

# INITIAL ENVIRONMENTAL EXAMINATION REPORT

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Project Number: 45169-002

Loan Number: TA-8107 KGZ

August 2013

**CAREC Transport Corridor 3  
(Bishkek – Osh Road Improvement Project, Phase 4)**

## **Section Bishkek to Kara Balta**

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Prepared By the KOCKS Consult GmbH for ADB and Ministry of Transport and Communications of the Kyrgyz Republic. Initial Environmental Examination Report is a document of Borrower

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## ABBREVIATIONS

ADB	-	Asian Development Bank
Aids	-	Acquired immune deficiency syndrome
AP	-	Affected People
CAREC	-	Central Asia Regional Economic Cooperation
CSC	-	Construction Supervision Consultant
EMP	-	Environmental Management Plan
GRM	-	Grievance Redress Mechanism
HIV	-	Human Immune Deficiency Virus
IPIG	-	Investment Project Implementation Group
IEE	-	Initial Environmental Examination
IPIG	-	Investment Projects Implementation Group
KM	-	Kilometer
LAR	-	Land Acquisition and Resettlement
MoTC	-	Ministry of Transport and Communication of the Kyrgyz Republic
NGO	-	Non-Governmental Organization
PAP	-	Project-Affected Person
PCU	-	Passenger Car Unit
PPTA	-	Project Preparatory Technical Assistance
RAP	-	Resettlement Action Plan
RoW	-	Right-of-Way
RP	-	Resettlement Plan
SA	-	Social Assessment
STD	-	Sexually Transmitted Disease
SSEMP	-	Site Specific Environmental Plan
TA	-	Technical Assistance
TOR	-	Terms of Reference
USD	-	United States Dollar
VAT	-	Value Added Tax
VOC	-	Vehicle Operating Cost

## EXECUTIVE SUMMARY

1. The Government of the Kyrgyz Republic has requested the Asian Development Bank (ADB) to identify, formulate, and prepare an ensuing loan and/or grant for the CAREC Corridor (Bishkek-Osh) Improvement Project. This Initial Environmental Examination (IEE) has been prepared as part of the feasibility study for the project. The study covers section Bishkek to Kara Balta (60km).
2. The proposed project will improve connectivity and access to markets in Kyrgyz Republic. The outcome of the project will be efficient movement of freight and passenger traffic along the Bishkek-Osh road. According to the categorization of ADB Safeguard Policy Statement, the project belongs to category “B” and doesn’t require full Environmental Impact Assessment (EIA). According to the legislation of Kyrgyz Republic the project doesn’t require EIA but it requires State Environmental Expertise (SEE).
3. This report includes background information on Kyrgyz Republic, relevant legislation and the project area. It includes a detailed description of the proposed project and describes the current condition of the environment in the project area. Different environmentally sensitive receptors were identified and the impacts of the project have been analyzed from the perspective of the receptors. Suitable mitigation measures have been identified to reduce the anticipated impacts to the technically possible minimum and an Environmental Management Plan (EMP) has been prepared accordingly.
4. Impacts from the project are expected to be limited in magnitude and spatially. As most of the impacts are confined to the construction stage of the Project certain impacts also occur in the operational stage. These impacts are due to increased traffic volume and vehicle speed and refer to elevated levels of gaseous and noise emissions and potentially increased pedestrian vs. vehicle accidents. In addition there is an increased risk of accidents with possible spills of harmful substances. The identified impacts include (i) noise impacts, emission of pollutants to air and vibration, which is especially of high significance within the settlements alongside the Project road and where sensitive receptors are located such as schools, hospitals mosques or other, e.g. households located near the road and others like camp sites and quarries, bazaar, cultural and historical properties, major conjunctions (ii) impacts on water courses and rivers (iii) impacts from aggregate sourcing at borrow sites; (iv) impacts on soil and vegetation, inclusive tree plantations alongside the Project road due to site clearance activities; (v) impacts from bridge and drainage facilities rehabilitation; (vi) impacts from asphalt plant and aggregate crushers and (vii) impacts from contractor's working camps. Impacts have been divided in to design phase, construction phase, and operation phase impacts.
5. Mitigation measures for each of the impacts have been developed and incorporated into the Environmental Management Plan (EMP). In addition the contractor will have to prepare and submit to IPIG and to the Construction Supervision Consultant a Site Specific Environmental Management Plan (SSEMP) covering the following aspects: (i) Dust management ; (ii) Layout of the work camp; (iii) Sewage disposal; (iv) Waste and oil disposal; (v) Description and layout of equipment maintenance and storage facilities; (vi) Soil management (top soil storage and reuse); (vii) Emergency response plan; and (viii) Method statement for bridge reconstruction works. The SSEMP shall be approved by the Construction Supervision Consultant.

## I. INTRODUCTION

### A. Background

6. ADB contracted the Joint Venture consisting of Kocks Consult GmbH and Central Asian Consulting Center as a consultant for TA-8107 KGZ: CAREC Corridor 3 (Bishkek-Osh Road) Improvement Project, Phase 4 (45169-002) in November 2012. The Initial Environmental Examination (IEE) is part of the Feasibility Study (FS) Bishkek - Osh in the section Bishkek to Kara Balta. Work on the IEE started in November 2012. This IEE is for the Bishkek to Kara Balta section. In the following background information on Kyrgyz Republic, the Project and the environment within the Project's area of influence is given.
7. The Kyrgyz Republic is a landlocked, mountainous country with formidable geographic barriers that seriously constrain its ability to effectively participate in international trade. Its development efforts are further hampered by inadequate physical infrastructure, which is in need of investment and regular maintenance.
8. Bishkek, the capital of the Kyrgyz Republic, is the country's political and economic hub with a dense population of 840,000. The largest city after Bishkek is Osh (population 250,000), located in the Fergana valley in the south, the country's major agricultural area. These two city's gross domestic product accounts for nearly half of the nation's. Approximately 80% of the country's industry is located in these two cities.
9. The Bishkek-Osh road represents about one fourth of the core international road corridor network in the Kyrgyz Republic, and links the country to Kazakhstan in the north, Uzbekistan and Tajikistan in the south, and the People's Republic of China in the southeast. It crosses four of the seven provinces of the country and serves about 2 million people. It is the only direct surface link between the southern and northern parts of the country making it crucial for maintaining the country's social, political, and economic integrity. The Bishkek-Osh road forms part of the Central Asia Regional Economic Cooperation (CAREC) Corridor 3, which runs from the west and south Siberian region of the Russian Federation through Kazakhstan, Kyrgyz Republic, Tajikistan, Afghanistan, and Uzbekistan to the Middle East and South Asia.
10. The development of the transport sector is very important for landlocked Kyrgyz Republic as it will help ensure a cost-effective access to regional and domestic markets. It will also help generate employment and provide services throughout the country.
11. The proposed project will improve the national and regional connectivity by rehabilitating 52 km of crucial road section between Bishkek and Osh. The proposed project is consistent with the government's priority in upgrading key corridors as stated in its draft Medium-Term Development Program (2012–2014) and is included in ADB's draft Country Operations Business Plan (2012–2014) for the Kyrgyz Republic.
12. The Government of the Kyrgyz Republic has requested the Asian Development Bank (ADB) to identify, formulate, and prepare an ensuing loan and/or grant for the CAREC Corridor (Bishkek-Osh) Improvement Project, Phase 4. A feasibility study suitable for ADB financing is required for the loan and/or grant. This Initial Environmental Examination (IEE) has been prepared as part of the feasibility study. The study covers the road section Bishkek to Kara Balta (60km).

13. The benefit of the proposed project will be improved connectivity and access to markets. The outcome of the project will be efficient movement of freight and passenger traffic along the Bishkek-Osh road. The project outputs will be: (i) 60 km of rehabilitated road from Bishkek to Kara Balta, (ii) strengthened road asset management system, and (iii) improved road safety.
14. Environmental impacts of the Bishkek – Osh road rehabilitation are minimal since most of the construction activities will take place along the existing RoW. The impacts will include among others (i) noise impacts, emission of pollutants to air and vibration, which is especially of high significance within the settlements alongside the Project road and where sensitive receptors are located such as schools, hospitals mosques or other, (ii) impacts on water courses and rivers (iii) impacts from aggregate sourcing at borrow sites; (iv) impacts on soil and vegetation, inclusive tree plantations alongside the Project road due to site clearance activities; (v) impacts from bridge rehabilitation; (vi) impacts from asphalt plant and aggregate crushers and (vii) impacts from contractor's working camps. Impacts have been divided in to design phase, construction phase, and operation phase impacts. Impacts are described in the chapter "Environmental Impacts and Mitigation Measures" and in the EMP.
15. The Bishkek – Kara Balta road section is located between km 9 and km 61 of the Bishkek – Osh Road. The section starts at the end of the administrative border of Bishkek City at road km 9. At the beginning the road has a 6-lane configuration which turns to a 4-lane configuration of the carriageway until km 21. The existing pavement is asphalt concrete and the paved width is between 15 and 20 m. Shoulder width ranges from 1.5 to 3.0 m. The Section proceeds westward to the outskirts of Kara Balta town, passing through a number of settlements interspersed by agricultural fields first with a 3-lane configuration of carriageway, than changing to 2-lanes. The paved width is 8 to 12 m and the shoulder width is 1.5 to 3.0 m. The villages along the road are merging into a relatively continuous ribbon along the roadway. At km 61 the Bishkek-Osh Road turns south at a roundabout, which marks the end of the road section. The terrain for entire sections can be classified as flat with altitudes ranging from 750 m to 800m.
16. Land use within the area of influence of the Bishkek - Kara Balta road section is mainly agricultural. Cultivated crops in the Bishkek to Kara Balta section are mainly wheat, feed and technical crops, different kinds of vegetables like potatoes, peppers, carrots, water melons and egg plants and fruit plantations like apple trees and apricots.



**Fig. 1: The Bishkek – Kara Balta road section**

17. Field surveys for the environmental investigations started in November. Over the winter time work focused on desktop study concerning the legal framework, project description and environmental baseline data. Available literature was studied and project data, statistical data, maps and aerial photographs compiled. Extensive site surveys on the physical and biological environment were conducted in spring, March and April. Based on results of conducted field survey environmental impacts were identified and suitable mitigation measures prepared. Because the Project involves the rehabilitation of an existing road and also because there are no protected areas located within the Project's area of influence occurring environmental impacts are mostly confined to the construction stage. Therefore the Project was categorized as B by ADB.
18. Sensitive receptors were identified alongside the Project road and baseline measurements were conducted. Public consultation meetings were conducted in Voенно\_Antonovka village, Sokuluk city, Belovodskoye village and Poltavka village. Minutes were taken and are attached to the report.

## **B. Environmental Clearance Requirements**

19. According to ADB's *Guidelines and Environmental Assessment Requirements of Infrastructure Projects*, an IEE will be presented to both the Government of Kyrgyz Republic and ADB. According to initial environmental assessment the project road has been qualified as category "B".

### **1. Government Environmental Laws, Regulations and Guidelines**

20. Environmental impact of the Bishkek – Osh Rehabilitation Project is regulated by a number of environmental legislative acts of the Kyrgyz Republic. The Bishkek – Osh Rehabilitation Project provides the usage of old pavement in the existing right-of-way. As to extraction of materials - the Project plans to use the borrow pits that have already

been in operation for a long time and, therefore, no crucially new environmental impacts are expected. Besides, it is planned to use for material haulage the arterial roads available for all borrow areas and therefore no new disturbance sources will occur. Therefore, the proposed reconstruction of the Bishkek – Osh road only requires the State Environmental Expertise (SEE) and it is not required to prepare an overall Environmental Impact Assessment (EIA). According to the article 10 of the Kyrgyz Republic State Environmental Expertise Act, the EIA is required for construction of new roads (facilities).

21. The elaborated existing normative legal base is intended for determination of legal basis for implementation of projects and their compliance with state requirements for environmental protection and mitigation of environmental impact.

**Tab. 1 Relevant laws and regulations on the environmental impacts of road projects.**

The KR <b>Environmental Protection Act</b> dated June 16, 1999 № 53 (as amended by the KR Acts dated 4.02.2002 № 22, 11.06.2003 № 101, 11.08.2004 № 113, 6.08.2005 № 124, 27.04.2009 № 131)	Defines the policy and regulates the legal relations applicable to natural management and environmental protection in the Kyrgyz Republic.
Article 17: Environmental requirements to location, designing, construction, reconstruction and commissioning of enterprises, structures and other facilities	Arrangements for nature protection, rational use and restoration of natural resources, as well as environment enhancement should be provided and fulfilled in accordance with ecological standards and the EIA of planned activities should be made in the course of construction.
Article 22: Environmental Protection from Harmful Physical Effects	It is forbidden to exceed the standard maximum allowable limits of industrial and other noises, vibrations, electromagnetic fields and other harmful physical effects on human health and environment.
The KR <b>State Environmental Expertise Act</b> dated June 16, 1999 № 54 (as amended by the KR Acts dated 11.06.2003 № 102, 26.02.2007 № 21)	Regulates the legal relations applicable to the state environmental expertise.
Article 3: Objects (Facilities) of State Environmental Expertise	Feasibility studies and designs of construction, reconstruction, expansion, technical upgrading, temporary closing and liquidation of objects (facilities).
Article: Environmental Impact Assessment	EIA is arranged and made when preparing the feasibility evaluations for: - new construction, expansion and technical upgrading of operating economic and other facilities that affect or can affect the environment.

## 2. ADB Safeguards

22. As noted previously ADB has classified the Bishkek – Osh road as category “B” for Environmental Assessment. The categorization was carried out based on ADB’s Safeguard Policy Statement (2009), and ADB Methodological Guidelines on Environmental Assessment (2003). Because the Project is environmentally categorized as B, an IEE is required. An initial step in determining a project’s environment category is to prepare a Rapid Environmental Assessment (REA) screening checklist, taking into

account the type, size, and location of the proposed project. A project is classified as one of the following four environmental categories:<sup>1</sup>

- Category A : Projects with potential for significant adverse environmental impacts. An environmental impact assessment and a summary EIA (SEIA) are required to address significant impacts.
- Category B: Projects judged to have some adverse environmental impacts, but of lesser degree and/or significance than those for category A projects. An initial environmental examination and a summary IEE are required to determine whether or not significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
- Category C: Projects unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are still reviewed.
- Category FI: Projects are classified as category FI if they involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all subprojects will result in insignificant impacts.

23. Public consultational meetings on social and environmental issues were carried out within the week from June 10 to June 14 in Voenna Antonovka village, Sokuluk city, Belovodskoje village and Poltacha villlage. Minutes were taken and are attached to this report. The IEE report is submitted to the State Agency of Environmental Protection and Forestry of the Kyrgyz Republic to obtain the SEE (State Ecological Expertise) for the Project.

## 2. Environmental Standards

24. The following standards are applied to the Project.

Air pollution (some more standards are provided in the chapter on air quality):

**Tab. 2 Ambient air quality standards**

	Unit	Maximum permissible concentration	Average daily concentration
Sulfur dioxide, SO <sub>2</sub>	mg/m <sup>3</sup>	0.5	0.05
Nitrogen dioxide, NO <sub>2</sub>	mg/m <sup>3</sup>	0.085	0.04
Carbon monoxide, CO	mg/m <sup>3</sup>	5	3
Total suspended particulate, PM	mg/m <sup>3</sup>	0.15	0.05

## Noise

**Tab. 3 Noise Standards**

<sup>1</sup> ADB. 2003. *Environmental Assessment Guidelines*, Manila.

Unit: dB

Description of activity/category	Leq		Lmax	
	Day	Night	Day	Night
Areas directly adjacent to hospitals and sanatorium	45	35	60	50
Areas immediately adjacent to dwellings, polyclinics, dispensaries, rest homes, holiday hotels, libraries, schools, etc	55	45	70	60
Areas immediately adjacent to hospitals and dormitories	60	50	75	65
Recreational areas in hospitals and sanitariums	35		50	
Rest areas at the territories of micro-districts and building estates, rest houses, sanitariums, schools, homes of aged, etc	45		60	

Water pollution

25. Standards are shown in Tab. 4 for construction which are based on the Kyrgyz Water Law of 1994.

**Tab. 4 Water standard<sup>2</sup>**

	Standard
pH	6-9
Dissolved oxygen, DO, mg/l	>4
Sulfate, S, mg/l	<250
Ammonium nitrogen, NH <sub>4</sub> -N, mg/l	<3.3
Oil and grease, mg/l	<0.05

**II. DESCRIPTION OF THE PROJECT****A. Overview**

26. CAREC 2020 will seek to improve industrial competitiveness through transport connectivity, and development of economic corridors. Developing economic corridors can help diversify the region's industries and make them competitive through technology, logistics, and other business support services. The project road sections are part of CAREC transport corridors. The impact of the proposed project will be improved connectivity and access to markets. The outcome of the project will be efficient movement of freight and passenger traffic along the Bishkek-Osh road.

27. The project outputs will be: (i) 52 km of rehabilitated road from Bishkek to Kara Balta, (ii) strengthened road asset management system, and (iii) improved road safety.

**Tab. 5 Details of road section from Bishkek to Kara Balta (Section 1)**

<sup>2</sup> More than 1,200 items are specified according to Kyrgyz Law.

Road Sections	Roadway Width and Length of Subsections (km)	Bus Stops	Traffic Signs	Length of Inadequate Draining (km)	Length of Sidewalks to be Reconstructed (km)	Intersections / Junctions
Section 1	4-6 lane – 12 2-3 lane – 40	98	107	2	10	205

28. Conditions of the existing road can be described as follows. Road markings are very rare. Traffic signs are insufficient, sometimes located inadequately, and usually poorly maintained. Guardrails on high embankments are only partly installed and in bad condition. Bus stops along the road are generally damaged and have no roofs. Sidewalks have not been repaired since they were constructed and are not paved on some sections.

#### **B. Type and Category of Project**

29. The Bishkek – Osh road project in the section Bishkek to Kara Balta is aimed at rehabilitating around 52 km of the CAREC transport corridor. The project is categorized as Category “B” for Environmental Assessment (there are only few environmentally sensitive areas along the sections and the impacts of the project are expected to be of low significance, highly local, and originating mainly from the construction activities). Therefore an IEE was prepared for the project road.

#### **C. Need for Project**

30. The Bishkek - Osh road is one of the most important transport corridors in Kyrgyzstan. Traffic, especially heavy traffic will further increase. Considering the already described deficiencies of the Project road, especially with regard to traffic safety and by also considering that sections of the road show severe rutting and frequent undulations which are signs of insufficient bearing capacity for the actual traffic load, the rehabilitation Project is urgently needed.

#### **D. Location**

31. The Bishkek – Kara Balta road section is located between km 9 and km 61 of the Bishkek – Osh Road. The section starts at the end of the administrative border of Bishkek City at road km 9. At the beginning the road has a 6-lane configuration which turns to a 4-lane configuration of the carriageway until km 21.



**Fig. 2: The Central Asia Regional Economic Cooperation Corridors**

**E. Size or Magnitude of Operation**

32. The Project involves rehabilitation of 52 km road length of the Bishkek – Osh road. The construction works will be implemented mainly within the RoW of the existing road, thus keeping environmental impacts to a minimum. The Project will involve a number of associated activities such as utilization of borrow areas, operation of asphalt plants and aggregate crusher, establishment of contractor’s worker camps and storage sites, etc.

33. According the terms of reference the pavement for the road will be designed for an initial design life of 10 years with overlay options for 15 and 20 years design life.

**F. Traffic Volume**

34. Traffic growth forecasts have been developed with regard to the existing traffic volumes on the project road, as revealed by the traffic surveys, and anticipated national and regional economic development.

35. The growth rates assumed concerning traffic increase are 7% for passengers and 4% for freight up until the Project completion year and 4% for both, passenger and freight, annual increase thereafter.

36. From the traffic observations during the reconnaissance visit it can be assumed that the first part of the Bishkek to Kara Balta road section will belong to road category I and remaining road section are assumed to be category II.

**Tab. 6 Road classifications in the Kyrgyz Republic**

Road Class	Volume to Capacity Ratio	Level of Service	Design Traffic Volume		Economic and Administrative Value of Road
			Passenger Car Unit (PCU)	Vehicles	
IA	0.25 – 0.40	B: high	More than 18,000	More than 9,000	Motorway of international and national significance
IB	0.25 – 0.40	B: high	More than 14,000	More than 7,000	Main international roads and national significance (not covered by category IA)
II	0.40 – 0.60	C: medium	6,000 – 14,000	3,000 – 7,000	Highways of international and national importance (not covered by category IA and IB)
III	0.40 – 0.60	C: medium	2,000 – 6,000	1,000 – 3,000	Highways of international, national and importance (not covered by category IA, IB and II)
IV	0.60 – 0.80	D: low	200 – 2,000	100 – 1,000	Provincial and local roads (not covered by category IB, II and III)
V	0.70 – 1.00	E: very low	Under 200	Under 100	Local roads with low traffic (not covered by category III and VI)

#### **G. Proposed Schedule for Implementation**

37. The schedule for the construction activities has not been decided at the time of preparation of this report.

#### **H. Detail of the Project**

38. The project aims at rehabilitating 52 km of road between Bishkek and Kara Balta. Aim is to (i) provide safe and comfortable riding conditions to all road users, being motor vehicles, cyclists and pedestrians, optimized for the road's intended function and the level of use, (ii) provide low cost of ownership (i.e. minimum whole of life cost) to the State Road Authorities (Government), and (iii) to comply with the Pavement Standards and other relevant State Road Authorities' Guide-lines and/or Standards.

