engineering & Consulting Inc.
<b>AFs</b>	associated facilities
<b>AoI</b>	Area of Influence
<b>APCV</b>	Air Pollution Contribution Values
<b>BEJV</b>	Bechtel Enka Joint Venture
<b>BT</b>	Near Threatened
<b>CCF</b>	Chain of Custody Form
<b>CHMP</b>	Cultural Heritage Management Plan
<b>CIA</b>	Cumulative Impact Assessment
<b>CIP</b>	Institute of Transportation
<b>CLC</b>	CORINE Land Cover
<b>CM</b>	Construction Manager
<b>COD</b>	Chemical Oxygen Demand
<b>CoS</b>	Corridors of Serbia
<b>CRO</b>	Community Relations Officer
<b>CRSD</b>	Community Relations and Sustainability Department
<b>DTM</b>	Digital Terrain Model
<b>ECA</b>	United Kingdom's Export Credit Agency
<b>EIA</b>	Environmental Impact Assessment
<b>EP</b>	Equator Principles
<b>EPAQS</b>	Expert Panel on Air Quality Standards
<b>EPR</b>	Emergency Response Plan
<b>ESDAC</b>	European Soil Data Center
<b>ESH</b>	Environmental, Safety and Health
<b>ESHR</b>	Environmental and Social Human Rights
<b>ESIA</b>	Environmental and Social Impact Assessment
<b>ESMMP</b>	Environmental and Social Management and Monitoring Plan
<b>ESMS</b>	Environmental and Social Management System
<b>ESSs</b>	Environmental and Social Standards
<b>EU</b>	EU European Union
<b>EUNIS</b>	European Nature Information System
<b>FGD</b>	Focus Group Discussions

<b>GDAS</b>	Global Data Assimilation System
<b>GFS</b>	Global Forecast System
<b>GHG</b>	Greenhouse Gas
<b>GM</b>	Grievance Mechanism
<b>HS</b>	Hydrological Station
<b>HSEP</b>	Health, Safety and Environmental Plan
<b>IBAs</b>	Important Bird Areas
<b>IFC</b>	International Finance Corporation
<b>IFI</b>	International Financial Institutions
<b>IJC</b>	The Jaroslav Černi Water Institute
<b>ILO</b>	International Labour Organisation
<b>IPAs</b>	Important Plant Areas
<b>KBAs</b>	Key Biodiversity Areas
<b>KPs</b>	Kilometer Points
<b>LC</b>	Least Concern
<b>MIGA</b>	Multilateral Investment Guarantee Agency
<b>MoCTI</b>	Ministry of Construction, Transport and Infrastructure
<b>MSK</b>	Medvedev, Spanheuer and Karnik
<b>NCEP</b>	National Centres for Environmental Prediction
<b>NGO</b>	Non-Governmental Organizations
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>PAP</b>	Project Affected People
<b>PEMP</b>	Project Environmental Management Plan
<b>PM</b>	Project Manager
<b>PPM</b>	Public Participation Meeting
<b>PS</b>	Performance Standards
<b>RCIA</b>	Rapid Cumulative Impact Assessment
<b>RMHS</b>	Republic Hydro meteorological Service of Serbia
<b>RoS</b>	Roads of Serbia
<b>SAoI</b>	Social Area of Influence
<b>SEP</b>	Stakeholder Engagement Plan
<b>SMA</b>	Stone Mastic Asphalt

<b>TCNs</b>	Third Country Nationals
<b>UKEF</b>	UK Export Finance
<b>VECs</b>	valued ecosystem components
<b>VU</b>	Vulnerable
<b>WB</b>	World Bank
<b>WHO</b>	World Health Organization
<b>WMP</b>	Waste Management Plan
<b>WRF</b>	Weather Research and Forecasting