39. Following a first interpretation of investigation results and assessment of existing road condition the most suitable options for rehabilitation of the road sections will be

discussed. This will be in the first instance based on technical issues. The options include (i) non-structural overlay, (ii) structural overlay, and (iii) reconstruction with/without lane widening.

40. The rehabilitation of the road will be done mainly using the existing RoW, thus keeping environmental impacts to a minimum. Bishkek to Kara Balta road section will belong to road category I.

- On the Bishkek – Kara Balta road the beginning of the road has a 6-lane configuration which turns to a 4-lane configuration of the carriageway until km 21. The existing pavement is asphalt concrete and the paved width is between 15 and 20 m.;
- Shoulder width on Bishkek – Kara Balta road ranges from 1.5 to 3.0 m.
- The road embankment height in plain regions ranges from 0 to 2 m, in some places embankment is higher with a total height up to 4-6 m;
- Longitudinal gradients in wavy terrain are up to 5-7%;
- The carriageway cross fall on straight sections has been taken as 2% and shoulder slope has been taken as 4%.

41. Rehabilitation measures contain the rehabilitation/reconstruction of the road sections in respect of the above described parameters.

42. It is important to note that no additional driving lanes will be constructed within the scope of work of this project and that rehabilitation and reconstruction works are restricted to the RoW of the already existing road. Therefore environmental impacts are kept to a technically possible minimum.

43. It was found during the survey that culverts were missing in many settlements, yet they are specified in the technical certificate of the road provided by the Client. Local irrigation management offices try to claim availability of these culverts, but in fact they are absent.

44. It was found that the Bridge/Culverts are not properly constructed and maintained. Construction time scaffolding material can still be found in concrete surface. The rubber pad/bitumen sheet placed to support the beams and slab are worn out and do not exist in many places. The existing waterway and side slopes of abutment haven't been cleaned from vegetation and debris. Bridges are at the end of their economic life.

45. Many of the 7 bridges on Bishkek – Kara Balta section are in poor shape and need either partial or total reconstruction. The bridge works will have potential environmental impacts that need mitigation but the impacts of culvert works can be neglected as minimal.

## **I. General Environmental Profile of the Project Road**

46. In term of physical and biological environment there are only few environmentally significant structures along the project road section Bishkek to Kara Balta. Significant structures are the tree rows that are stretching over most parts of the road sections, and the rivers crossed by the Project road, the Sokuluk (28,3 km) and the Ak-Suu (44,65 km) rivers. In addition several smaller watercourses without names are crossed.

47. Tree rows are located along the Bishkek – Kara Balta road section. Examples of species are elm (*Ulmus spec.*) and poplar (*Populus spec.*).
48. The borrow areas proposed for use in the project area are located near to the road. In many cases the access roads to the borrow areas are unpaved and go through residential areas.

### **III. DESCRIPTION OF THE ENVIRONMENT**

#### **A. Physical Resources in Project Area**

##### **1. Topography**

49. The topography of Kyrgyz Republic is very diverse. Its absolute height ranges from 400 to 7000 m. It includes several mountain ranges drawn mainly in east-west and near east-west directions and several dividing intermountain valleys and areas. The average height of the area is 2750 m above sea level, the highest point is Pobeda Peak (7439 m) situated in the Central Tenir Too, at the edge of the Boz-Kyr ridge in the eastern extension of Kakshaal Too, by the boundary of China. The lowest point (401 m) is in the Leylek region of Batken area, in the vicinity of Tajik boundary.
50. Road section from Bishkek to Kara-Balta is located within the relatively flat Chuy Valley and traverses an area parallel to the Kyrgyz Mountain range. Most of the Section is at elevations ranging from approximately 750 to 800 meters above mean sea level.

##### **2. Soil and Geological Characteristics**

51. The territory of Kyrgyz Republic is mountainous and occupies the western part of the Tien Shan range and a small part of the North Pamir.
52. The road section from Bishkek to Kara-Balta is located in the Chuy valley. It is predominantly flat and not subject to land or rockslides. It is within the 9-point Seismic Risk Zone. The section falls within a zone of landslide dispersion and accumulation with virtually no landslide risk.
53. Humid air masses come to the northern part of the country from the north-east and the north. Precipitation there is relatively heavy and soils form amid continental sub-boreal climate.
54. Soil erosion is a major environmental concern throughout the Kyrgyz Republic due to seismic activity, steep slopes, the fragility of the soils and human activities such as inappropriate livestock management, the removal of protective vegetative cover and poor water management practices.
55. Soils of the road section from Bishkek to Kara-Balta are classified as northern gray common soils with low carbonate content. High salinity is one of its major characteristics. Soils in the section are highly productive and much of the area is in productive agricultural use. The erosion potential of the soils in this section is classified as low.

##### **3. Climate**

56. Kyrgyz Republic's location in the middle of Eurasia, its remoteness from oceans and seas and vicinity to deserts predefine formation of climate with the features of extreme continental climate, aridness and clearly defined seasons.

57. Great diversity of the country's terrain - deep roughness, various directions of mountain slopes against the sun and air flows – determines a clear vertical climatic zonation. 4 climatic zones can be observed in the Kyrgyz Republic.
58. Project areas are located in the valley-foothills belt. The valley-foothill belt (from 500—600 m to 900—1200 m) is exemplified by hot summer (up to 28°C), moderately cold and snowless winter with acute precipitation deficit. This belt has the features of subtropical climate.
59. In the project areas the average July temperature is 20—25°C, the average January temperature is -4—7°C. The maximum summer temperature is 44°C.
60. Precipitation in the project area is heavy with amounts up to 1000 mm at mid-mountain terrain of south-western slopes of the Fergana ridge, in Talas and Chuy valleys precipitation is lighter, from 250 to 500 mm.
61. Snowpack in the valley-foothills belt of south Kyrgyz Republic melts away several times in winter and reappears in case of new frosts. Snowpack is stable and rather thick at the heights of more than 1500 m. Snowpack becomes stable in late November and its thickness gets higher gradually and reaches its maximum by late January to early February. Stable snowpack melts away in March-April. Melting of stable snowpack in Chuy and Fergana valleys usually starts on the 3rd week of February.

#### **4. Water Resources**

62. Baseline data on water quality in the areas of sensitive receptors were sampled and analyzed as indicated in the chapter "alignment sheets". Measurement results are shown in the "baseline measurements".
63. Formation of flow and hydrographic network in Kyrgyz Republic is heavily influenced by topography, terrain, climatic conditions and availability of glaciers. Mountain ridges of Kyrgyz Republic are both, barriers for the west, north-west and north humid air masses and natural atmospheric moisture batteries.
64. Most part of the river networks belongs to the Aral basin, to systems of major Central Asian rivers — the Syr-Darya and the Amu-Darya. Whilst basins of the rivers Chu and Talas belong to the Aral basin, they do not bring their streams to main water arteries and form a closed hydrographic system together with the basin of the Issyk-Kul Lake.
65. The Chu river is the largest river (1030 km) in the northern part of Kyrgyz Republic. It dominates the surface hydrology of the road section from Bishkek to Kara-Balta. Large tributaries of the Chu river are, among others, Ak-Suu and Kara-Balta, which are crossed by the project section from Bishkek to Kara-Balta. The section runs also parallel to the Grand Chuy Canal and the RoW in this portion is perpendicular to and crosses several south-north flowing streams. Groundwater supplies are the predominant source of drinking water within the vicinity of the Bishkek-Kara Balta road section.
66. Hydrography of the Bishkek – Kara Balta section is presented by three permanent streams originating in the northern slopes of the Kyrgyz ridge and crossing the project

road. These are the rivers of Dzhelamysh, Sokuluk and Aksu. The road is also crossed by three irrigation channels. When coming out of the mountains, most of the river flow is distributed for irrigation. As a result, for most of the year (the cropping season) there are no river flows in the places where the rivers cross the road.

## 5. Air Quality

67. Baseline data at identified sensitive hotspots and sensitive receptors were measured as indicated in the chapter "alignment sheets" and the chapter "baseline measurements".

68. Air pollution levels in Kyrgyz Republic are a serious concern within the urban areas. The primary sources of air pollution in Kyrgyz Republic's cities, including Bishkek and Kara Balta are thermal power stations, cement plants, chemical industries, urban transport and mining waste. There are many small industrial, municipal and transport enterprises within the municipal area that have both routine and sporadic atmospheric emissions, but no large industrial polluters such as oil refineries or metallurgical plants.

69. Regulatory responsibility and monitoring of air quality in the Kyrgyz Republic rests with the Hydrometeorological Agency. Monitoring points are located in populated areas close to sources of pollution.

**Tab. 7 Ambient air quality standards in Kyrgyz Republic. Source: Ministry of Transport and Communication in Kyrgyz Republic, May 2011.**

Pollutant	Maximum Permissible (mg/m <sup>3</sup> )	Average Daily Concentration (mg/m <sup>3</sup> )
Particulate Material:		
With silica content > 70%	0.15	0.05
70 - 20% (cement, coal, clay, etc.)	0.3	0.1
< 20 % (dolomite, etc.)	0.5	0.15
Cement dust (Calcium oxide > 60% and silica >20%)	0.5	0.05
Sulfur Dioxide SO <sub>2</sub>	0.5	0.05
Carbon monoxide	5	3
Nitrogen Dioxide NO <sub>2</sub>	0.085	0.04
Nitrogen Oxide NO	0.40	0.06
Lead (Pb) and compounds (except tetra ethyl)	-	0.0003
Lead sulphurous (in terms of Pb)	-	0.0017

## 6. Noise

70. Existing ambient noise levels within the road section from Bishkek to Kara-Balta are generally attributable to vehicular traffic, construction and quarrying operations. Residential areas are located in the vicinity of the road. Given the width of the RoW in the area, significant noise impacts to these facilities (if any) should be easily avoidable.

71. Sensitive receptors concerning noise emissions are depicted in the chapter "alignment sheets".

**Tab. 8 Ambient outdoor noise standards in Kyrgyz Republic. Source: Ministry of Transport and Communication in Kyrgyz Republic, May 2011.**

Activity Category	$L_{eq}$	$L_{max}$	Description of Activity Category
8	Day = 45	Day = 60	Areas immediately adjacent to hospitals and sanatoriums
	Night = 35	Night = 50	
9	Day = 55	Day = 70	Areas immediately adjacent to dwellings, polyclinics, dispensaries, rest homes, holiday hotels, libraries, schools, etc
	Night = 45	Night = 60	
10	Day = 60	Day = 75	Areas immediately adjacent to hotels and dormitories
	Night = 50	Night = 65	
11	35	50	Recreational areas in hospitals and sanatoriums
12	45	60	Rest areas at the territories of micro-districts and building estates, rest houses, sanatoriums, schools, homes for the aged, etc

## B. Ecological Resources in Project Area

72. The environment of the project road sections is consisted mostly of anthropogenic landscapes and settlements. There are no specially protected natural areas (SPNAs) in the immediate vicinity of the project area.

## 1. Fauna

73. Diversity of species in Kyrgyz Republic is very high. Over 500 species of vertebrates, including 83 mammals, 368 reptiles and 75 fishes are reported, along with 2,000 species of fungi and over 3,000 insect species. Losses of habitat (deforestation), competition with livestock, hunting and poaching have caused the number of animals to shrink. The most critical situation involves protecting the habitats and populations of the most valuable (both economically and scientifically) species of big mammals such as mountain goats, djeyran, mountain sheep, snow leopard, tien-shan bear, lynx and Menzbir's marmot.
74. Both road sections go mainly through settlements and agricultural fields. Biodiversity there is minimal compared to natural ecosystems and is consisted of stress tolerant (synanthropic) animal species. Mammals along the sections include Norway rat, house and field mouse, and dwarf hamster. The following wild fauna representatives are rare: Turkestan rat (on the Madaniyak – Dzhahal-Abad section), tolai hare, eared hedgehog, forest dormouse, fox, in winter period — wolf.
75. Bird species in the sections are more diversified. Synanthropic species along the project roads include tree and house sparrow, Afghan starling, blackbird, great tit, magpie, blue rock pigeon, dove, and white stork can be met by a nesting place. Wildlife representatives include lark, quail, buntings, representatives of coraciiform, European chat. There are varmints in the fields, such as goshawk, sparrow hawk, common buzzard, long-legged buzzard, rough-legged buzzard, black kite, snake eagle, greater spotted eagle, common kestrel, hobby falcon. The Bazar-Korgon reservoir is the place of residence, seasonal migration and wintering for a great number of water and semi-aquatic birds, such as diving duck, duck, goose, swan, shore birds, takapu, etc.
76. Herpetofauna is represented by lake frog, green toad, Central Asian tortoise, gray gecko, Turkestan agamids, desert lidless skink, diced snake, sand boa, arrow snake, Orsini's viper.
77. The road section from Bishkek to Kara-Balta has been heavily disturbed by urban and agricultural development. The possibility of habitat for threatened or endangered wildlife species is remote.

## 2. Flora

78. Over 4,500 species of higher plants are reported to exist in Kyrgyz Republic. Steppe in the vicinity of the road section from Bishkek to Kara-Balta is covered with grasses and low shrubs such as saxaul and in some areas are covered by vast fields of wild poppies. Chiy, a common grass with whitish, cane-like reeds, is also common and used by the nomads to make decorative screens.
79. As the road section from Bishkek to Kara-Balta has been heavily disturbed by urban and agricultural development, the possibility that any habitat occurs, that is suitable for threatened or endangered plant species is low. Nearly all sidewalks along the Bishkek – Kara-Balta section are planted with windbreak, including small-leaved elm (English elm), Lombardy and white poplars.

### **3. Desertification**

80. The causes of land degradation are multiple, complex, and vary across Kyrgyz Republic's regions, but to a greater extent deterioration and exhaustion of land resources is the result of admittedly incorrect and destructive agricultural practices, overgrazing, deforestation and cutting down of bushes, forest degradation, loss of biodiversity and natural disasters. Over 88% of the existing 10,6 million ha of farmland are recognized as degraded and subject to desert invasion. Lands of secondary salinity have increased and make up 75% of all arable land reserves of the republic; more than half of arable lands in the country are subject to water and wind erosion. About half of pasture lands belong to a category of degraded soils with respect to vegetation and soil quality.

## **C. Human and Economic Resources**

### **1. Population**

81. The Kyrgyz Republic is a sparsely populated country. The population is - 5,365,167 (2010), of which 1,827,4 (approximately one third) live in towns and 3 448,7 (two third) - in rural areas.

82. The road sections of the project are located in two oblasts. The Bishkek – Kara Balta road will begin from Bishkek city and is mostly located in Chui district. The Madaniyak – Jalalabad road section is located in Jalalabad district. Both oblasts consist of 3 rayons and several settlements. Along the project road, there are roughly 135 000 inhabitants in the Chui district.

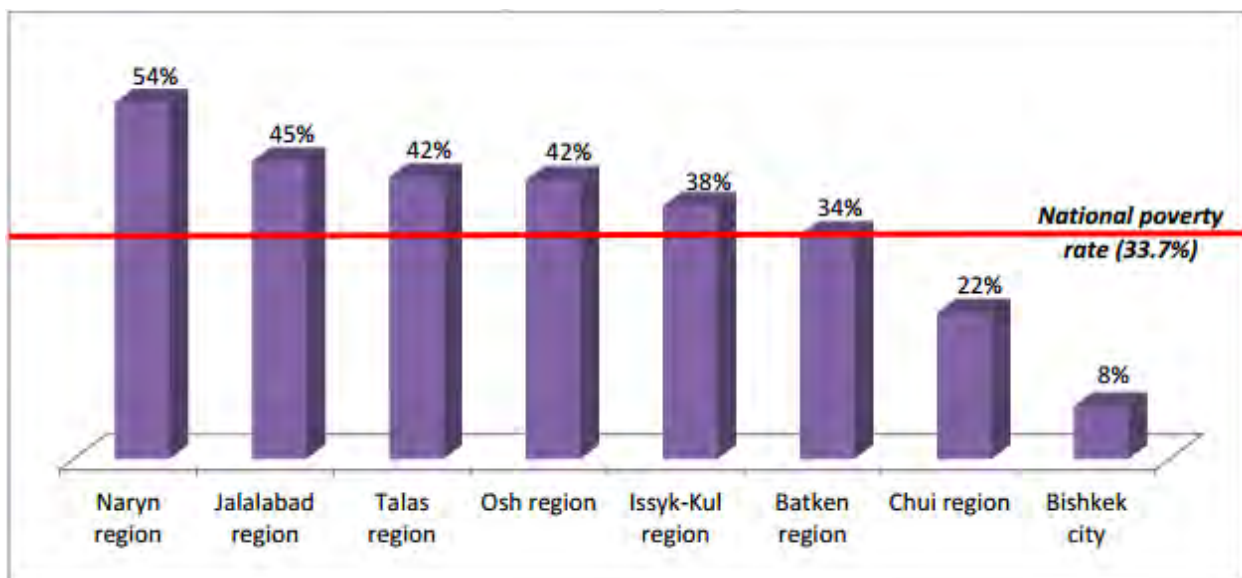
**Tab. 9 Population along the road section Bishkek – Kara Balta**

Oblast	Rayon	km from the beginning of the road	№	Name of the settlement	Number of population (thousand people, as of 01.01. 2011)
	Bishkek city	9	1.	Micro district «Ala-Too»	
Chui	Sokuluk	9.00 – 10.9	2.	<b>Novopavlovka</b> (50HH)	16,546
		10.9 – 14.4	3.	Voenno-Antonovka	10,836
		19.5 – 22.3	4.	Gavrilovka	3,070
			5.	Shopokov	8,717
		22.3 – 23.9	6.	Romanovka	2,934
		23.9 – 29.4	7.	<b>Sokuluk</b> (40 HH)	12,580
		29.4 – 33.4	8.	Aleksandrovka	12,576
	Moskovskii	33.7 – 44.2	9.	Sadovoe	1,722
			10.	<b>Belovodskoe</b> (80 HH)	21,1
	Jayil	44.2 – 52.0	11.	Petrovka	9,140
		52.8 – 57.5	12.	Poltavka	3,881
			13.	Novonikolaevka	7,327
		57.5 – 60.0	14.	Petropavlovka	2,222
		60.0 – 65.0	15.	<b>Kara-Balta</b>	38,470
			16.	Kalininskoe	3739

## 2. Social Infrastructure

83. With a GDP of \$4,616,156,122 (2010), a low labor and social protection (8.2% unemployment rate, 2008), with a poverty level of 33.7 % (2010) and a life expectancy of 69 years (2009) Kyrgyz Republic is one of the poorest and least industrialized countries in the Europe and Central Asia (ECA) region. However, the literacy rate remains high like in other former Soviet states and accounts for 99% of people from ages 15 and above (2009).

84. Official statistics show that the spread of poverty in the country is uneven. In 2010 the value of the poverty line comprised 20973,08 Kyrgyz Som per capita per year, and the value of the extreme poverty line comprised 12608,44 Kyrgyz Som at country level. Figure 6 shows regional disparities in poverty.



**Fig. 3: Regional disparities in poverty level by region in Kyrgyz Republic. Source: Energy and communal services in Kyrgyzstan and Tajikistan: A poverty and social impact assessment.**

85. The 2009 data of the Integrated Household Survey showed that out of the total number of 2420,1 thousand economically active citizens aged 15 and above, 1024,4 thousand were women and 1395,7 thousand were men. 924,2 thousand women and 1292,2 thousand men were employed and 100,2 thousand women and 103,5 thousand men were unemployed. The unemployment rate in 2009 was 8.4% (9,8 % for women and 7,4 % for men). Unemployment is more severe in urban areas (10,9 % and 10,0 % subsequently) than in rural areas (9,1 % and 6,1 %).

### **3. Agriculture and Industry**

86. Agriculture is big employer in Kyrgyz Republic and accounts for around one quarter of the GDP. From 1995 to 2010 the share of agriculture from the GDP of Kyrgyz Republic has declined and the average productivity of a agricultural sector worker has increased. Table 8 shows the evolution of total labour force and the share of agricultural workers from 1997 to 2012. (Source: FAO Country Profiles)

**Tab. 10 Total labour force and the share of agricultural workers in Kyrgyz Republic.**

Kyrgyzstan: Evolution of population and labour force size							
	Size [Millions]				Annual growth rate [%]		
	1997	2002	2007	2012	1997-2002	2002-2007	2007-2012
Total population	4.74	5.00	5.14	5.45	1.07	0.55	1.18
Agricultural population	1.31	1.24	1.15	1.08	-1.09	-1.5	-1.25
Total labour force	1.96	2.14	2.30	2.53	1.77	1.45	1.92
Labour force in agriculture	0.54	0.53	0.51	0.50	-0.37	-0.77	-0.4

Source: FAOSTAT, FAO of the UN

87. The amount of irrigated land in the rayons of Bishkek – Kara Balta section is 147 000 ha, and in the rayons of Madaniyak – Jalalabad section 87 000 ha. (Source: FAO Aquastat)
88. Cultivated crops in the Bishkek to Kara Balta section are mainly wheat, different kinds of vegetables like potatoes, peppers, carrots, water melons and egg plants and fruit plantations like apple trees and apricots. In the Madaniyak to Jalalabad section cultivated crops are cotton, rice and maize and plantations of apricots, apples, pistachio- and almond trees.
89. Cities of Bishkek and Osh account for nearly half of the total GDP for the nation, and are home to 80% of the country's industry.
90. The industrial sector employed 17,6 % of the population in 2005 and 20,6 % in 2010.

## 5. Transport and Traffic accidents

91. Well-functioning transport sector is crucial to Kyrgyz Republic because of the mountainous terrain of the land locked country. It is important from many different aspects, including economic, social, and political.
92. The development of the transport sector is very important for landlocked Kyrgyz Republic as it will help ensure a cost-effective access to regional and domestic markets. It will also help generate employment and provide services throughout the country.
93. This review process clarified that there are massive improvements required regarding the road safety situation and high casualty numbers in Kyrgyz Republic. However, there are a number of initiatives that have already been undertaken in the country, including the training of local road design and traffic engineers in Accident Blackspot analysis and Road Safety Audit procedures, based on international best practice. The Traffic Police have also received training from international donors regarding enforcement procedures and use of specific equipment. A detailed Road Safety Strategy has already been produced and is currently being discussed by politicians at a high level.
94. There is a need for some practical guidance for teachers on how to pass on the road safety message to children. There is no current national guidance on the provision of

road safety education and many teachers use their own methods and resources to get the message across.

95. Road traffic collision data for the project road sections was received from the Ministry of the Interior. Preliminary analysis has been carried out and has indicated the points on the route with the highest rate of crashes.



## 7. Cultural and Historical Sites


96. No historically or culturally significant sites have been identified along the road sections.



## IV. ALIGNMENT SHEETS

The following alignment sheet provides an overview of environmentally sensitive hotspots and receptors alongside the Project road in the section Bishkek to Kara Balta with reference to the Project chainage. The alignment sheets serve as a base for the following impact analysis.

No.	Location	KM	Issue / Picture	Baseline Parameters
<b>Section Bishkek to Kara balta</b>				
1	Village of Novopavlovka	9 to 10.9	Settlement alongside the road, sensitive hotspot with school buildings close to road (see picture no 2), administration building, shops, and church 	Dust, Noise, Vibration, SO <sub>2</sub> , NO <sub>x</sub> , CO  Baseline measurements with moveable instruments along the Project road.
2	Novopavlovka	11-12	Market Nurlan right on the road edge.	Dust, Noise,

No.	Location	KM	Issue / Picture	Baseline Parameters
				Vibration, SO2 NOx CO
3	Voenno Antonovka village	13.1	Sensitive receptor. Secondary school of Voenno-Antonovka village	Dust, Noise, vibration SO2 NOx CO
4	Voenno Antonovka village	14.2	Sensitive receptor. Mosque	Dust, Noise, Vibration, SO2 NOx CO
5	Along the Project road	17	<p data-bbox="578 1115 1214 1266">Below picture show tree plantation of Elms at km 17, right hand side of road. Nearly alongside the whole Project road tree plantations are stretching on both sides. Trees need to be newly planted for compensation.</p> 	Quantity of felled trees, appr. 10.000

No.	Location	KM	Issue / Picture	Baseline Parameters
6	Gavrilovka	21.7 to 23	Village of Gavrilovka and Shopokov town. Sensitive hotspot with residential houses, shops, mosque, kindergarden, schools and shops alongside the Project road.	Dust, Noise, Vibration, SO <sub>2</sub> , NO <sub>x</sub> , CO  Baseline measurements with moveable instruments along the Project road.
7	Sokuluk town	25 to 30	Sensitive hotspot with administration buildings, schools, church, mosque, residential houses, shops and market adjacent to the Project road.  	Dust, Noise, Vibration, SO <sub>2</sub> , NO <sub>x</sub> , CO  Baseline measurements with moveable instruments along the Project road.
10	Aleksandrovka	31.3 to 33.4	Sensitive receptors: secondary school no. 1 and 2 and mosque, wholesale market,	Dust, Noise, Vibration, SO <sub>2</sub> , NO <sub>x</sub> , CO
11	River Crossings	28.3, 43 and 44.65	Crossings of River Sokuluk, temporary creek and River Ak-Suu by Project road. Below picture shows relict of floodplain vegetation, e.g. willow ( <i>Salix alba</i> ) alongside the temporary creek at chainage km 43.	pH dissolved oxygen oil products

No.	Location	KM	Issue / Picture	Baseline Parameters
				turbidity total suspended solids conductivity temperature lead
12	Belovodskoe	42 to 45	<p>Sensitive hotspot. Belodovske town with residential houses, shops, Church and Mosque, market. Commercial area with supermarket. Buisnesses are on both sides of the road.Design solution mitigates physical impact as far as technically feasible.</p> 	Dust, Noise, Vibration, SO2, NOx, CO
15	Petrovka, Novonikolaevka	50.6 to 60	<p>Sensitive receptors. Three secondary schools at chainage 50.6, 55 and 57, houses behind the treelines which will be cleared, monument, mosque. At km 59 Sensitive receptor secondary school of Novonikolaevka.</p>	Dust, Noise, Vibration, SO2, NOx, CO

No.	Location	KM	Issue / Picture	Baseline Parameters
17	Jayil Rayon	48 to 60	<p>Tree plantations in between project road and residential houses reduce emission to residential. Planting of new trees as compensation measures.</p> 	Quantity of felled trees, appr. 10.000

## V. BASELINE MEASUREMENTS

97. Baseline measurements were conducted as indicated in the above alignment sheets.

### A. Air Measurements

Air measurements were taken at the following locations:

1. Novopavlovka village (school)
2. Novopavlovka village (market)
3. Voенno-Antonovka village (school)
4. Voенno-Antonovka village (mosque)
5. Gavrilovka village (school)
6. Sokuluk village (market)
7. Sokuluk village (school)
8. Alexandrovka village
9. Belovodskoe village (market)
10. Belovodskoe village (mosque)
11. Poltavka village (school)
12. Petropavlovka village (school)
13. Novonikolaevka village (school)

98. The air measurements were taken on July 06, from 13:00 – 16:10 pm. Weather conditions were fair.

99. The sampling method was according to legal Kyrgyz requirements, as defined in the RD 52.04.186-89 “Air pollution control manual”, GOST R 50820-95. Gas-cleaning and dust-

collecting equipment. Methods for determining dust level of gas-dust flow. Operations Manual for ЯВША 413311.012 РЭ, ИБЯЛ 416143004 РЭ, ИБЯЛ 413411042 РЭ.

Method of analyzing was according to the following:

1. Portable gas analyzer PGA-200, Operations Manual for ЯВША 413311.012 РЭ.
2. Air pollution control manual for РД 52.04 186-69
3. Measuring instrument ИКВЧ-В3, Operations manual for ИБЯЛ 416143004 РЭ

The measurement results for air quality are depicted in the following table.

The measurement results show that for sulfur dioxide the Kyrgyz legal standard is exceeded at all measurement locations.. For carbon oxide the standards are exceeded at most locations. Nitrogene oxide and suspended solids show no exceedence. The measurement results will serve as refence values for the monitoring during construction stage.

Results are depicted in the following table. The number in the headline of tables indicate the locations as follows:

**Locations of sampling:**

- |  |                                      |
|--|--------------------------------------|
| 203- Novopavlovka village (school)     | 210- Alexandrovka village            |
| 204- Novopavlovka village (market)     | 211- Belovodskoe village (market)    |
| 205- Voенno-Antonovka village (school) | 212- Belovodskoe village (mosque)    |
| 206- Voенno-Antonovka village (mosque) | 213- Poltavka village (school)       |
| 207- Gavrilovka village (school)       | 214- Petropavlovka village (school)  |
| 208- Sokuluk village (market)          | 215- Novonikolaevka village (school) |
| 209- Sokuluk village (school)          |                                      |

Tab. 11 Air Quality Measurement Results

Name of ingredients	Unit of measurement	Analysis data by locations														The highest non-recurrent MPC
		Bishkek-Kara-Balta														
		203	Exceeding the highest non-recurrent MPC	204	Exceeding the highest non-recurrent MPC	205	Exceeding the highest non-recurrent MPC	206	Exceeding the highest non-recurrent MPC	207	Exceeding the highest non-recurrent MPC	208	Exceeding the highest non-recurrent MPC	209	Exceeding the highest non-recurrent MPC	
Sulfur dioxide	mg/m <sup>3</sup>	3,2±0,8	6,4 <sup>9a</sup>	2,3±0,6	4,6 <sup>9a</sup>	1,2±0,3	2,4 <sup>9a</sup>	1,2±0,3	2,4 <sup>9a</sup>	1,5±0,4	3,0 <sup>9a</sup>	1,1±0,3	2,2 <sup>9a</sup>	1,1±0,3	2,2 <sup>9a</sup>	0,5
Nitrogen oxide	mg/m <sup>3</sup>	<0,01	- <sup>9a</sup>	<0,01	- <sup>9a</sup>	<0,01	- <sup>9a</sup>	<0,01	- <sup>9a</sup>	<0,01	- <sup>9a</sup>	<0,01	- <sup>9a</sup>	<0,01	- <sup>9a</sup>	0,085 <sup>9a</sup>
Carbon oxide	mg/m <sup>3</sup>	6,5±1,6	1,3 <sup>9a</sup>	3,8±0,95	- <sup>9a</sup>	4,9±1,2	- <sup>9a</sup>	6,2±1,6	1,2 <sup>9a</sup>	6,4±1,6	1,3 <sup>9a</sup>	10,4±2,6	2,1 <sup>9a</sup>	5,5±1,4	1,1 <sup>9a</sup>	5,0
Suspended solid	mg/m <sup>3</sup>	<0,1	- <sup>9a</sup>	<0,1	- <sup>9a</sup>	<0,1	- <sup>9a</sup>	<0,1	- <sup>9a</sup>	<0,1	- <sup>9a</sup>	<0,1	- <sup>9a</sup>	<0,1	- <sup>9a</sup>	0,5
		210	Exceeding the highest non-recurrent MPC	211	Exceeding the highest non-recurrent MPC	212	Exceeding the highest non-recurrent MPC	213	Exceeding the highest non-recurrent MPC	214	Exceeding the highest non-recurrent MPC	215	Exceeding the highest non-recurrent MPC	- <sup>9a</sup>	- <sup>9a</sup>	- <sup>9a</sup>
Sulfur dioxide	mg/m <sup>3</sup>	1,6±0,4	3,2 <sup>9a</sup>	1,1±0,3	2,2 <sup>9a</sup>	0,8±0,2	1,6 <sup>9a</sup>	0,6±0,2	1,2 <sup>9a</sup>	0,8±0,2	1,6 <sup>9a</sup>	1,2±0,3	2,4 <sup>9a</sup>	- <sup>9a</sup>	- <sup>9a</sup>	0,5
Nitrogen oxide	mg/m <sup>3</sup>	<0,01	- <sup>9a</sup>	<0,01	- <sup>9a</sup>	<0,01	- <sup>9a</sup>	<0,01	- <sup>9a</sup>	<0,01	- <sup>9a</sup>	<0,01	- <sup>9a</sup>	- <sup>9a</sup>	- <sup>9a</sup>	0,085 <sup>9a</sup>
Carbon oxide	mg/m <sup>3</sup>	5,6±1,4	1,1 <sup>9a</sup>	9,9±2,5	2,0 <sup>9a</sup>	2,5±0,6	- <sup>9a</sup>	2,6±0,7	- <sup>9a</sup>	2,3±0,6	- <sup>9a</sup>	7,3±1,8	1,5 <sup>9a</sup>	- <sup>9a</sup>	- <sup>9a</sup>	5,0
Suspended solid	mg/m <sup>3</sup>	<0,1	- <sup>9a</sup>	<0,1	- <sup>9a</sup>	<0,1	- <sup>9a</sup>	<0,1	- <sup>9a</sup>	<0,1	- <sup>9a</sup>	<0,1	- <sup>9a</sup>	- <sup>9a</sup>	- <sup>9a</sup>	0,5

## B. Water Quality Measurements

Water quality measurement results have been obtained from the laboratory for the River at Belovodskoye village. Method of sampling was according to GOST R 51592-2000 "Water. General sampling requirements". NBN 33-5.3.01-85 Instruction on sampling for waste water analysis. legal standards are not exceeded. Measurement results are shown in the following table. The measurement results will serve as reference values for the monitoring during construction stage.

**Tab. 12 Water Quality Measurement results at location 155 – river in Belovodskoye village. Date of sampling July 05, 2013.**

Name of ingredients	Unit of measurement	Analysis data by locations 155	MPC* (**)	Normative documents
pH		7,71		Economical Relations Council, part 1, M. 1977
Clarity	cm	0,0		Economical Relations Council, part 1, M. 1977
Conductivity		383		Economical Relations Council, part 1, M. 1977
Suspended solids	mg/l	2346		Economical Relations Council, part 1, M. 1977
Petrochemicals	mg/l			PND F 14.1:2:4.128-98
Copper	mg/l	<0,0006		Methodical Instructions 08-47/091
Zinc	mg/l	<0,0005		Methodical Instructions 08
Cadmium	mg/l	<0,0002		Methodical Instructions 08
Lead	mg/l	<0,0002		Methodical Instructions 08

## C. Noise Measurements

Measuring devices and state calibration details:

Measuring device	No.	Calibration certificate		Valid until
		No.	Date	
Oktava 101A	04A445	394/r	20.12.2012	20.12.2013

Regulatory documents followed during the measurements:

SN (Sanitary Norms) 2.2.4/2.1.8.562-96 "Noise at workplaces, in dwelling rooms, in public buildings and at the area of residential development".

The noise measurement results are shown in the following table:

**Tab. 13 Noise Measurement Results**

No.	Location	Nature of Noise						Octave-band pressure level (dB) with mean-metric frequencies (hz)									Sound level (dBA)	
		By spectrum		By temporary				31.5	63	125	250	500	1000	2000	4000	8000		
		Wideband	Tonal	Constant	Fluctuating	Intermittent	Impulsive											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	20	
<b>Bishkek – Kara-Balta</b>																		
9	Novonikolaevka (school), km 59	+				+		62	60	57	56	58	57	54	52	39	62	Actual
								90	75	66	59	54	50	47	45	44	55	MPL
								-	-	-	-	<b>4</b>	<b>7</b>	<b>7</b>	<b>7</b>	-	<b>7</b>	<b>Exceed.</b>
10	Petropavlovka (school), km 57	+				+		62	68	60	58	56	53	55	48	40	58	Actual
								90	75	66	59	54	50	47	45	44	55	MPL
								-	-	-	-	<b>2</b>	<b>3</b>	<b>8</b>	<b>3</b>	-	<b>3</b>	<b>Exceed.</b>
11	Petropavlovka (school), km 55	+				+		61	69	68	65	56	57	50	44	40	62	Actual
								90	75	66	59	54	50	47	45	44	55	MPL
								-	-	<b>2</b>	<b>6</b>	<b>2</b>	<b>7</b>	<b>3</b>	-	-	<b>7</b>	<b>Exceed.</b>
12	Belovodskoe (Mosque)	+				+		65	59	57	52	61	56	53	49	42	63	Actual
								90	75	66	59	54	50	47	45	44	55	MPL
								-	-	-	-	<b>7</b>	<b>6</b>	<b>6</b>	<b>4</b>	-	<b>8</b>	<b>Exceed.</b>
13	Belovodskoe (market)	+				+		64	61	62	64	58	66	60	52	45	72	Actual
								90	75	66	59	54	50	47	45	44	55	MPL
								-	-	-	<b>5</b>	<b>4</b>	<b>6</b>	<b>13</b>	<b>7</b>	<b>1</b>	<b>7</b>	<b>Exceed.</b>
14	Aleksandrovka (school)	+				+		72	69	71	63	58	64	49	63	52	72	Actual
								90	75	66	59	54	50	47	45	44	55	MPL
								-	-	<b>5</b>	<b>4</b>	<b>4</b>	<b>14</b>	<b>2</b>	<b>18</b>	<b>8</b>	<b>17</b>	<b>Exceed.</b>
15	Sokuluk (school)	+				+		65	72	61	64	65	64	59	52	44	72	Actual
								90	75	66	59	54	50	47	45	44	55	MPL
								-	-	-	<b>5</b>	<b>11</b>	<b>14</b>	<b>12</b>	<b>7</b>	-	<b>17</b>	<b>Exceed.</b>
16	Sokuluk (central market)	+				+		75	73	72	67	70	69	62	57	49	72	Actual
								90	75	66	59	54	50	47	45	44	55	MPL
								-	-	<b>6</b>	<b>8</b>	<b>16</b>	<b>19</b>	<b>15</b>	<b>12</b>	<b>5</b>	<b>17</b>	<b>Exceed.</b>
17	Shopokov town (school)	+				+		69	70	67	69	70	59	55	42	41	75	Actual
								90	75	66	59	54	50	47	45	44	55	MPL
								-	-	<b>1</b>	<b>10</b>	<b>16</b>	<b>9</b>	<b>8</b>	-	-	<b>20</b>	<b>Exceed.</b>
18	Voenno-Antonovka (Mosque)	+				+		62	65	63	59	59	57	49	45	38	61	Actual
								90	75	66	59	54	50	47	45	44	55	MPL
								-	-	-	-	<b>5</b>	<b>7</b>	<b>2</b>	-	-	<b>6</b>	<b>Exceed.</b>
	Voenno-	+				+		65	68	72	65	64	60	57	49	40	70	Actual

19	Antonovka (school)							90	75	66	59	54	50	47	45	44	55	MPL
								-	-	<b>6</b>	<b>6</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>4</b>	-	<b>15</b>	<b>Exceed.</b>
		+				+												
20	Novopavlovka (market)							70	75	72	63	65	52	46	40	41	62	Actual
								90	75	66	59	54	50	47	45	44	55	MPL
								-	-	<b>6</b>	<b>4</b>	<b>11</b>	<b>2</b>	-	-	-	<b>7</b>	<b>Exceed.</b>
		+				+		68	69	65	60	58	62	57	50	42	69	Actual
21	Novopavlovka (school)							90	75	66	59	54	50	47	45	44	55	MPL
								-	-	-	<b>1</b>	<b>4</b>	<b>12</b>	<b>10</b>	<b>5</b>	-	<b>14</b>	<b>Exceed.</b>

MPL - maximum permissible level

Exceed. – exceedance

Conclusion: The results of instrumental measurements show that the noise level at the area of residential development exceeds the maximum permissible level from 3-20 dB and does not comply with the requirements of SanPiN (Sanitary Regulations and Standards) 2.1.8.562-96 “Noise at workplaces, in dwelling rooms, in public buildings and at the area of residential development”.

Basis: SN (Sanitary Norms) 2.2.4/2.1.8.562-96 “Noise at workplaces, in dwelling rooms, in public buildings and at the area of residential development”.

#### D. Vibration Measurements

Vibration measurements were carried out by means of the following device.

Measuring device	No.	Calibration certificate		Valid until
		No.	Date	
Oktava 101B	04B361	BA06-05-8170	04.12.2012	04.12.2013

The results are depicted in the following table.

**Tab. 14 Vibration Measurement Results**

No.	Location	Nature of Noise						Octave-band pressure level (dB) with mean-metric frequencies (hz)									Sound level (dBA)	
		By spectrum		By temporary				1,0	2,0	4,0	8,0	16,0	31,5	63				
		Wideband	Tonal	Constant	Fluctuating	Intermittent	Impulsive											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	20	
<b>Bishkek – Kara-Balta</b>																		
9	Novonikolaevka (school), km 59	+				+					86	74	67	68	65	66	85	Actual

10	Petropavlovka (school), km 57	+				+					87	78	69	66	65	66	88	Actual
11	Petropavlovka (school), km 55	+				+					83	80	71	72	67	66	82	Actual
12	Belovodskoe (Mosque)	+				+					80	87	65	66	65	67	93	Actual
13	Belovodskoe (market)	+				+					88	87	78	71	68	66	97	Actual
14	Aleksandrovka (school)	+				+					88	77	70	69	68	65	98	Actual
15	Sokuluk (school)	+				+					76	70	82	87	67	66	91	Actual
16	Sokuluk (central market)	+				+					77	70	68	65	66	65	92	Actual
17	Shopokov town (school)	+				+					72	79	68	74	73	66	81	Actual
18	Voenno- Antonovka (Mosque)	+				+					79	63	71	64	66	68	88	Actual
19	Voenno- Antonovka (school)	+				+					74	73	75	73	71	72	90	Actual
20	Novopavlovka (market)	+				+					70	79	72	73	77	80	80	Actual
21	Novopavlovka (school)	+				+					74	69	68	65	66	67	87	Actual

Conclusion: The results of instrumental measurements show that the vibration level is not stable; vibration is not controlled for the adjacent residential area by vibration speed.

## **VI. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

100. Based on the results of the conducted field surveys environmental impacts were identified and described and suitable mitigation measures prepared. Because the Project involves the rehabilitation of an existing road and since there are no protected areas located within the Project's area of influence, the occurring environmental impacts are mostly confined to the construction stage. As it was already described in the Aide Memoire of ADB Mission in May 2012 the most severe impacts result from civil work activities during construction stage. Most severe impacts refer to the human environment, particularly concerning noise emissions, emissions of pollutants and vibrations within the traversed settlements especially when the Project road runs close to sensitive receptors such as schools, hospitals, mosques, bazars or other. In summary main impact categories arise from the following activities: (i) construction works within or close to settlements result in noise impacts, emission of pollutants to air and vibration which is especially of concern when the Project road comes close to sensitive receptors, (ii) site clearance activities result in loss of top soil and vegetation structures, (ii) aggregate sourcing, crushing of aggregates and asphalt plant operation may have severe impacts in case of unsuitable site selection or management. Additional impacts refer to (iii) impacts from bridge rehabilitation, (v) potential impacts on surface waters and potential impacts on natural habitats and biodiversity. In the following chapters the impacts are described. They have been divided in to design phase, construction phase, and operation phase impacts.

### **A. DESIGN PHASE**

#### **1. Ecological environment**

101. The main ecological impacts at the design phase of the project are directed to the loss of tree lines along the road sections and potentially cattle crossing the road.
102. Plant communities are generally degraded and replaced by anthropogenic formations: man-made planting (gardens and forest belts along the road) and agricultural fields.
103. Impacts on the ecological environment are minimal due to the fact, that the project activities will be mainly located on the existing RoW. The activities for road rehabilitation will not cause the loss of valuable habitat or biodiversity hot spots, nor will it cause new fragmentation of currently undisturbed natural habitats.
104. Further impacts from the road may include cattle crossing the road. Depending on the situation, mitigation measures will be specified as appropriate. Possible mitigation measures would be the provision of warning signs in accordance with relevant road safety standards. In addition, reflectors may be provided on trees in the critical sections and the road fenced near pastures.
105. There are lines of trees located on either one side or both sides of the road along the whole length of Bishkek – Kara Balta road section. Figure below presents tree lines by the Bishkek – Kara Balta road.

106. The Project involves a significant amount of road side tree losses. On the Bishkek to Kara Balta section 11.000 trees need to be cut.

107. Additional potential impacts on the trees may include compaction of soil by the roots of the tree, alteration of ground levels beside the tree (more than 30 cm), covering the soil around the tree with impervious material, release of materials that are toxic to the trees, or physical severance of the root system. Mitigation of impacts to trees can be done through refraining from storing construction material and other heavy equipment which could compact the soil near the roots, using only organic material at the tree stem zone for potential fill up, or fencing the area around the trees during construction works near the trees.

Tree losses that are unavoidable are compensated by new plantations. Planting shall be conducted after technical works have been completed and the time for it shall be restricted to spring (March till April) and/or autumn (September till October). The trees shall be planted at the spots where the tree losses have occurred and they will be planted with the following parameters: 1,5 – 2 m height, age 5 – 6 years; Distance in between individual trees shall be 6 – 8 m; and the planted species will be *Juglans regia*, *Acer negundo*, *Ulmus carpinifolia*, *Populus alba*, *Salix alba*, *Robinia pseudoacacia*.



**Fig. 4: Tree lines by the Bishkek – Kara Balta road section.**

## **2. Bridge/Culvert Rehabilitation**

108. Many of the 7 bridges on Bishkek – Kara Balta section are in poor shape and need either partial or total reconstruction. The bridge works will have potential environmental impacts that need mitigation but the impacts of culvert works can be neglected as minimal.
109. The culverts require either cleaning, repairing or reconstruction. The new or repaired culverts will have to have sufficient diameter to prevent blocking.
110. The environmental impacts concerning culvert reconstruction and rehabilitation can be neglected, it is minimal. Culvert replacement will contribute to sustainable functioning of the irrigation systems alongside the project road sections. Without replacement of the culverts the local irrigation system might be damaged.
111. Regarding the bridge rehabilitation, clear distinction needs to be made between impacts of bridges that are subject to only rehabilitation and bridges that require partial or total reconstruction. For example: (i) bridges needing only rehabilitation and are in fair condition; (ii) bridges needing widening or partial reconstruction but which have enough loadbearing capacity are in satisfactory to poor condition; and (iii) bridges which need reconstruction for lack of loadbearing capacity are in poor condition. Bridges for rehabilitation may require corrosion treatment for rusted reinforcement structures, which can cause severe water pollution.
112. The bridges along Bishkek – Kara Balta road section are located at km11 (Partial reconstruction), km17 (Rehabilitation), km23 (Total reconstruction), km27 (Total reconstruction), km40 (Partial reconstruction), km43 (Partial reconstruction), and km44 (Partial reconstruction).
113. Recommended timing for total and partial reconstruction works is outside the period of maximum flow rates of the rivers they are crossing. This means that in Bishkek – Kara Balta section the reconstruction shouldn't be carried from June to August.
114. The lower parts of the bridge embankment have to be protected against erosion. This will be done using protection plates to prevent the erosion process. Detailed design of the respective protection measure is presented in the technical design documentation for the respective bridges. An example of bridge slope protection is presented in figure 9.



**Fig. 5: An example of bridge slope protection for Kara-Unkur river bridge.**

115. Chemicals used for possible bridge corrosion treatment are especially hazardous for water ways and the treatment requires special provisions for preventing chemicals reaching the water. When carrying out corrosion treatment the stream under the bridge must be covered with culvert pipes and the pipes covered with sand. The sand will absorb spilling chemicals and has to be collected and disposed of in an environmentally friendly manner.
116. The bridge reconstruction debris has to be removed in an environmentally safe manner and the costs of environmental measures have to be included in the unit costs of the contractor.
117. The contractor shall submit a method statement or plan for the execution of bridge construction works including measures that will be undertaken to address adverse environmental impacts such as erosion of river embankment and siltation of watercourses that may result from such activities. The plan shall be submitted to the Safeguard Department of the IPIG in the MoTC.

## **B. CONSTRUCTION PHASE**

### **1. Borrow areas**

118. The impacts related to establishment of borrow pits are largely dependent on the need for opening new pits. All of the proposed borrow areas are already in operation and therefore environmental impacts concerning potential disfigurement of landscape, vegetation losses and damage to access roads are kept to a minimum.
119. The proposed borrow areas are located near or in reasonable distance to the road sections. The investigations and previous test results indicate that the naturally

occurring granular material in the project area is in most cases suitable for fill, capping and sub-base construction but requires in most cases some processing (screening). The impacts from utilizing borrow areas include siltation or obstruction of water ways and dust emissions from hauling of materials.

120. The contractor will refrain from storing material near surface waters to prevent siltation or obstruction of water ways.

121. The contractor will wet the unpaved routes which go next to settlements to suppress dust pollution when hauling material from borrow pits and provide covers for the load of all hauling vehicles to prevent dust pollution. Also wetting the aggregate load reduces potential dust emissions. The contractor will submit an SSEMP which addresses also site specific dust reduction measures, including transportation and post-closure rehabilitation of borrow sites. Figure 10 and 11 show the borrow areas located along the road sections.



**Fig. 6: Borrow areas along the road section Bishkek – Kara Balta**

122. The following borrow areas are proposed as material sources for the Bishkek – Kara Balta section:

- Dzhelamysh borrow area is located in a valley of the river Dzhelamysh located in the southern edge of the Chui depression. The nearest settlement, Kara-Sakal village, is immediately adjacent to the deposit from the north. Available material in the deposit is gravel and sand, the licensed area is 5,75 ha.

- Sokuluk borrow area is located in the river bed of Sokuluk river, 5 km southward of Sokuluk urban village. Available material is gravel and sand with boulders. The explored area of the site is 21,000 m<sup>2</sup> and the depth of explored productive stratum is about 6 m.
- Aksu material deposit is located about 4.0 km to the south-west of the village Belovodskoe and confined to the former floodplain and first terrace above the floodplain of the Aksu River. To use the sand in mixture for asphalt or cement concrete the sand has to be washed.
- Kara Balta material deposit is near to the Bishkek-Dzhambul road. The deposit is confined by the irrigation channel from the east and by agriculture land from the west. Morphologically, the sand-and-gravel deposits of the Kara-Balta borrow area are confined to the bottom of the Chon-Kaindy river and to its first, second and third terraces above the flood-plain. The content of clay particles ranges from 3.4% to 15.2%, therefore, sands of the Kara-Balta deposit should be washed.

123. Dzhelamysh borrow area is located roughly 2 km south from the crossroad at km 20. Access road to the borrow area is a paved road which goes through a small residential area. Impacts of utilizing Dzhelamysh borrow area include potential dust emissions at the residential area which have to be mitigated in the dust management plan.

124. The cross-section from the Bishkek – Kara Balta towards Sokuluk borrow area is located at km 28. The access road to the borrow area does not include significant residential areas, but the area near the cross-section has to be considered in the dust management plan.

125. The access road towards Aksu borrow area starts from km 41. The borrow area is located roughly 5 km south from the crossroad. The access road is paved, but goes through the residential area of Belovodskoje. The hauling traffic through the residential area should be carried out only from 6.00 am through 9.00 pm to prevent significant disturbance to the local residents. Also wetting of the road will be necessary if there are unpaved sections near settlements along the section.

126. Kara Balta borrow area is located roughly 3 km north from Kara Balta. The access road goes through Kara Balta residential areas. Dust management plan has to address the unpaved sections which go through settlements along the way and the hauling traffic should be carried out only between 6.00 am and 9.00 pm.

127. Before starting material extraction the contractor will submit a plan through the Construction Supervisor (CS) to the Safeguard Department of the IPIG of the MoTC indicating the location of the proposed extraction site(s) as well as rehabilitation measures, mitigation plans, and implementation schedule for the borrow areas and access roads. Rehabilitation measures may not be necessary for borrow areas still in operation after road works have finished.

## **2. Impacts on Soils**

128. The impacts on soil originate from the compaction of soil, site preparation and clearance, and improper storage of spoil material.

129. Compaction of soil on especially agricultural land can lead to degradation of its fertility. There are agricultural lands along the length of both project road sections. To prevent soil compaction the contractor shall limit the use of heavy machinery to the existing RoW especially in the vicinity of agricultural land.
130. Site preparation and clearance includes stripping and temporary storage of top soil. If top soil is not properly managed it can lead to erosion, siltation, obstruction of water courses and drainage, and loss of top soil fertility. The associated impacts to site preparation and clearance activities are expected to be spatially limited to small strips alongside the already existing road. The removed top soil will be stored for re-use and long term stockpiles of top soil will be protected against erosion. This will be done for example through sawing fast growing vegetation such as grass on the stockpiles.
131. To ensure proper soil management the contractor will submit a soil management plan prior to commencing operation. This plan will include measures for minimizing water and wind erosion, measures to minimize loss of fertility in top soil, timeframes, haul routes, disposal sites, and a re-cultivation plan in case of new borrow pits need to be opened. It will describe the mitigation measures to be taken from the beginning of the project until final disposal of spoil materials. Upon completion of the project, the contractor shall provide spoils stockpiles with grass cover.

### **3. Recycling of Construction Materials**

132. Recycled material from the existing pavement and special recycling techniques are used in reconstruction of the pavement layers. The cost effectiveness of reconstruction measures could be enhanced greatly by the application of recycled pavement materials. Recycling options include hot mix recycling (HMR) with/without new materials and cold mixing recycling with/without new materials.
133. Recycled material will be used to the largest extent feasible to reduce the volume of spoils that needs to be disposed of.
134. Prior to commencing the activities, the contractor will submit a waste management plan indicating detailed management of the waste produced in the project, including proper waste disposal sites.

### **4. Asphalt Plants and Aggregate Crushers**

135. Impacts from asphalt plants include pollutant and odor emissions, possible water pollution from bitumen spills, and safety risks. The impacts can potentially be minimized by acquiring the needed asphalt from an existing asphalt plant. In case a new asphalt plant must be set up, certain provision and mitigation measures have to be taken.
136. Aggregate crushers produce noise and dust emissions, and they require certain mitigation measures.

137. To ensure minimal impacts on settlements and productive land, the asphalt plants and aggregate crushers must be located downwind of settlements at a distance of 1000 meters or more.
138. In road rehabilitation the most severe possible water quality impact could come from spilled bitumen or any petroleum products used to thin it with. Bitumen is stored in drums which may leak or which are often punctured during handling after long periods (more than 6 months in the elements) of storage. Bitumen will not be allowed to enter either running or dry streambeds and nor can be disposed of in ditches or small waste disposal sites prepared by the contractor. Bitumen storage and mixing areas must be protected against spills and all contaminated soil must be properly handled. Storage areas should be lined with impermeable layer to mitigate impacts of potential spills. As a minimum, these areas must be designed so, that any spills can be immediately contained and cleaned up.
139. The contractor shall have provisions for spill and fire protection equipment and shall submit an emergency response plan (in case of spills, accidents, fires and the like) prior to operation of the plant, and asphalt plants shall not be located close to plantations and productive land.
140. Bitumen storage and mixing areas must be protected against spills and all contaminated soil must be properly handled according to legal environmental requirements. Such storage areas must be contained so that any spills can be immediately contained and cleaned up.
141. Prior to commencing operation of the asphalt plant, the contractor must receive all relevant permissions and the site selection for the asphalt plant and aggregate crusher must be approved by the Safeguard Department of the IPIG in MoTC.
142. Both, asphalt plant and aggregate crusher are sources of emission of noise, vibrations and air pollutants. Therefore regular monitoring measurements shall be conducted at these facilities as described in the monitoring table of the EMP.

## **5. Water**

143. The road crosses several water streams (rivers, channels, irrigation canals (aryks)). The Bishkek – Kara-Balta stretch: the Sokuluk (28,3 km) and the Ak-Suu (44,65 km) rivers.
144. Potential impacts on the water courses include siltation, change of surface hydrology in the water crossings by increased sediment load, and pollution of these water ways.
145. The impacts of stockpiling of top soil and material are mitigated by storing the material at a safe distance from nearby surface waters and by providing for long term stockpiles a grass cover. These mitigation measures prevent also the impacts of increased sediment load on surface hydrology. Settlement ponds must be implemented to places where construction activities come near the natural water courses.

146. When construction activities are being carried out on or in the vicinity of watercourses improper handling and storage of materials (concrete, asphalt, lubricants, fuels, solvents) may pose the risk of water contamination. In addition embankments and construction materials (fill, sand, and gravel) are subject to wash out with rainwater. Oil and grease concentrations in surface waters will increase especially if oil leaks from engines are not properly controlled. Appropriate mitigation measures must be taken, such as regular maintenance of the construction equipment to prevent oil leaks, in addition chemicals and oil will be stored in secure, impermeable, and bounded area far away from surface waters.
147. Possible impact on water quality of surface waters refers to the rivers that are crossed by the Project road. Therefore water quality monitoring shall be conducted during construction stage as indicated in the alignment sheets and the monitoring table. Reference measurements shall be conducted prior to construction start, monitoring measurements shall than be conducted during construction stage on a quarterly basis.

## **6. Air Quality, Noise and Vibration**

148. Air quality impacts originate from different sources but are temporary. Sources include construction machinery, fugitive emissions from asphalt plants, aggregate crushers, and dust generated from construction works, haul roads, exposed soils, and material stock piles. Noise is temporary and results from operating construction machines. Vibration is caused by operating of construction machinery and hauling of materials.
149. Air quality impacts from asphalt plant, aggregate crushers, and dust emissions have been addressed in the above sections.
150. The following mitigation measures will be implemented to by the contractor to reduce emission levels of construction equipment: (i) maintenance of construction equipment in good condition and avoiding, as much as possible, idling of engines; (ii) banning of the use of machinery or equipment that cause excessive pollution (e.g., visible smoke); (iii) the contractor should utilize construction machinery with low emission levels.
151. Settlements next to the project road will be exposed to some degree of vibration, but it will be insignificant to settlements more than 50 m away from the road. As a mitigation measure the contractor shall try to find alternative routes for hauling which have few settlements within 50 m of the road.
152. Negative effects of noise are mitigated by limiting construction work to 06.00 am - 9.00 pm within 500 m of settlements, and by limiting hauling traffic through settlements. A limit for maximum noise of 70 dB(A) is set and strictly enforced in the vicinity of sensitive receptors within settlements. Construction stage noise monitoring is conducted as described in the EMP.

## **7. Operation of Working Camps**

153. Impacts produced by workers camps are solid and liquid waste, equipment maintenance related pollutants spills, potential spills from stored materials (chemicals, fuels, etc.), competition for water resources with local needs, and health and safety risks to workers and locals, including risk of HIV / Aids and other STD's.
154. Prior to construction works, the contractor shall provide a comprehensive SSEMP covering the following aspects as described in the chapter "Environmental Management Plan". .
155. The camp shall not be set up on top of a ground water area, nor near any surface water areas.
156. Prior to commencing operation the contractor shall indicate proper sources of drinking and construction water which won't compete with local needs. This will be done together with local authorities.
157. For health and safety protection of workers and adjacent communities the following shall be provided: (i) Adequate health care facilities (including first aid facilities) within construction sites; (ii) Training of all construction workers in basic sanitation and health care issues, general health and safety matters, and on the specific hazards of their work; (iii) Personal protection equipment for workers, such as safety boots, helmets, gloves, protective clothing, goggles, and ear protection in accordance with legal legislation; (iv) Clean drinking water to all workers; (v) Adequate protection to the general public, including safety barriers and marking of hazardous areas; (vi) Safe access across the construction site to people whose settlements and access are temporarily severed by road construction; (vii) Adequate drainage throughout the camps so that stagnant water bodies and puddles do not form; (viii) Sanitary latrines and garbage bins in construction site, which will be periodically cleared by the contractors to prevent outbreak of diseases.
158. Where feasible the contractor will arrange the temporary integration of waste collection from work sites into existing waste collection systems and disposal facilities of nearby communities. This shall be taken into consideration when deciding the place for the camp.
159. The contractor shall hire a qualified health and safety expert who will provide safety training to the staff according to the requirements of the individual work place. Prior to the commencement of works, the work site personnel shall be instructed about safety rules for the handling and storage of hazardous substances (fuel, oil, lubricants, bitumen, paint etc.) and also the cleaning of the equipment. In preparation of this the contractor shall establish a short list of materials to be used (by quality and quantity) and provide a rough concept explaining the training / briefing that shall be provided for the construction personnel.
160. The contractor shall provide information to workers, encouraging changes in individual's personal behavior and encouraging the use of preventive measures. The

goal of the information is to reduce the risk of HIV / STD transmission among construction workers, camp support staff and local communities.

## **8. Traffic Impacts**

161. Traffic impacts of the road rehabilitation project will include disturbance of traffic along the road sections.
162. Prior to commencing operations the contractor shall submit a traffic management plan to local traffic authorities, and provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions.
163. During the construction work the contractor will arrange for adequate traffic flow around construction areas.
164. The contractor shall enhance traffic safety by providing adequate signalization, lighting, traffic safety signs, barriers and flag persons for traffic control. Adequate training shall be provided to the workers on traffic control prior to commencing operations.

## **C. OPERATION PHASE**

### **1. Traffic impacts**

165. The proposed project will result in better road condition, increased speed of vehicles, and the increase of traffic volumes along the Bishkek – Osh road. This will lead to such impacts as elevated emissions and noise levels, and increased risk of accidents with possible result in spilled pollutants.
166. Road safety features such as speed control signs, proper road markings, streetlights, pedestrian crossing, livestock crossings and other visual means must be provided to the road.

### **2. Damages to Drainage and Erosion**

167. Damaged drainage can result in damage to local irrigation systems, and erosion can have adverse effect on the road.
168. These damages will be mitigated by conducting routine monitoring of drainage and erosion at least twice a year. In case there are any damages identified these have to be repaired. Warranty from the side of the contractor is for 1 year. After this year maintenance and repair, if required have to be done by MoTC.

## **D. SOCIO-ECONOMIC ENVIRONMENT**

169. The project is not expected to have significant negative socio-economic impacts. The rehabilitation of the road will be done using the existing RoW so there will be no need to demolish any residential houses. People are not living within the RoW, but operating their business and their enterprises within the RoW. Resettlement Specialist will issue LARP covering assessment of loss and compensation procedure.
170. During construction stage significant impacts on human and socioeconomic environment refer to noise emissions and vibrations and emission of air pollutants, especially within the settlements and at locations where the Project road runs close to sensitive receptors such as schools, mosques, hospitals, bazars or other socioeconomic infrastructure. To make sure that existing legal standards concerning noise, vibrations and air pollutants are not exceeded monitoring measurements shall be conducted at a regular basis as indicated in the Monitoring Program of the EMP.

### **2. Accessibility and Regional Cooperation**

171. The improvement of the Bishkek – Osh road is extremely important for a landlocked country such as Kyrgyz Republic. It provides access to domestic and regional markets. It will help provide services throughout the country and generation of employment is also enhanced. The Bishkek-Osh road accounts for a third of the international road corridor network in the Kyrgyz Republic, and links the country to Kazakhstan in the north, Uzbekistan and Tajikistan in the south, and the People's Republic of China in the southeast. It crosses four of the seven provinces of the country and serves about 2 million people. It is the only direct surface link between the southern and northern parts of the country making it crucial for maintaining the country's social, political, and economic integrity.

### **3. Community Impacts**

172. The impacts of the proposed project on communities along the road sections are mainly positive in the form of better access to markets, improved transportation network, reduced wearing out of vehicles, etc. Negative impacts of the project are related mostly to the construction phase and impacts originating from the construction camp. Construction worksites may place stresses on resources and infrastructure of nearby communities. This may lead to friction between local residents and the temporary workers.
173. To mitigate the construction camp related impacts, the contractor shall arrange the facilities, services, and water supply of the work camp so that it won't compete on the same resources with nearby communities. The contractor shall also employ, to the

largest extent feasible, people from the local communities to the workforce. Local communities will also be preferred, to largest extent feasible, when employing people for the tree planting works, drainage cleaning, and other suitable tasks.

#### **4. Proper Construction Practices**

174. Contractors' conformity with contract procedures and specifications during construction will be carefully monitored. Stakeholder consultations showed that prime contractors tended to use sub contractors without ensuring that they conform to general construction guidelines (good engineering practice and standard good working practices). Such practices reduce the quality of construction and the benefits of the Project. Contractors will be made to follow standard construction practices, monitored and supervised by construction supervision consultants employed under the Project.

#### **5. Health, Safety and Hygiene**

175. Construction camps are likely to have public health impacts. There will be a potential for diseases to be transmitted, exacerbated by inadequate health and safety practices. As mentioned in the previous chapter, the contractor will be required to recruit a health, and safety specialist to address such concerns in the work sites. The specialist shall also liaise/work with the nearby communities when it is necessary for mitigation of health and safety concerns.
176. Mitigation measures include (i) provision of adequate health care facilities within construction sites; (ii) a health and safety specialist, appointed by the contractor for each camp, and first aid equipment and facilities; (iii) training/orientation of all construction workers in basic sanitation and health care issues (e.g. HIV/AIDS and other sexually transmitted infections), general health and safety matters, and on the specific hazards of their work prior to commencing operation; (iv) personal protection equipment for workers, such as safety boots, helmets, gloves, protective clothing, goggles, and ear; (v) clean drinking water to all workers; (vi) adequate protection to the general public, including safety barriers and marking of hazardous areas in accordance with relevant legislation and regulations; (vii) safe access across the construction site to people whose settlements and access are temporarily severed by road construction; (viii) adequate drainage throughout the camps to ensure that disease vectors such as stagnant water bodies and puddles do not form; and (ix) Septic tank and garbage box will be set up in construction sites, which will be periodically cleared by the contractors to prevent outbreak of diseases. Where feasible the contractor will arrange the temporary integration of waste collection from work sites into existing waste collection systems and disposal facilities of nearby communities.

## **6. Transport of Hazardous and Toxic Materials**

177. Transport of potentially hazardous or toxic material on the road poses a risk to the local population. Impacts in case of an accident which causes a spill may include pollution of surface water or ground water through leaching.
178. The contractor shall include action plan to mitigate such impacts to the traffic emergency response plan for the operation phase of the road.

## **VII. Environmental Planning and Management**

### **A. Institutional Framework**

179. The relevant organizational entities for the project include the Government of the Kyrgyz Republic, Ministry of Finance (MoF), Ministry of Transport and Communication (the EA), Investment Projects Implementation Group (IPIG) under MoTC, the State Agency of Environment Protection and Forestry (SAEPF) which is in charge of issuing environmental license, and ADB.
- MoTC is responsible for transport sector development and is the EA for the project. MoTC has overall responsibility for planning, design, implementation, and monitoring of the project.
  - IPIG is working under MoTC and will carry out the responsibilities assigned to MoTC.
  - SAEPF is responsible for environmental policy, regulatory development, and oversight of environmental assessments and permits. It's responsibilities include issuing of environmental licence.
  - MoF is the responsible government body for coordination with ADB and other donors for foreign assistance.
180. Responsibilities for the implementation of the monitoring requirements of this report are summarized in Tab. 16 (Environmental Monitoring Plan).
181. The following measures will be taken by the Consultant and by IPIG to perform environmental compliance with the EMP and Monitoring Plan during Project implementation:
- (i) The tender and contract documents will clearly set out the contractor's obligations to undertake environmental mitigation measures set out in the Environmental Management Plan.
  - (ii) The recommended environmental mitigation costs are included as separate items in the Bills of Quantities. This will ensure that there is specific environmental mitigation budget which will be implemented as required. During the procurement, contractors will be encouraged to include these costs in their rates and present the mitigation cost as a line item in the Bill of Quantities. There will be an identified extra payment in the contract to ensure measures are costed and carried out.

- (iii) Each contractor will recruit an environmental, health and safety manager, who will be responsible for implementing the contractors' environmental responsibilities. The manager will also be responsible for health and safety aspects of work sites. Before commencing physical construction, Contractor will prepare site-specific EMPs (SEMPs), submit to Construction supervision Consultant (CSC) for endorsement and IPIG for approval.
- (iv) CSC will conduct environmental monitoring and assist IPIG in implementing EMP and supervising the implementation of mitigation measures by the contractors.

## **B Reporting Requirements**

182. MoTC will monitor and measure the progress of implementation of the EMP. In this regard semiannual monitoring reports during construction stage will be prepared by the Construction Supervision Consultant and submitted to MoTC within 1 month after the reporting period and then disclosed at ADB and MoTC websites.

## **C Environmental Management Plan**

183. The EMP describes the various measures proposed under this Project, which were designed to avoid, mitigate, or compensate the adverse environmental impacts that may result from the Project. As such the EMP considers all phases of the Project cycle, namely the detailed design, construction and operational phases of the Project.
184. To ensure that the proposed mitigation measures will be carried out by the contractors during the construction stage, the design consultant will clearly set out in the tender and contract documents the contractor's obligation to undertake the respective environmental mitigation measures.
185. The EMP consists of two tables. Table 1 summarizes the environmental mitigation measures, and table 2 provides an overview of the environmental monitoring. At the end is a statement which includes the timeframes and responsibilities for carrying out the environmental monitoring.

Tab. 15

Summary of Environmental Mitigation Measures

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
<b>DETAILED DESIGN PHASE</b>				
Road alignment in areas of tree plantations. There is a considerable number of tree losses involved. 11.000 trees need to be felled on the Bishkek to Kara Balta section.	Tree losses that cannot be prevented. Main species are <i>Juglans regia</i> , <i>Acer negundo</i> , <i>Ulmus carpinifolia</i> , <i>Populus alba</i> , <i>Salix alba</i> , <i>Robinia pseudoacacia</i> .	<p>Any tree losses are compensated by new plantations.</p> <p>Plantations shall be conducted after technical works have been completed. Planting time shall be restricted to spring (March till April) and/or autumn (September till October).</p> <p>Locations for tree plantings are within the existing Right of Way (RoW) at the locations where tree losses occur.</p> <p>Trees to be planted shall have the following parameters: 1,5 – 2 m height, age 5 – 6 years. Distance in between individual trees shall be 6 – 8 m. Species: <i>Juglans regia</i>, <i>Acer negundo</i>, <i>Ulmus carpinifolia</i>, <i>Populus alba</i>, <i>Salix alba</i>, <i>Robinia pseudoacacia</i>.</p>	Design Consultant	Safeguard Department in IPIG of MoTC
Rehabilitation and/or replacement of existing culverts, implementation of new culverts?	Potential damage to local irrigation system if new culverts should not be sufficiently dimensioned or in case that not all existing culverts should be rehabilitated in the course of the road rehabilitation.	In the course of the road rehabilitation all existing culverts will be cleaned, repaired or replaced, depending on their respective conditions. All culverts are sufficiently dimensioned in order to prevent any damages or blockages to the existing local irrigation systems.	Design Consultant	Safeguard Department in IPIG of MoTC
Rehabilitation / reconstruction of 7 bridges.	Potential water erosion processes at bridge and river embankments.  Reference to Photo	Design of erosion protection measures at lower parts of bridge embankments. Prefabricated concrete protection plates prevent erosion processes at the lower and lateral parts of bridge and river embankments. Detailed design of the respective protection measure is drafted in the technical design documentation for the respective bridges.	Design Consultant	Safeguard Department in IPIG of MoTC

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
Road traversing cattle crossings	Accidents because of collision with cattle	Further impacts from the road may include cattle crossing the road. This will be clarified during public hearings. Depending on the situation, mitigation measures will be specified as appropriate. Possible mitigation measures would be the provision of warning signs in accordance with relevant road safety standards. In addition, reflectors may be provided on trees in the critical sections and the road fenced near pastures.	Design Consultant	Safeguard Department in IPIG of MoTC
<b>CONSTRUCTION PHASE</b>				
Top soil preservation	Loss of top soil.	Removing of top soil occurring within site clearing corridor. Topsoil shall be removed and stored for reuse. Long-term stockpiles of topsoil will immediately be protected to prevent erosion or loss of fertility. For erosion protection it will be sown with a fast growing vegetation, e. g. grass	Contractor	Construction supervision (CS), Safeguard Department in IPIG of MoTC
Road alignment in areas of tree plantations. Embankment filling of the tree stem area.	Tree losses due to embankment fill.	<p>A maximum fill up of the tree stem area of 30 cm can be accepted. Fill up material in the tree stem area has to be organic soil.</p> <p>A filling up of more than 30 cm will damage the tree. In this case cutting can't be prevented and a new tree is to be planted as a compensation measure at the respective location within the existing RoW.</p> <p>Species to be planted are walnuts (<i>Juglans regia</i>) or poplars (<i>Populus nigra</i>).</p> <p>Plantings shall be conducted after technical works have been completed. Planting time shall be restricted to spring (March till April) and/or autumn (September till October). Quality of newly to be planted trees shall be 16 to 18 cm of stem circumference in 1 m height.</p>	Contractor	Construction supervision (CS), Safeguard Department in IPIG of MoTC

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
Bottom of embankment of designed road lying very close to tree rows	Potential damaging of trees during construction activities	Implementation of a temporary vegetation protection fence during construction activities.	Contractor	Construction supervision (CS)
The road crosses or comes close to the Sokuluk (28,3 km) and the Ak-Suu (44,65 km) rivers.	Alteration of surface water hydrology resulting in increased sediment by increased soil erosion at construction site	Implementation of settlement ponds at locations where construction site comes close to natural watercourses to retain sediments and mitigate possible impacts on water hydrology. Oil and solid waste management need to be described in the SSEMP and consider these sensitive receptors (rivers and their floodplains). No campsites are allowed near river floodplains.	Contractor	Construction supervision (CS)
Operation of borrow areas and quarries	<p>Potential disfigurement of landscape, vegetation losses and damage to access roads</p> <p>Increased dust emission</p> <p>Siltation and obstruction of surface waters</p>	<p>All proposed borrow areas are already in operation. Therefore environmental impacts concerning potential disfigurement of landscape, vegetation losses and damage to access roads are kept to a minimum.</p> <p>Wet aggregates and/or provide cover on haul trucks to minimize dust emission and material spillage. Locate stockpiles away from surface waters.</p> <p>Prior to start material extraction the contractor shall submit his SSEMP through the Construction Supervisor (CS) to the Safeguard Department of the IPIG of the MoTC indicating the location of the proposed extraction site as well as rehabilitation measures and implementation schedule for the borrow areas and access roads. Rehabilitation measures may not be necessary for borrow areas still in operation after road works have finished. The SSEMP needs to address the sensitive issues of avoidance of transportation thru residential areas as far as technically feasible and closure rehabilitation.</p>	Contractor	Construction supervision (CS), Safeguard Department in IPIG of MoTC

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
Operation of aggregate crusher	Increased dust emission and noise emission	Careful site selection of aggregate crusher in order not to interfere with any sensitive receptor. Distance to next settlement and residential houses at least 1000 m downwind. Site selection for aggregate crusher has to be approved by the Safeguard Department in the IPIG of the MoTC.	Contractor	Construction supervision (CS), Safeguard Department in IPIG of MoTC
Operation of asphalt plant	Odor emission and safety risks	Asphalt plants shall be 1000 m downwind from any settlements and residential houses.  Provide spill and fire protection equipment and submit an emergency response plan (in case of spills, accidents, fires and the like) to the authority in responsibility prior to operation of the plant.  Secure official approval for installation and operation of asphalt plants from MoTC.	Contractor	Construction supervision (CS), Safeguard Department in IPIG of MoTC
	Water pollution due to spilled bitumen	Bitumen will not be allowed to enter either running or dry streambeds nor shall it be disposed of in ditches or small waste disposal sites prepared by the contractor.  Bitumen storage and mixing areas must be protected against spills and all contaminated soil must be properly handled according to legal environmental requirements. Such storage areas must be contained so that any spills can be immediately contained and cleaned up.	Contractor	Construction supervision (CS)
Site selection, site preparation and operation of contractor's yard	Potential soil and water pollution	The contractor shall submit documents for approval (short statement and site plan in appropriate scale) which indicate: <ul style="list-style-type: none"> <li>Site location, surface area required and layout of the work camp. The layout plan shall also contain details of the proposed measures to address adverse environmental impacts resulting from its installation.</li> </ul>	Contractor	Construction supervision (CS); Safeguard Department in IPIG of MoTC

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<ul style="list-style-type: none"> <li>• Sewage management plan for provision of sanitary latrines and proper sewage collection and disposal system to prevent pollution of watercourses;</li> <li>• Waste management plan covering provision of garbage tons, regular collection and disposal in a hygienic manner, as well as proposed disposal sites for various types of wastes (e.g., domestic waste, used tires, etc.) consistent with appropriate regulations;</li> <li>• Description and layout of equipment maintenance areas and lubricant and fuel storage facilities including distance from water sources and irrigation facilities. Storage facilities for fuels and chemicals will be located away from watercourses. Such facilities will be bounded and provided with impermeable lining to contain spillage and prevent soil and water contamination.</li> </ul> <p>Prior to the commencement of works the site installations shall be inspected for approval.</p> <p>The selected site will not be on top of ground water area or near surface waters.</p>		
	Competition for water resources	Prior to establishment of the work camps, conduct consultations with local authorities to identify sources of water that will not compete with the local population.	Contractor	Construction supervision (CS)
Site selection, site preparation and operation of contractor's yard (continuation)	Health and safety risks to workers and adjacent communities	<p>For health and safety protection of workers and adjacent communities the following shall be provided:</p> <ul style="list-style-type: none"> <li>• adequate health care facilities (including first aid facilities) within construction sites;</li> <li>• training of all construction workers in basic sanitation and health care issues, general health and safety matters, and on the</li> </ul>	Contractor	Construction supervision (CS); Safeguard Department in IPIG of MoTC

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<p>specific hazards of their work;</p> <ul style="list-style-type: none"> <li>• personal protection equipment for workers, such as safety boots, helmets, gloves, protective clothing, goggles, and ear protection in accordance with legal legislation;</li> <li>• clean drinking water to all workers;</li> <li>• adequate protection to the general public, including safety barriers and marking of hazardous areas;</li> <li>• safe access across the construction site to people whose settlements and access are temporarily severed by road construction;</li> <li>• adequate drainage throughout the camps so that stagnant water bodies and puddles do not form;</li> <li>• sanitary latrines and garbage bins in construction site, which will be periodically cleared by the contractors to prevent outbreak of diseases. Where feasible the contractor will arrange the temporary integration of waste collection from work sites into existing waste collection systems and disposal facilities of nearby communities;</li> </ul>		
Work site operation / Operation of equipment maintenance and fuel storage areas	Worker's health and soil / water pollution	The contractor shall hire a qualified health and safety expert who will provide safety training to the staff according to the requirements of the individual work place. Prior to the commencement of works, the work site personnel shall be instructed about safety rules for the handling and storage of hazardous substances (fuel, oil, lubricants, bitumen, paint etc.) and also the cleaning of the equipment. In preparation of this the contractor shall establish a short list of materials to be used (by quality and quantity) and provide a rough concept explaining the training / briefing that shall be provided for the construction personnel.	Contractor	Construction supervision (CS); Safeguard Department in IPIG of MoTC

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<p>Locate storage facilities for fuels and chemicals away from watercourses. Such facilities will be bounded and provided with impermeable lining to contain spillage and prevent soil and water contamination.</p> <p>Store and dispose waste/used oil consistent with environmental legal requirements.</p> <p>Work site restoration: After completion of construction works the contractor shall execute all works necessary to restore the sites to their original state (removal and proper disposal of all materials, wastes, installations, surface modeling if necessary, spreading and leveling of stored top soil).</p>		
Operation of construction camp	Road construction projects bear a high potential risk to affect local communities and the health and well-being of those that live in or near to the temporary work camps by supporting the spread of STD and HIV/AIDS. In addition, the transport sector itself actually helps the epidemic, as infrastructure and associated transport services give people and infections mobility.	Providing information to workers, encouraging changes in individual's personal behavior and encouraging the use of preventive measures. The goal of the information is to reduce the risk of HIV / STD transmission among construction workers, camp support staff and local communities.	Contractor	Construction supervision (CS), Ministry of Health
Earth works and various construction activities	Loss of topsoil	Topsoil shall be removed and reused to cover areas where excess materials will be dumped and on road embankments. In addition a soil management plan shall be provided detailing measures to be undertaken to minimize effects of wind and water erosion on stockpiles, measures to minimize loss of fertility of top soil, timeframes, haul routes and disposal sites.	Contractor	Construction supervision (CS)
Earth works and various construction activities (continuation)	Siltation of surface waters and/or impact on soils due to improper disposal of excess materials	Mostly all excavated material will be reused. In addition the reclaimed asphalt pavement will be recycled for the construction of new pavement. Thus potential impacts due to the need for disposal of excess material will be kept to a minimum.	Contractor	Construction supervision (CS)

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
	Competition for water resources	Conduct consultation with local authorities to identify sources of water (for spraying and other construction requirements) that will not compete with the local population.	Contractor	Construction supervision (CS)
	Air pollution due to exhaust emission from the operation of construction machinery	The contractor will maintain construction equipment to good standard and avoid, as much as possible, idling of engines. Banning of the use of machinery or equipment that cause excessive pollution (e.g., visible smoke).	Contractor	Construction supervision (CS)
	Disturbance of adjacent settlements due to elevated noise levels	Restrict work between 06.00 am to 9.00 pm within 500m of the settlements. In addition, a limit of 70 dBA will be set in the vicinity of the construction site and strictly followed.	Contractor	Construction supervision (CS)
	Soil compaction due to operation of heavy equipment	Confine operation of heavy equipment within the corridor that is absolutely necessary for the road construction to avoid soil compaction and agricultural used land close to the road.	Contractor	Construction supervision (CS)
Earth works and various construction activities (continuation)	Traffic impairment	<p>Submit a traffic management plan to local traffic authorities prior to mobilization.</p> <p>Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions</p> <p>Allow for adequate traffic flow around construction areas.</p> <p>Provide adequate signalization, appropriate lighting, well - designed traffic safety signs, barriers and flag persons for traffic control.</p>	Contractor	Construction supervision (CS), Local / regional department of MoTC
Within settlements, encroachment into private and residential land	Dislocation or involuntary resettlement of people.	Resettlement Specialist will issue LARP covering assessment of loss and compensation procedure.	MoTC	MoTC
Within settlements, encroachment on business assets and / or Disturbance to business, people,	Loss of businesses and income of people operating their business within the existing RoW	Resettlement Specialist will issue LARP covering assessment of loss and compensation procedure. In addition the following mitigation measures shall be	MoTC	MoTC

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
activities and socio-cultural resources due to construction work		<p>implemented:</p> <p>Inform all residents and businesses about the nature and duration of work well in advance so that they can make necessary preparations Limit dust by removing waste soil quickly; by covering and watering stockpiles, and covering soil with tarpaulins when carried on trucks</p> <p>Increasing workforce and use appropriate equipment to complete the work in minimum time in the important areas</p> <p>Avoid construction work in sensitive times like festivals near religious places</p>		
Within settlements disproportionate encroachment on poor people's assets.	Loss of wealth and property of poor people. Poor and vulnerable households might be affected.	Resettlement Specialist will issue LARP covering assessment of loss and compensation procedure.	MoTC	MoTC
Construction activities in close vicinity to existing infrastructure such as water supply pipes and other facilities, waste water discharge facilities, electricity lines etc.	Damage to infrastructure, supply cuts of infrastructure services.	<p>Measures will be ensured in engineering designing to avoid any disturbance to the existing infrastructure.</p> <p>Prior to construction start the respective service agencies shall be informed about the construction work. Coordinate with respective agencies and provide prior information to the public in case of any required disruption in services during construction</p>	Contractor	Construction supervision (CS); Safeguard Department in IPIG of MoTC
Rehabilitation works within villages and along sensitive receptors such as schools and hospitals. List of sensitive receptors is provided in the alignment sheets.....	Noise exceeding applicable noise standards. Vibrations may result in damage to local infrastructure, including private property and local (haulage) roads	<p>For sensitive receptors such as schools and hospitals applicable noise standards shall be complied with as far as technically feasible by means of noise measurements and in case of exceedence of standards, ascribe of time restrictions for construction activities between 6 am and 6 pm.</p> <p>For potential damages to local infrastructure,</p>	Contractor	Construction supervision (CS); Safeguard Department in IPIG of MoTC

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	Potential Impact	Mitigation measures	Institutional Responsibility	
			Implement	Monitor
		<p>including private property and local (haulage) roads, compensation procedures will have to be established prior to the beginning of construction and approved by the engineer.</p> <p>In addition grievance redress procedures shall be put in place to facilitate communication between the contractor and potentially affected people. In addition haul routes and construction site access roads should be discussed and jointly approved between the contractor and local officials to minimize the risk of conflicts.</p>		
<b>OPERATION PHASE</b>				
Increased traffic flow	Elevated levels of gaseous and noise emissions due to increased traffic. In addition increased pedestrian vs. vehicle accidents due to traffic volume and higher speed as a result of improved road design	Integrate in the engineering design safety features such as speed control signs, proper road markings, streetlights, pedestrian crossing, livestock crossing and other visual means.	Design Consultants	Construction Supervision (CS)
Increased traffic volumes and higher vehicle speeds	Increased risk of accidents with possible spills of harmful substances	Spill-contingency plan A contingency plan or emergency response plan is a set of procedures to be followed to minimize the effects of an abnormal event on the Project roads, such as a spill of oil, fuel or other substances that may harm drinking water resources or have adverse effects on the natural balance of sensitive areas. Additional measures to mitigate risk of accidents and spill of harmful substances are speed control and weight stations.	MoTC	MoTC
Damaged drainage or uncontrolled erosion.	Harmful environmental impacts resulting from damaged drainage or uncontrolled erosion.	Routine monitoring of drainage and erosion control at least twice a year.	Safeguard Department in IPIG of MoTC	Safeguard Department in IPIG of MoTC

186. Prior to construction works, the contractor shall provide a comprehensive SSEMP covering the following aspects:

- Dust management which shall include schedule for spraying on hauling and access roads to construction site and details of the equipment to be used
- Layout of the work camp and details of the proposed measures to address adverse environmental impacts resulting from its installation
- Sewage management including provision of sanitary latrines and proper sewage collection and disposal system to prevent pollution of watercourses
- Waste management covering provision of garbage bins, regular collection and disposal in a hygienic manner, as well as proposed disposal sites for various types of wastes (e.g., domestic waste, used tires, etc.) consistent with appropriate regulations
- Description and layout of equipment maintenance areas and lubricant and fuel storage facilities including distance from water sources and irrigation facilities. Storage facilities for fuels and chemicals will be located away from watercourses. Such facilities will be bounded and provided with impermeable lining to contain spillage and prevent soil and water contamination
- Soil Management Plan detailing measures to be undertaken to minimize effects of wind and water erosion on stockpiles of topsoil and excess materials, measures to minimize loss of fertility of top soil, timeframes, haul routes and disposal sites for excess materials.
- Emergency response plan (in case of spills, accidents, fires and the like) prior to operation of the asphalt plant
- Method statement or plan for the execution of bridge construction works including measures that will be undertaken to address adverse environmental impacts such as erosion of river embankment and siltation of watercourses that may result from such activities

187. The SSEMP shall be submitted by the contractor for approval to the Construction Supervision Consultant

#### **D. Environmental Monitoring Plan**

188. Environmental monitoring is an important aspect of environmental management during construction and operation stages of the project to safeguard the protection of environment. During construction, environmental monitoring will ensure the protection of embankment from potential soil erosion, borrow pits restoration, quarry activities, location of work sites, material storages, asphalt plants, community relations, and safety provisions. During operation, air, noise, and surface water quality monitoring will be important parameter of the monitoring program.

#### **Tab. 16 Environmental Monitoring Plan**

Issue	What parameter is to be monitored?	Where is the parameter to be monitored	How is the parameter to be monitored?	When is the parameter to be monitored? Frequency	Institutional responsibility
<b>Construction stage</b>					
<b>Water quality</b> in surface waters (rivers)	pH, dissolved oxygen, oil products, turbidity, total suspended solids, conductivity, temperature, lead	Downstream where the Project road crosses the rivers Sokuluk, Ak-Suu and the River at Belovodskoye village.	Measurement either directly in river water with a suitable measurement device or sample taking and measurement in a certified laboratory	Second round of baseline monitoring measurements to be conducted before construction start. Then on a quarterly basis during construction stage	CSC and Safeguard department within IPIG of the MoTC with assistance by SC.
<b>Noise/ vibration</b> Rehabilitation works within settlements at locations where the Project road runs close to sensitive receptors such as schools, hospitals, mosques, bazars or other sensitive socioeconomic infrastructure.	Prior to construction and during construction activities within identified sensitive hotspots and sensitive receptors close vicinity of sensitive receptors regular control of noise level by portable measure instrument. In case noise standards are exceeded implementation of time restrictions for construction activities	At sensitive receptors within settlements	By means of portable noise / vibration measurement device	Second round of baseline monitoring measurements to be conducted before construction start. Then a quarterly basis during construction stage.	CSC and Safeguard department within IPIG of the MoTC with assistance by SC.
<b>Air quality</b> deterioration	Dust, noise, SO <sub>2</sub> , NO <sub>x</sub> , CO	Within settlements where the Project road comes close to sensitive receptors such as schools, hospitals, mosques, bazars or other sensitive socioeconomic infrastructure. At asphalt plant and at aggregate crusher.	By means of suitable portable measurement device	Second round of baseline monitoring measurements to be conducted before construction start. Then on a quarterly basis during construction stage.	Safeguard department within IPIG of the MoTC with assistance by SC.

<b>Issue</b>	<b>What parameter is to be monitored?</b>	<b>Where is the parameter to be monitored</b>	<b>How is the parameter to be monitored?</b>	<b>When is the parameter to be monitored? Frequency</b>	<b>Institutional responsibility</b>
<b>Potential tree losses</b> because tree stem area is subject to embankment filling.	Trees located within the newly designed embankment.	At respective tree locations.	Inspections; observation. An embankment fill of up to 30 cm at the bottom of the tree stem area can be accepted. A filling up of more than 30 cm will damage the tree and cutting will be necessary. Decision is to be made by the construction supervision engineer.	During construction phase.	Construction Supervision (CS)
<b>Top soil preservation</b>	Stockpiling and means of protection	Job site	Inspections; observation	Upon preparation of the construction site, after stockpiling and after completion of works on shoulders	Construction Supervision (CS)
<b>Equipment servicing and fuelling</b>	Prevention of spilling of oil and fuel	Contractor's yard	Inspections; observations	Unannounced inspections during construction	Construction Supervision (CS)
<b>Worker's safety and health</b>	Official approval for worker's camp; Availability of appropriate personal protective equipment; Organization of traffic on the construction site  Provision of safety training to the staff according to the requirements of the individual work place	Job site and worker's camp	Inspection; interviews; comparisons with the Contractor's method statement	Weekly site visits by the hired Health and safety expert.  Unannounced inspections during construction and upon complaint.	Construction Supervision (CS)
<b>Worker's education on AIDS and STD</b>	Has relevant education been provided?	To be determined by assigned Construction Supervision	To be determined by assigned Construction Supervision	After beginning of works and at appropriate intervals throughout construction	Construction Supervision (CS)
<b>Material supply</b> Asphalt plant	Possession of official approval or valid operation license	Asphalt plant	Inspection	Before work begins	Construction Supervision (CS)

<b>Issue</b>	<b>What parameter is to be monitored?</b>	<b>Where is the parameter to be monitored</b>	<b>How Is the parameter to be monitored?</b>	<b>When is the parameter to be monitored? Frequency</b>	<b>Institutional responsibility</b>
Borrow areas	Possession of official approval or valid operation license	Sand and gravel borrow pit and / or quarry	Inspection	Before work begins	Construction Supervision (CS)
<b>Material transport</b> Asphalt	Are the truck loads covered or wetted?; Compliance with the Contractor's method statement (restricted working hours; haul routes) dust suppression methods where required	Job site / haul routes	Supervision	Unannounced inspections during work	Construction Supervision (CS)
Stone		Job site / haul routes	Supervision spot checks	Unannounced inspections during work	Construction Supervision (CS)
<b>Sand and gravel</b>		Job site / haul routes	Supervision	Unannounced inspections during work	Construction Supervision (CS)
<b>Surface water protection</b>	Contractor's compliance with his approved method statement	Bridges and Culverts	Inspection	Unannounced inspections during bridge and culvert works	Construction Supervision (CS)
<b>Air pollution from improper maintenance of equipment</b> Asphalt plant and Machinery	Exhaust fumes, dust	At site	Measurement at asphalt and crushing plants. Regular check certificate of vehicles and equipment.	Unannounced inspections during construction works	Construction Supervision (CS), State Road Administration (SRA)
<b>Planting of new road side trees</b>	Regular monitoring and control of successful growth of new planted trees	At locations of new planted trees	Replanting of trees that have died	Monitoring to be conducted in autumn so as to allow for replacement of failures	Contractor 1 <sup>st</sup> Year / Safeguard Department at IPIG in the MoTC subsequent Year(s)
<b>Operational stage</b>					

<b>Issue</b>	<b>What parameter is to be monitored?</b>	<b>Where is the parameter to be monitored</b>	<b>How Is the parameter to be monitored?</b>	<b>When is the parameter to be monitored? Frequency</b>	<b>Institutional responsibility</b>
<b>Increased road kills of animals due to higher traffic loads and vehicle speeds</b>	Road kills of animals	Along the new road	Keep records of accidents. In the case that accident hot spots with large mammals are identified, appropriate protective measures shall be elaborated (e.g. reflectors / local fencing, warning signs, speed reductions etc.)	Throughout the Year	Regional Departments of State Road Administration
<b>Increased traffic volumes may increase possible spills of harmful substances</b>	Accidents that cause spills of harmful substances	Along the new road	Counting of accidents	Throughout the Year	Safeguard Department at IPIG in the MoTC subsequent Year(s)
<b>Damaged drainage or uncontrolled erosion</b>	Leakages in drainage system and damages due to erosion	Culverts and drainage facilities	Documentation	Throughout the Year	Safeguard Department at IPIG in the MoTC subsequent Year(s)

**Tab. 17 Cost Estimate for Mitigation Measures (KGS)**

Description	Unit	Quantity	Rate KGS	Amount KGS
<u>Protection of Environment</u>				
Planting, maintenance and watering (during construction stage) of trees on the road side as explained in the EMP. Section Bishkek-Kara Balta	Pieces	10.000	700	7.000.000
Protection of trees during the construction activities.	l.s.			500.000
Clearing of Construction Corridor.	l.s.			Included in civil engineering works
Removal and Storage of Topsoil.	l.s.			Included in civil engineering works
Protection of Water Resources.	l.s.			Included in civil engineering works
Management of Solid Waste and Sewage Waste from the Construction Camp.	l.s.			Included in civil engineering works
Potential restoration of Work and Storage Sites, Quarries and Borrow Pits, Construction Site Roads.	l.s.			Included in civil engineering works
Provision of EHS Manager. and EHS Training Seminars	month	25	20.000	500.000,00
Securing of Storage and Equipment Maintenance Areas.	l.s.			Included in civil engineering works
<b>Total</b>				<b>8.000.000,00</b>

**Tab. 18 Cost Estimate for Monitoring Measurements (KGS)**

Description	Unit	Quantity	Rate KGS	Amount KGS
<u>Monitoring Measurements</u>				
Noise Monitoring over construction period Bishkek-Kara Balta	l.s.			150.000
Vibration Monitoring over construction period Bishkek Kara Balta	l.s.			150.000
Dust and air pollutants measurement over construction period, Bishkek-Kara Balta	l.s.			250.000
Water Quality Monitoring, Bishkek-Kara Balta	l.s.			70.000
<b>Total</b>				<b>620.000,00</b>

## **IX. STAKEHOLDER CONSULTATION AND INFORMATION DISCLOSURE**

### **A. Stakeholder Consultations**

189. The IEE process for the Bishkek – Osh road rehabilitation project includes stakeholder participation and consultation to help MoTC to achieve public acceptance of the project. ADB requires one Consultation for category ‘B’ projects during project preparation stages. Stakeholder consultations are to be performed so that there are public consultations held separately in the Bishkek – Kara Balta section and in the Madaniyak – Jalalabad section. The consultations shall involve a wide range of participants representing affected people, community leaders, civil society, the NGOs, and government officials.

### **B. Consultation Process and Information Disclosure**

190. Public Consultation Meetings were held on June 10 and June 11 in Voенno Antonovka village, Sokuluk city, Belovodskoye village and Poltavka village. Results of the conducted consultational meetings are attached in the annex. The following table shows a summary.

**Tab. 19 Summary table on public consultation for the Bishkek to Kara Balta Section**

<b>Time</b>	<b>Venue</b>	<b>Participants</b>	<b>Issues discussed</b>	<b>Answer and suggestions for incorporation</b>
June 10, 2013. 10:20 am to 11:45 am	Belovodskoje town, Conference hall of Moscovskiy Rayon Administration	IPIG/MOTC  Asylbek Abdygulov Safeguard Specialist  Kocks Consult Vasiliy Chernyh Deputy Team Leader, Nurul Hoque Sociologist Erik Shukurov Ecologist	Duration of road construction.	Duration will be three years.
			What will be the amount of compensation?	The compensation size will be determined additionally during the resettlement commission work, while preparing a detailed design.
			What is the forecasted traffic flow increase?	Estimated increase of road flow capacity is 4% per year over the next 20 years.
			What about construction of a by-pass road?	Construction of a new road is double expensive then rehabilitation of old road pavement. Besides there is a moratorium on seizure and transformation of the agricultural land.
			Will be the subways, drainage structures, auxiliary roads rehabilitated/constructed to relief the main road?	The subways would be rehabilitated: extended, strengthened, furnished. After the rehabilitation they would be maintained by local governments. Also the project includes construction of sidewalks, channels and drainage chutes. No additional auxiliary roads.
			How will the issue on cut plantations be solved?	First the owners of the trees to be cut will be identified. Upon implementation of the project all cut trees will be rehabilitated/compensated as 1:10. The contractor will be responsible for plantation and watering the trees during a year upon completion of construction works with following handing them over to RMD or local authority. Only local and drought-resistant species of trees and bushes would be planted.

<b>Time</b>	<b>Venue</b>	<b>Participants</b>	<b>Issues discussed</b>	<b>Answer and suggestions for incorporation</b>
			<p>What is the width of the designed road? What about the communication lines?</p>	<p>Designed width of the roadway including shoulders is up to 29 meters. Total width within the Right of Way is 50 meters. During the road construction works the culverts which are in bad conditions will be replaced. After replacement, the old ones will be handed over to local authorities. All power lines will be replaced with new ones – new posts would be erected as well as new lines. Only after complete replacement and reconnection of power lines the old ones will be demolished.</p>
			<p>What is the total cost of the project?</p> <p>Then Abdygulov Assylbek explained that there would be the Grievance Redress Mechanism to be implemented within the frameworks of the Project. This mechanism would facilitate and speed up the feedback with the public. He also informed on measures to be taken to reduce the environmental impacts. To enhance awareness among the people it is planned to distribute informative brochures containing information on social, economical and engineering aspects of the Bishkek-Osh road rehabilitation project.</p>	<p>Total cost of the project is appr. \$ 209 mln.</p>
June 11, 2013, 14:30 pm to	Petropavlovka village	IPIG/MOTC  Asylbek Abdygulov Safeguard Specialist	Who will be the contractor?	The contractor will be determined based on results of the tender. It could be both local and foreign company.

Time	Venue	Participants	Issues discussed	Answer and suggestions for incorporation
16:10 pm		Kocks Consult Vasiliy Chernyh Deputy Team Leader, Nurul Hoque Sociologist Erik Shukurov Ecologist	How will the construction works influence on the environment of Petropavlovka village? What about the current situation with maximum permissible concentration of harmful substances in vehicle emissions, noise and vibration? Is there is an excess?	Without doubt in the course of rehabilitation works the dust level will increase as well as other emissions since along with the usual traffic flow some heavy road construction equipment and heavy trucks will be engaged.  At present we have no any data on air quality, noise and vibration. In the nearest future certain measurements will be taken. The results of those measurements will be used as a basic reference environment data and will being compared with the results of the following measurements. The environment condition will be monitored within the settlements through which the road passes.
			What is the width of the designed road? What about the communication lines?	Designed width of the roadway including shoulders is up to 29 meters. Total width within the Right of Way is 50 meters. During the road construction works the culverts which are in bad conditions will be replaced. After replacement, the old ones will be handed over to local authorities. All power lines will be replaced with new ones – new posts would be erected as well as new lines. Only after complete replacement and reconnection of power lines the old ones would be demolished
			What is the total cost of the project?	Total cost of the project is appr. \$ 209 mln.
June 10, 2013, 14:15 pm to 15:40 pm	Sokuluk village, conference hall of Sokuluk ayil okmotu	IPIG/MOTC  Asylbek Abdygulov Safeguard Specialist  Kocks Consult Vasiliy Chernyh Deputy Team Leader, Nurul Hoque Sociologist Erik Shukurov Ecologist	Will the channel lines near the road in Shopokov street be destroyed or otherwise impacted?	All communication and channel lines will be either shifted or equipped by protective coats.
			What will happen to the trade outlets occurred within the project implementation zone?	All kiosks built in a light construction will be temporary shifted from the construction side and returned back upon completion of the project. Capital structures most likely will be removed. Big trade complexes will be provided with access roads. Parking is not foreseen. Construction works will cause only temporary impact by hindering access to these complexes.

Time	Venue	Participants	Issues discussed	Answer and suggestions for incorporation
			<p>What about the traffic lights, street lighting? Will they be provided? How will the road pavement and adjacent territory look?</p>	<p>Traffic lights, street lighting are foreseen by the project. Also the project includes construction of sidewalks, channels and drainage ditches. Besides it is planned to pave with asphalt the junctions 30-50 meters long as well as access roads to the gates of households. The sidewalks will be equipped with ramps. The profile of the road will be raised; there will be reinforced concrete chutes on the shoulders as well as all required engineering measures will be taken to improve the safety of the roadway. Number of bus stops will be increased and re-equipped. All road construction works will be carried out in accordance with all established standards, the construction supervision consultant will monitor the whole construction process. The service life of the road is appr. 18 years.</p>
			<p>How will the old asphalt be utilized? V. Chernyh.</p>	<p>The old asphalt will be used in the following way: 50% for construction needs and 50% for the needs of local people (repair of feeder roads and others).</p>

191. MOTC will make the environmental assessment and other environment-related documents available in accordance with Kyrgyz and ADB requirements for disclosure. Timing of disclosure is scheduled immediately after abstaining of the SEE (State Ecological Expertise) from the State Agency of Environmental Protection.
192. After Finalization the IEE reports documenting the mitigation measures and consultation process will be submitted to MoTC and ADB and will be disclosed on ADB and IPIG websites.
193. A communication plan containing the required consultation and participation activities over the whole Project cycle was prepared and is presented in the following:

### **Communication Plan**

194. Community participation has emerged as a crucial element in achieving sustainability and success in project implementation. The Communication Plan identifies the procedures used to manage communication for the Bishkek – Osh Road Improvement Project, Phase 4. The plan focuses on formal communication elements. Other communication channels exist on informal levels and enhance those discussed within this plan.
195. Participation in development activities has to be recognized as a crucial element to development initiatives. People are demanding more voice in what they want and how things ought to be done; however, actual involvement in project planning and implementation has been limited so far in many infrastructure projects. This plan is an attempt to engage stakeholders in a participatory manner.
196. The project communication plan below includes the information needed to successfully manage project information deliverables.

**Tab. 20 Communication Plan**

<b>Information to be disclosed / Activity</b>	<b>Targeted audience</b>	<b>Expected output</b>	<b>Prepared by / Person in charge</b>	<b>Preferred communication mechanism(s)</b>	<b>Required materials</b>	<b>Timeline</b>
<b>General Information</b>						
Project information to local administration, requesting no further permission are granted for encroachment of ROW	Local administration	No new permitted/legal encroachment of ROW.	IPIG	Official letter	Official letter in Russian / Kyrgyz language	7 June
<b>GRM</b>						
Announcing establishment of GRM	Affected people/community/local government/civil society	Awareness of APs, local communities and government on GRM, Complaints from APs	IPIG	Official declaration, local newspaper, notice at local administration display board, IPIG website	Declaration and GRM information leaflet in Russian / Kyrgyz language	July 17  Reminder on GRM before construction commence
Instructions and orientation for GRM Members on how to handle complaints	GRM members	Informed and trained GRM members	Resettlement Consultants/IPIG Safeguards team	Workshop / briefing	GRM Paper Russian / Kyrgyz language	PPTA will be gone
<b>LARP Preparation</b>						
Introducing LAR Commission into the detailed measurement surveys	LAR Commission members	Briefed /trained LAR commission member	Resettlement Consultants/IPIG Safeguards team	Workshop / briefing	Survey methodology and questionnaire Russian / Kyrgyz language	5 June bi-weekly
Announcement of detail measurement surveys, valuation and cut-off date	Affected people	Awareness of APs that DMS will be carried out and	Resettlement Consultants and LAR commission	Meeting with affected people	List of affected people and facilities	8 June
Announcement of	Affected people and	Awareness of	Resettlement	Leaflets, local	leaflet and	16 June

<b>Information to be disclosed / Activity</b>	<b>Targeted audience</b>	<b>Expected output</b>	<b>Prepared by / Person in charge</b>	<b>Preferred communication mechanism(s)</b>	<b>Required materials</b>	<b>Timeline</b>
Cut-off-date	potential affected people, communities, local administration	APs and local communities of cut-of-dates and registration of potential affected people	Consultants and LAR commission	newspaper, notice at local administration display board, IPIG website	press release in Russian / Kyrgyz language	
Public notice for prohibiting people from using this Right-of-way for any purpose	Local population along the project roads	Awareness of local population that no construction is permitted within the ROW	IPIG	Distribution of leaflets among the local communities, newspaper,	Leaflets, press release in Russian / Kyrgyz language	
Public Consultation on Eligibility, Entitlement and Grievance Redress Mechanism for Bishkek – Kara Balta	Affected People, NGOs, Representatives of Village, Rayons	Comments and inputs from public consultations will be reflected in Draft LARP	Resettlement Consultants, IPIG	Handouts, overhead slides, some group work and 3 presentations	Public Information Booklet in Russian / Kyrgyz language	July 2 for Moskovskii, Sokuluk, Jaiyl (three rayons)
Public Consultation on Eligibility, Entitlement and Grievance Redress Mechanism for Madaniyad-Jalabad	Affected People, NGOs, Representatives of Village, Rayons	Comments and inputs from public consultations will be reflected in Draft LARP	Resettlement Consultants, IPIG	Handouts, overhead slides, some group work and 3 presentations	Public Information Booklet in Russian / Kyrgyz language	June 19-20 <sup>th</sup> for Bazar-Korgon and Nooken (two rayons)
Draft LARF prepared which provides the overview of the Information Disclosure	Government officials at all levels, APs, Rayons	Effective LARF for current and future feeder roads	Resettlement Consultant	Framework submitted to ADB/IPIG		June 20
Focus Group/Consultation with Vulnerable APs for Bishkek – Kara Balta	Vulnerable APs	Issues on vulnerability and mitigating measures	Resettlement Consultants, IPIG	Focus group interview guide		July 4
Focus	Vulnerable APs	Issues on	Resettlement	Focus group		tbd

<b>Information to be disclosed / Activity</b>	<b>Targeted audience</b>	<b>Expected output</b>	<b>Prepared by / Person in charge</b>	<b>Preferred communication mechanism(s)</b>	<b>Required materials</b>	<b>Timeline</b>
Group/Consultation with Vulnerable APs for for Madaniyad-Jalabad		vulnerability and mitigating measures	Consultants, IPIG	interview guide		
Second Consultation on Draft LARP for <b>Bishkek – Kara Balta</b> including and information on follow up on First Public Consultation.	Affected people, NGOs, Representatives of Bishkek-Osh General Road Directorate, Village, Oblast and Rayon Administration	NGO invitation should go from IPIG. Awareness of APs on LARP mechanisms and feedback from APs	Resettlement Consultant/IPIG Safeguards team	Public consultations in Sokuluk city, Belovdskoye village, Voенno-Antonovka village.	Presentation of Summary LARP, Informative brochure in Russian / Kyrgyz language	July 24
Second Consultation on Draft LARP for <b>Madaniyat – Jalal-Abad</b> including and information and follow up on first Public Consultation. Comments on Draft LARP.	Affected people, NGOs, Representatives of Bishkek-Osh General Road Directorate, Village, Oblast and Rayon Administration	Awareness of APs on LARP mechanisms and feedback from APs	Resettlement Consultant/IPIG Safeguards team	Public consultations in Kochkor-Ata village, Bazar-Korgon village.	Presentation of Summary LARP, Informative brochure in Russian / Kyrgyz I	July 22
Disclosure of Final (Draft) LARP for <b>Bishkek – Kara Balta</b>	APs, NGOs, General Public,	Informed APs and interested public	Consultants Resettlement Team, ADB, IPIG	ADB and IPIG Website	Final LARP	26 July
Disclosure Final (Draft) LARP for <b>Madaniyat - Jalabad</b>	APs, NGOs, General Public,	Informed APs and interested public	Consultants Resettlement Team, ADB, IPIG	ADB and IPIG Website	Final LARP	26 July
<b>LARP implementation</b>						
Monitoring Survey Results	Affected people, interested public	Compliance of LARP	External Monitoring Specialist	ADB and IPIG Website	Monitoring Report	Monthly or quarterly depending on contract finalization

<b>Information to be disclosed / Activity</b>	<b>Targeted audience</b>	<b>Expected output</b>	<b>Prepared by / Person in charge</b>	<b>Preferred communication mechanism(s)</b>	<b>Required materials</b>	<b>Timeline</b>
Disclosure of Final Compliance Report	Affected people/local government/civil society/MoTC/ADB		Independent Resettlement Consultant/IPIG Safeguards Team	Publication of Final Compliance Report in MoTC website and ADB websites	Website	
<b>Environmental information disclosure during preparation phase</b>						
Consultations on Draft IEE for <b>Bishkek - Kara Balta</b> Information about impacts and sensitive receptors and mitigation measures	Local community, heads of schools, market management, administration of mosques, churches and medical facilities located along the project road, NGOs, Representatives of Bishkek-Osh General Road Directorate, Oblast and Rayon Administration	Information of people on environmental potential impacts and planned mitigation and monitoring measures  Information feedback from APs, NGOs and other concerned on environmental issues	Consultants Environmental Team, IPIG safeguard Team	Public consultations in Sokuluk city, Belovdskoye village, Poltavka village	Presentation of environmental impacts, and mitigation and monitoring measures, Factsheet	9-15 June
Consultations on Draft IEE for <b>Madaniyad - Jalabad</b> Information about impacts and sensitive receptors and mitigation measures	heads of schools, market management, administration of mosques, churches and medical facilities located along the project road, NGOs, Representatives of Bishkek-Osh General Road Directorate, Oblast and Rayon Administration	Information of people on environmental potential impacts and planned mitigation and monitoring measures Information feedback from APs, NGOs and other concerned on	Consultants Environmental Team, IPIG safeguard Team	Public consultations in Kochkor-Ata village, Bazar-Korgon village, Suzak village, Voenno-Antonovka village	Presentation of environmental impacts, and mitigation and monitoring measures, Factsheet	9-15 June

Information to be disclosed / Activity	Targeted audience	Expected output	Prepared by / Person in charge	Preferred communication mechanism(s)	Required materials	Timeline
		environmental issues				
Information about potential environmental impacts, sensitive receptors and mitigation measures	APs not able to attend the public consultation meetings	Information of people on environmental potential impacts and planned mitigation and monitoring measures	Consultants Environmental Team, IPIG safeguard Team	Distribution of Leaflets	Leaflets (information brochures)	End of June
Disclosure of Final IEE for <b>Bishkek - Kara Balta</b>	APs, NGOs, interested public	Informed APs, NGOs and interested public	Consultants Environmental Team, ADB, IPIG	ADB and IPIG Website	Final IEE and EARF	26 July
Disclosure of Final IEE for <b>Madaniyad - Jalabad</b>	APs, NGOs, interested public	Informed APs, NGOs and interested public	Consultants Environmental Team, ADB, IPIG	ADB and IPIG Website	Final IEE and EARF	26 July
<b>Environmental information disclosure during implementation phase</b>						
EMP, Health and Safety, Briefing on environmental mitigation and monitoring measures	Supervision consultant, contractors environmental staff	Information and awareness of environmental, health and safety issues among construction site staff	IPIG safeguard Team	Workshop/briefing information boards	EMP, Health and Safety guidelines	Before construction commence. October 2015
<b>Other project information</b>						
Introduce the Project, highlighting its importance and benefits to the State and community	Project Orientation Workshops for government officials, officers	Informed and aware Government officials and offices	IPIG	Consultation meeting	Presentation of project,	Before construction commence
Road safety strategy for Bishkek-Osh road	Road users, general public	Aware general public on safety issues	IPIG and Road Safety Consultant	Mass media, website	Press release	continuous

**ADB = Asian Development Bank, AP = Affected People, NGO = Non-Governmental Organization, IPIG = Investment Project Implementation Group**

**Key national NGOs in the transport sector, which should be in particular included in the information disclosure, are:**

**Road Safety NGO, Chinara Kasmambetova**

**«Aleine», Environmental movement, Emil Shukurov**

**Coalition for democracy and civil society, Altynbek Ismailov**

**«Interbilim», International center, Asel Kuttubaeva**

**Public Supervisory Council, Talant Sadakbaev**

**Maya Eralieva**

## **C. Grievance and Redress Mechanism**

### **a) Objectives**

197. Grievance redressing mechanism will be established to allow APs appealing any disagreeable decision, practice or activity arising from implementation of Rehabilitation of 52.5 km Bishkek~ Kara Balta and 67 km Madaniyak - Jalalabad roads under CAREC Corridor 3 (Bishkek-Osh Road) Improvement Project Phase 4 (45169-002) financed by ADB. APs will be fully informed of their rights and of the procedures for addressing complaints whether verbally or in writing during consultation, survey, time of compensation and implementation of the project. Care will always be taken to prevent grievances rather than going through a long redress process.

198. The GRM will cover issues related to social, environmental and other safeguard issues under ADB safeguard covenants and Kyrgyz law.

### **b) Grievance Redress Group (GRG)**

199. The GRG will be established for the duration of project implementation. The GRG is tasked with all activities needed to discuss a grievance, assess its validity, assess the scope of eventual impacts, decide eventual compensation needed and instruct/facilitate the functioning of the grievance redress mechanism.

#### **b.1 Functioning of the GRG within the Grievance Redress Mechanism**

200. The grievance redress mechanism (GRM) involves the following 2 stages appeals:

##### **Stage 1, Local (Village) Level**

The grievances will be first lodged at the level of the complainant's village community. The complainant will report his case to the Local Point of Contact (LPC) The LPC will trigger the action of the Grievance Redress Group (GRG) which will assess the situation and seek a solution through consultation with complainants, local Roads Maintenance Unit (RMU) the oblast Ombudsman, and the selected AP representative.

##### **Stage 2, Central Level**

In case within additional 15 days the grievance is still not resolved at local level the complainant will further raise the issue to MOTC's headquarters in Bishkek again with the support of the LPC, AP representatives, and the oblast Ombudsman. The GRG will decide on the eligibility and on the complaint case and prepare the resolution, subject to IPIG/MOTC consent.

201. GRM proceedings will entail one or more meetings for each complain and may require field investigations by specific technical or valuation experts. Grievance cases shared by more than one complainant may be held together as a single case.

202. For deliberations at the local level, the meetings will be held in the village of the complainant. For appeals at central level the meetings will be carried out at in MOTC office in Bishkek with field trips of GRG members to the village of the complainant.

## **b.2 Composition of GRG**

203. GRG will be established by the order of MOTC. The GRG is composed at different levels of appeal by the following individuals/officers:

### **Local level GRGs**

204. Local level GRGs will be established at each Ayil-Okmotu along the project roads with the provision of members of following composition.

**Tab. 21 Composition of local GRGs**

<b>Members</b>	<b>Position</b>
Head of Ayil-Okmotu	LPC
Representative of the RMU	Member
2 Representatives of APs	Members
Ombudsman of the Oblast	Member

### **Central level GRG**

205. The central level GRG will be represented by 6 members of the following composition.

**Tab. 22 Composition of Central GRG**

<b>Members</b>	<b>Position</b>
Head of IPIG of MoTC	Chairperson
IPIG Project Coordinator	Member
Representative of IPIG safeguards unit (environment)	Member
Representative of IPIG safeguards unit (resettlement)	Member
Representative of the RMU	Member
Ombudsman of the Oblast	Member

206. At each level of appeal, the GRG will be assisted as needed by the professional capacity needed to solve each specific case. This will include among others:

- Representatives of State Rayon Administration
- Representatives of the Rayon Branch of the State Agency for Architecture and Construction
- State Registration Services of the Rayon
- Ministry of Agricultural
- State Agency for Environment and Forestry
- Ministry of State Property

- Technical expertise from professional engineers

### **b.3 Duties of GRG Members**

#### **Local Point of Contact (LPC) / Head of Ayil-Okmotu**

207. Once the LPC Receives written notification of a complaint s/he will:

- draft a complaint memo to be signed by the complainant and the LPC indicating name of complainant, date and place of presentation of complaint, description of complaint and supporting documents, if any;
- send the complaint memo to all members of the local level GRG, summon them for a GRG meeting and establish the date of the first and (if needed following) grievance redress meetings;
- request village authorities to organize the meeting(s)
- chair the GRG meetings;
- convey requests and enquiries of the complainants to IPIG/MOTC and to the other members of the GRG at village level;
- maintain records of each meeting and each communication between him/her and the complainants;
- participate as a witness to appeal cases at all levels;
- ensure the administrative and organizational support for GRG members to work;
- disseminate the information on the GRM across the local communities concerned.

#### **RMU Representative**

208. Once notified of a complaint and summoned by the LPC to a grievance meeting the RMU representative will:

- contact the complainant(s) and draft a note with his/her understanding of the complaint;
- recording of complaints and submitted documents of proof;
- participate to all grievance meetings, provide opinions and analysis, take minutes of the discussions
- accompany eventual assessment/valuation specialists in the field
- based on the position reports of GRG members and on his/her understanding of the case prepare the final grievance report and recommendations to be sent to complainant, other GRG members and IPIG. The report may indicate that: i) the case is solved without further action; ii) that the case is solvable but requires compensation or other action or iii) that the case remains unsolved.
- if the complaint is considered valid and the needed compensation/action is approved by IPIG, proceed for the delivery or compensation or for the execution of the redress action.
- when prompted by the LPC that a complainant with an unsolved grievance wants to lodge the complaint at a higher appeal level inform IPIG/MoTC and proceed with the organization of the central level appeal meeting.

#### **Representatives of the APs**

209. Two representatives of the APs from the affected community will participate in all GRG meetings and will:

- participate to all grievance redress meeting;
- provide relevant information related to the submitted complaints;
- provide other GRG members as relevant with a position note to be reflected in the final meeting report.

### **Ombudsman**

210. Once notified of a complaint and a summoned by the LPC to a grievance meeting is submitted the Ombudsman will:

- monitor complaint handling process and ensure that decisions made by the GRP are equitable and objective;
- provide independent opinions and recommendations related to the decision made on the case by the GRP team;
- advise the complainant(s) on their rights and entitlements, as necessary ;
- participate to all GRG meetings and site visits;
- participate in eventual assessment/valuation in the field;
- prepare a position memo at the end of the meeting(s) and forward it to LPC/chairperson of the GRG.

### **GRG Chairperson / Head of IPIG of MoTC**

211. Once notified that a complainant has lodged an appeal case at central level, the GRG chairperson will:

- contact the complainant(s) and draft a note with his/her understanding of the complaint;
- trigger the GRG members through a letter of invitation;
- chair the GRG meetings and ensure that minutes of the meeting are shared with all relevant parties;
- review the content of each response prepared after deliberations to ensure accuracy as well as consistency of answers provided to the complainants;
- ensure the administrative and organizational support for GRG members to work;
- support the decision made by the GRG and ensure that the follow-up actions are taken.

### **IPIG Project Coordinator**

212. Once notified that a complainant has lodged an appeal case at central level project coordinator will:

- contact the complainant(s) and draft a note with his/her understanding of the complaint;
- participate to the appeal meeting, provide opinions and analysis, take minutes of the discussions;
- if needed summon again assessment/valuation specialists and accompany them in the field;
- request the chairperson to organize meetings, as necessary;
- maintain communication between GRG and the complainants.

## Representatives of IPIG Safeguards Unit

213. Once notified that a complainant has lodged at central level, the representatives of IPIG safeguard and technical unit will:

- prepare the chronology of events to understand sequence of developments prompting the complaint;
- provide environmental and resettlement opinion on impacts claimed by the claimant
- request the chairperson to organize meetings, as necessary;
- maintain communication between GRG and the complainants.

## Technical Experts

214. Once summoned to provide expert advice for the assessment or valuation of an impact claimed by a complainant the relevant technical expert will carry out the needed investigations and prepare a report to be handed to the complainant and the other members of the GRG. The tasks will include:

- provision of relevant technical opinion for the case reviewed;
- carry out the needed investigations relevant to their expertise;
- provide recommendation when the legal opinion from the relevant state agencies is necessary.

## D. Grievance Resolution Process

215. The LPC of GRGs will be regularly available and accessible for APs to address concerns and grievances. He will assist the aggrieved APs in formally lodging their claims to the GRG. The complaints and grievances from the APs will be addressed through the process described below.

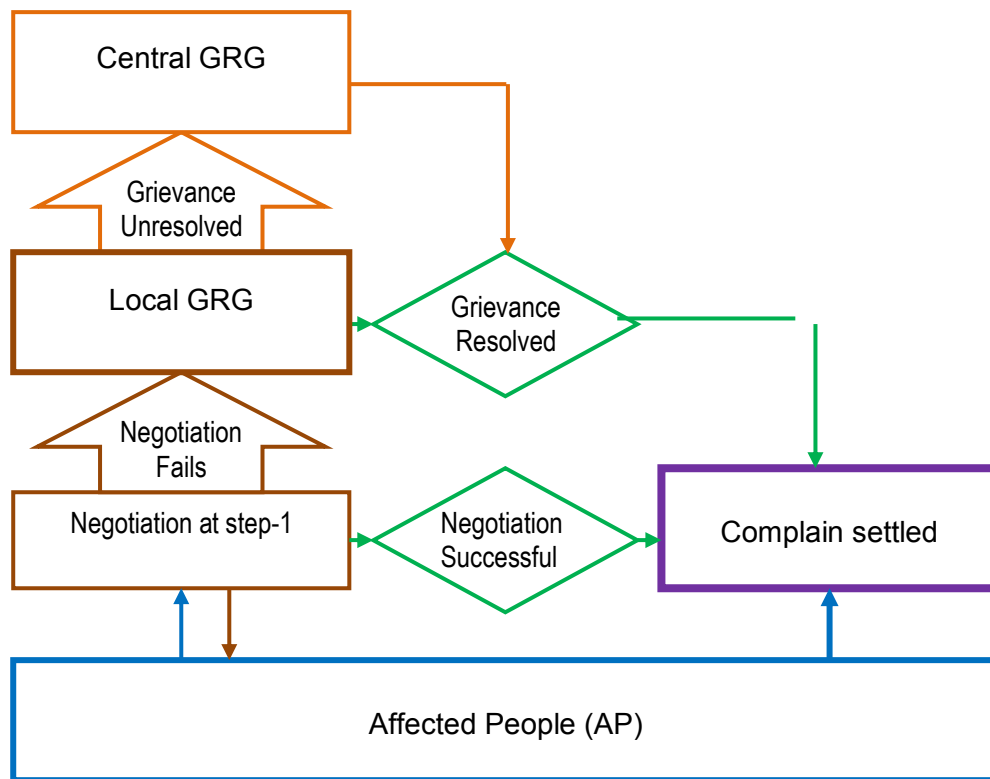
**Tab. 23 Grievance Resolution Process**

Steps	Action level	Process
Step 1	Negotiation	At initial stage, the LPC will give hearing to the aggrieved person and try to give acceptable solutions. If any aggrieved AP is not satisfied with the solutions, then the aggrieved AP will lodge grievances in written to the concerned local GRG within 7 days.
Step 2	GRG Resolution	After receiving written complaints of AP the LPC will review and prepare a Case File for GRG hearing and resolution. A formal hearing will be held with the GRG at a date fixed by the LPC in consultation and the aggrieved APs. On the date of hearing, the aggrieved AP will appear before the GRG at the office of concerned Ayil-Okmotu and produce proof in support of his/her claim. The LPC will note down the statements of the complainant and document all proof. The decisions from majority of the members will be considered final from the GRG and will be issued by the LPC and signed by other members of the GRG. The case record will be updated and the decision will be communicated to the complainant AP by the LPC within 15 days of submission. If any aggrieved AP is not satisfied with the solutions, then the LPC will lodge grievances in written to the central GRG at MoTC with conclusion and supporting documents prepared at local

		level.
Step 3	Resolution of Central GRG	After receiving written complaints of AP the GRG Chairperson of the central GRG will review and prepare a Case File for GRG hearing and resolution. A formal hearing will be held with the GRG at a date fixed by the GRG Chairperson and the aggrieved APs. GRG members will contact the complainant and visit his village. The IPIG Project Coordinator will note down the statements of the complainant and document all proof. The decisions from majority of the members will be considered final from the GRG and will be issued by the GRG Chairperson and signed by other members of the GRG. The case record will be updated and the decision will be communicated to the complainant AP by the IPIG Project Coordinator within 15 days of submission.

216. If the grievance redress system fails to satisfy the aggrieved APs, then they can apply to the appropriate court at their own cost for desired remedy at any time and stage. The APs have access to ADB Accountability mechanism at any stage after their concerns have been registered with the GRM log.

217. The grievance redress process is shown in the flowchart below.



**Fig. 7: Grievance redress process**

**E. GRG Records and Documentation**

218. IPIG of MoTC will maintain record of all complaints for regular monitoring of grievances and results of services performed by the GRGs, and for periodic review of ADB.

## X. CONCLUSION

219. Based on the IEE it is right to say that no major negative environmental impacts are likely to occur due to the construction activities and normal operations after the proposed rehabilitation. Recommendations have been made in this document to mitigate and compensate the identified expected negative impacts.
220. The Bishkek – Osh road project will rehabilitate an important part of the transport corridor across the Kyrgyz Republic. It will improve the country's competitiveness by improving the central transport corridor. Overall the project has significant advantages to the local people and companies operating in the country by providing better access to national and regional markets.
221. The better condition of the road will decrease costs originating from wear out of vehicles utilizing it. Road safety measures are also improved by providing new traffic signs, safety railings, etc. for the road.
222. This IEE report includes an Environmental Management Plan and a Monitoring Plan which were prepared as required by ADB. The results of these documents show that the potential environmental impacts of the proposed road rehabilitation are likely to occur due to construction activities and much of these impacts are temporary in nature. Implementation of appropriate mitigation measures during the design, construction, and operation phases will minimize the negative impacts of the project to acceptable levels.
223. In conclusion, the Project will have certain degree of temporary negative impacts, but it will also contribute to improving socioeconomic conditions along the project road. The negative impacts will be carefully monitored and adequately mitigated or compensated. Therefore, the completion of this IEE fully meets the ADB and government standards and no further environmental study is required for this project.

**Minutes of the Public Consultation Meeting  
under the CAREC Corridor 3 (Bishkek-Osh Road) Improvement Project, Phase 4  
Road Sections: Bishkek-Kara-Balta and Madaniyat-Djalal-Abad**

**Date:** June 10, 2013  
**Place of meeting:** Belovodskoye town, Moscovskiy rayon, Chuiskaya oblast, Conference-hall of Moscovskiy Rayon Administration  
**Meeting started:** 10.20  
**Meeting ended:** 11.45

**Presented:**

**IPIG/MOTC**

Asylbek Abdygulov                      Safeguard Specialist

**CONSULTANT «KOCKS CONSULT GMBH»**

Vasiliy Chernyh                      Deputy Team Leader

Nurul Hoque                          Sociologist

Erik Shukurov                        Ecologist

**LOCAL COMMUNITY (List is attached).**

**Agenda:** Presentation on Bishkek-Osh Road Rehabilitation Project, Section Bishkek-Kara-Balta

V. Chernyh made a presentation on Bishkek-Osh Road Rehabilitation Project, road section Bishkek-Kara-Balta to the local community (residents of Belovodskoye town). The presentation covered the following issues: 1) who is going to finance the project implementation, 2) who will implement the project, 3) ADB policy, 4) economical and social benefits of the project 5) environmental impacts' mitigation measures. Also, people were explained about the Grievance Redress Mechanism to be applied towards APs and others having any relation to the project implementation.

Upon completion of the presentation made by V. Chernyh, local residents asked a few questions. The focus was on how road safety measures would be implemented.

**Question:** How long the road construction will last?

**V. Chernyh.** Total project implementation period is approximately three years. Besides the construction works will start simultaneously in several sections.

**Question:** What will be the amount of compensation?

**Asylbek:** The compensation size will be determined additionally during the resettlement commission work, while preparing a detailed design.

**Question:** What is the forecasted traffic flow increase?

**V. Chernyh.** Estimated increase of road flow capacity is 4% per year over the next 20 years.

**Question:** What about construction of a by-pass road?

**V. Chernyh.** This option was discussed. Construction of a new road is double expensive than rehabilitation of old road pavement. Besides there is a moratorium on seizure and transformation of the agricultural land.

**Question:** Will be the subways, drainage structures, auxiliary roads rehabilitated/constructed to relieve the main road?

**V. Chernyh** explained that the subways would be rehabilitated: extended, strengthened, furnished. After the rehabilitation they would be maintained by local governments. Also the project includes construction of sidewalks, channels and drainage chutes. No additional auxiliary roads.

**Question:** How will the issue on cut plantations be solved?

**Asylbek:** First the owners of the trees to be cut will be identified. Upon implementation of the project all cut trees will be rehabilitated/compensated as 1:10. The contractor will be responsible for plantation and watering the trees during a year upon completion of construction works with following handing them over to RMD or local authority. Only local and drought-resistant species of trees and bushes would be planted.

**Question:** What is the width of the designed road? What about the communication lines?

**V. Chernyh.** Designed width of the roadway including shoulders is up to 29 meters. Total width within the Right of Way is 50 meters. During the road construction works the culverts which are in bad conditions will be replaced. After replacement, the old ones will be handed over to local authorities. All power lines will be replaced with new ones – new posts would be erected as well as new lines. Only after complete replacement and reconnection of power lines the old ones will be demolished.

**Question:** What is the total cost of the project?

**V. Chernyh.** Total cost of the project is appr. \$ 209 mln.

Then Abdygulov Asylbek explained that there would be the Grievance Redress Mechanism to be implemented within the frameworks of the Project. This mechanism would facilitate and speed up the feedback with the public. He also informed on measures to be taken to reduce the environmental impacts. To enhance awareness among the people it is planned to distribute informative brochures containing information on social, economical and engineering aspects of the Bishkek-Osh road rehabilitation project.

At the end of the meeting V. Chernyh thanked the participants for taking part in the public consultation meeting and expressed hope for successful cooperation in the course of the project implementation.



**Minutes of the Public Consultation Meeting  
under the CAREC Corridor 3 (Bishkek-Osh Road) Improvement Project, Phase 4  
Road Sections: Bishkek-Kara-Balta and Madaniyat-Djalal-Abad**

**Date:** June 11, 2013  
**Place of meeting:** Petropavlovka village, Dzhayilskiy region, Chuiskaya oblast, Conference-hall of Petropavlovskiy local administration.  
**Meeting started:** 14.30  
**Meeting ended:** 16.10

**Presented:**

**IPIG/MOTC**

Asylbek Abdygulov                      Safeguard Specialist

**CONSULTANT «KOCKS CONSULT GMBH»**

Vasiliy Chernyh                      Deputy Team Leader

Nurul Hoque                          Sociologist

Erik Shukurov                      Ecologist

**LOCAL COMMUNITY (List is attached).**

**Agenda:** Presentation on Bishkek-Osh Road Rehabilitation Project, Section Bishkek-Kara-Balta

V. Chernyh made a presentation on Bishkek-Osh Road Rehabilitation Project, road section Bishkek-Kara-Balta to the local community (residents of Petropavlovka village). The presentation covered the following issues: 1) who is going to finance the project implementation, 2) who will implement the project, 3) ADB policy, 4) economical and social benefits of the project 5) environmental impacts' mitigation measures. Also, people were explained about the Grievance Redress Mechanism to be applied towards APs and others having any relation to the project implementation.

Upon completion of the presentation made by V. Chernyh, local residents asked a few questions. The focus was on how road safety measures would be implemented?

**Question:** How long the road construction will last?

**V. Chernyh.** Total project implementation period is approximately three years. Besides the construction works will start simultaneously in several sections.

**Question:** Who will be the contractor?

**V. Chernyh:** The contractor will be determined based on results of the tender. It could be both local and foreign company.

**Question:** : What will be the amount of compensation?

**Asylbek:** The compensation size will be determined additionally during the resettlement commission work, while preparing a detailed design.

**Question:** What about construction of a by-pass road?

**V. Chernyh.** This option was discussed. Construction of a new road is double expensive than rehabilitation of old road pavement. Besides there is a moratorium on seizure and transformation of the agricultural land.

**Question:** Will be the subways, drainage structures, auxiliary roads rehabilitated/constructed to relieve the main road?

**V. Chernyh** explained that the subways would be rehabilitated: extended, strengthened, furnished. After the rehabilitation they would be maintained by local governments. Also the project includes construction of sidewalks, channels and drainage chutes.

**Question:** How will the issue on cut plantations be solved?

**Asylbek:** First the owners of the trees to be cut will be identified. Upon implementation of the project all cut trees will be rehabilitated/compensated as 1:10. The contractor will be responsible for plantation and watering the trees during a year upon completion of construction works with following handing them over to RMD or local authority. Only local and drought-resistant species of trees and bushes would be planted.

**Question:** How will the construction works influence on the environment of Petropavlovka village? What about the current situation with maximum permissible concentration of harmful substances in vehicle emissions, noise and vibration? Is there is an excess?

**Asylbek:** Without doubt in the course of rehabilitation works the dust level will increase as well as other emissions since along with the usual traffic flow some heavy road construction equipment and heavy trucks will be engaged.

**E. Shukurov.** At present we have no any data on air quality, noise and vibration. In the nearest future certain measurements will be taken. The results of those measurements will be used as a basic reference environment data and will be compared with the results of the following measurements. The environment condition will be monitored within the settlements through which the road passes.

**Question:** What is the width of the designed road? What about the communication lines?

**V. Chernyh.** Designed width of the roadway including shoulders is up to 29 meters. Total width within

the Right of Way is 50 meters. During the road construction works the culverts which are in bad conditions will be replaced. After replacement, the old ones will be handed over to local authorities. All power lines will be replaced with new ones – new posts would be erected as well as new lines. Only after complete replacement and reconnection of power lines the old ones would be demolished.

**Question:** What is the total cost of the project?

**V. Chernyh.** Total cost of the project is appr. \$ 209 mln.

Then Abdygulov Assylbek explained that there would be the Grievance Redress Mechanism to be implemented within the frameworks of the Project. This mechanism would facilitate and speed up the feedback with the public. He also informed on measures to be taken to reduce the environmental impacts. To enhance awareness among the people it is planned to distribute informative brochures containing information on social, economical and engineering aspects of the Bishkek-Osh road rehabilitation project.

At the end of the meeting V. Chernyh thanked the participants for taking part in the public consultation meeting and expressed hope for successful cooperation in the course of the project implementation.



**Minutes of the Public Consultation Meeting  
under the CAREC Corridor 3 (Bishkek-Osh Road) Improvement Project, Phase 4  
Road Sections: Bishkek-Kara-Balta and Madaniyat-Djalal-Abad**

**Date:** June 10, 2013  
**Place of meeting:** Sokuluk village, Sokulukskiy rayon, Chuiskaya oblast, conference-hall of Sokuluk ayil okmotu  
**Meeting started:** 14.15  
**Meeting ended:** 15.40

**Presented:**

**IPIG/MOTC**

Asylbek Abdygulov                      Safeguard Specialist

**CONSULTANT «KOCKS CONSULT GMBH»**

Vasiliy Chernyh                      Deputy Team Leader

Nurul Hoque                          Sociologist

Erik Shukurov                        Ecologist

**LOCAL COMMUNITY (List is attached).**

**Agenda:** Presentation on Bishkek-Osh Road Rehabilitation Project, Section Bishkek-Kara-Balta

V. Chernyh made a presentation on Bishkek-Osh Road Rehabilitation Project, road section Bishkek-Kara-Balta to the local community (residents of Sokuluk). The presentation covered the following issues: 1) who is going to finance the project implementation, 2) who will implement the project, 3) ADB policy, 4) economical and social benefits of the project 5) environmental impacts' mitigation measures. Also, people were explained about the Grievance Redress Mechanism to be applied towards APs and others having any relation to the project implementation.

Upon completion of the presentation made by V. Chernyh, local residents asked a few questions. The focus was on how road safety measures would be implemented?

**Question:** Will the channel lines near the road in Shopokov street be destroyed or otherwise impacted?

**V. Chernyh** explained that all communication and channel lines will be either shifted or equipped by protective coats.

**Question:** Will be the subways rehabilitated?

**V. Chernyh** explained that the subways would be rehabilitated: extended, strengthened, furnished. After the rehabilitation they would be maintained by local governments.

**Question:** What will happen to the trade outlets occurred within the project implementation zone?

**V. Chernyh** explained that all kiosks built in a light construction will be temporary shifted from the construction side and returned back upon completion of the project. Capital structures most likely will be removed. Big trade complexes will be provided with access roads. Parking is not foreseen. Construction works will cause only temporary impact by hindering access to these complexes.

**Question:** How will the issue on cut plantations be solved?

**Assylbek:** First the owners of the trees to be cut will be identified. Upon implementation of the project all cut trees will be rehabilitated as 10:1. The contractor will be responsible for plantation and watering the trees during a year upon completion of construction works with following handing them over to RMD or local authority. Only local and drought-resistant species of trees and bushes would be planted.

**Question:** What is the width of the designed road? What about the communication lines?

**V. Chernyh.** Designed width of the roadway including shoulders is up to 29 meters. Total width within the Right of Way is 50 meters. During the road construction works the culverts which are in bad conditions will be replaced. After replacement, the old ones will be handed over to local authorities. All power lines will be replaced with new ones – new posts would be erected as well as new lines. Only after complete replacement and reconnection of power lines the old ones would be demolished.

**Question:** What about the traffic lights, street lighting? Will they be provided? How will the road pavement and adjacent territory look?

**V. Chernyh.** Traffic lights, street lighting are foreseen by the project. Also the project includes construction of sidewalks, channels and drainage ditches. Besides it is planned to pave with asphalt the junctions 30-50 meters long as well as access roads to the gates of households. The sidewalks will be equipped with ramps. The profile of the road will be raised; there will be reinforced concrete chutes on the shoulders as well as all required engineering measures will be taken to improve the safety of the roadway. Number of bus stops will be increased and re-equipped. All road construction works will be carried out in accordance with all established standards, the construction supervision consultant will monitor the whole construction process. The service life of the road is appr. 18 years.

**Question:** How will the old asphalt be utilized?

**V. Chernyh.** The old asphalt will be used in the following way: 50% for construction needs and 50% for the needs of local people (repair of feeder roads and others).

Then Abdygulov Assylbek explained that there would be the Grievance Redress Mechanism to be implemented within the frameworks of the Project. This mechanism would facilitate and speed up the feedback with the public. He also informed on measures to be taken to reduce the environmental impacts. To enhance awareness among the people it is planned to distribute informative brochures containing information on social, economical and engineering aspects of the Bishkek-Osh road rehabilitation project.

At the end of the meeting V. Chernyh thanked the participants for taking part in the public consultation meeting and expressed hope for successful cooperation in the course of the project implementation.

Annex: Public Consultational Meeting



**Minutes of the Public Consultation Meeting  
under the CAREC Corridor 3 (Bishkek-Osh Road) Improvement Project, Phase 4  
Road Sections: Bishkek-Kara-Balta and Madaniyat-Djalal-Abad**

**Date:** June 10, 2013  
**Place of meeting:** Voенno-Antonovka village, Sokulukskiy rayon, Chuiskaya oblast,  
Conference-hall of Voенno-Antonovka ayil okmotu  
**Meeting started:** 9.00  
**Meeting ended:** 10.20

**Presented:**

**IPIG/MOTC**

Asylbek Abdygulov                      Safeguard Specialist

**CONSULTANT «KOCKS CONSULT GMBH»**

Vasiliy Chernyh                      Deputy Team Leader

Nurul Hoque                          Sociologist

Erik Shukurov                        Ecologist

**LOCAL COMMUNITY (List is attached).**

**Agenda:** Presentation on Bishkek-Osh Road Rehabilitation Project, Section Bishkek-Kara-Balta

V. Chernyh made a presentation on Bishkek-Osh Road Rehabilitation Project, road section Bishkek-Kara-Balta to the local community (residents of Voенno-Antonovka village). The presentation covered the following issues: 1) who is going to finance the project implementation, 2) who will implement the project, 3) ADB policy, 4) economical and social benefits of the project 5) environmental impacts' mitigation measures. Also, people were explained about the Grievance Redress Mechanism to be applied towards APs and others having any relation to the project implementation.

Upon completion of the presentation made by V. Chernyh, local residents asked a few questions. The focus was on how road safety measures would be implemented?

**Question:** Will be a bend provided to a knitting factory "VOSST"?

**V. Chernyh** explained on furnishing of all junctions with gaps in a median strip with road marking, installation of traffic lights.

**Question:** What will happen to the trade outlets occurred within the project implementation zone?

**V. Chernyh** explained that all kiosks built in a light construction will be temporary shifted from the construction side and returned back upon completion of the project. Capital structures most likely will be removed.

**Question:** How will the issue on cut plantations be solved?

**Asylbek:** First the owners of the trees to be cut will be identified. Upon implementation of the project all cut trees will be rehabilitated as 10:1. The contractor will be responsible for plantation and watering the trees during a year upon completion of construction works with following handing them over to RMD or local authority.

**Question:** What is the width of the designed road? What about the communication lines?

**V. Chernyh.** Designed width of the roadway including shoulders is up to 29 meters. Total width within the Right of Way is 50 meters. During the road construction works the culverts which are in bad conditions will be replaced. After replacement, the old ones will be handed over to local authorities.

**Question:** What about the traffic lights, street lighting? Will they be provided? What will be the structure of the road pavement?

**V. Chernyh.** Traffic lights, street lighting are foreseen by the project. Also the project includes construction of sidewalks, channels and drainage ditches. Besides it is planned to pave with asphalt the junctions 30-50 meters long as well as access roads to the gates of households. The sidewalks will be equipped with ramps. The profile of the road will be raised; there will be reinforced concrete chutes on the shoulders as well as all required engineering measures will be taken to improve the safety of the roadway. All road construction works will be carried out in accordance with all established standards, the construction supervision consultant will monitor the whole construction process. The service life of the road is 18 years.

Then Abdygulov Assylbek explained that there would be the Grievance Redress Mechanism to be implemented within the frameworks of the Project. This mechanism would facilitate and speed up the feedback with the public. He also informed on measures to be taken to reduce the environmental impacts.

At the end of the meeting V. Chernyh thanked the participants for taking part in the public consultation meeting and expressed hope for successful cooperation in the course of the project implementation.

