Initial Environmental Examination

Project Number: TA 8887-KGZ
November 2016

KGZ: CAREC Corridors 1 and 3 Connector Road Project (Section "Epkin [Km 89] to Bashkugandy [formerly Dyikan] [Km 159]")

This Initial Environment Examination in Detailed Design Stage was prepared by Japan Overseas Consultants/ DI"KYRGYZDORTRANSPROEKT for the Ministry of Transport and Roads of Kyrgyz Republic for the Asian Development Bank, by updating the IEE Report in the Feasibility Stage prepared by Kocks Consult GmbH / Finnish Overseas Consultants Ltd. / CAC Consulting

ABBREVIATIONS

ADB	-	Asian Development Bank
ADT	-	Average Daily Traffic
AIDS	-	Acquired Immune Deficiency Syndrome
AP	-	Affected People
BoQ	-	Bill of Quantities
CAREC	-	Central Asia Regional Economic Cooperation
CEWP		Construction Environmental Work Plan
CITES	-	Convention on International Trade in Endangered Species
CO	-	Carbon Monoxide
CSC	-	Construction Supervision Consultant
CW	-	Civil Works
dBA	-	A-weighted decibels
DO	-	Dissolved oxygen
EA	-	Executing Agency
EIA	-	Environmental Impact Assessment
EIP	-	Environmental Impact Permit
EMoP	-	Environmental Monitoring Plan
EMP	-	Environmental Management Plan
FCM	-	Family Medicine Centres
GRM	-	Grievance Redress Mechanism
h, hr	-	Hour
Ha	-	Hectare
HIV	-	Human Immunodeficiency Virus
IA	-	Implementing Agency
IEE	-	Initial Environmental Examination
IES	-	International Environmental Specialist
IPIG	-	Investment Projects Implementation Group
KDTP	-	Kyrgyzdortransproekt
Kg	-	Kilogram
Km	-	Kilometer
Kpa	-	Kilopascal
LAR	-	Land Acquisition and Resettlement
LARP	-	Land Acquisition Resettlement Plan
LHS	-	Left Hand Side
Ls	-	Lump Sum
M2	-	Square Meter
M3	-	Cubic Meter
Max.	-	Maximum
MESD	-	Ministry of Economic and Sustainable Department
Min.	-	Minimum
MOF	-	Ministry of Finance
MOTR	-	Ministry of Transport and Road of the Kyrgyz Republic
MoCIT		Ministry of Culture, Information and Tourism of the Kyrgyz

		Republic
MPC	-	Maximum Permissible Concentrations
NES	-	National Environmental Specialist
NGO	-	Non-Governmental Organization
No.	-	Number
NO2	-	Nitrogen Dioxide
PAM	-	Project Administration Manual
PAP	-	Project-Affected Person
PBM	-	Performance-based maintenance
PER	-	Public Environmental Review
PPMS	-	Project Performance Management System
PPTA	-	Project Preparatory Technical Assistance
RAP	-	Resettlement Action Plan
RHS	-	Right Hand Side
ROW	-	Right-of-Way
RP	-	Resettlement Plan
SA	-	Social Assessment
SAEPF	-	State Agency on Environment Protection and Forestry
SER	-	State Environmental Review
SO2	-	Sulfur Dioxide
SPS	-	Safeguard Policy Statement
SSEMP	-	Site Specific Environmental Management Plan
TA	-	Technical Assistance
TS	-	Technical Survey
TMP	-	Traffic Management Plan
TOR	-	Terms of Reference
TPH	-	Petroleum Hydrocarbon
TSP	-	Total Suspended Particulates
UNFCC	-	United Nations Framework Convention on Climate Change
WHSP	-	Worker’s Health and Safety Plan

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A. Executive Summary

Introduction

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 rehabilitation of CAREC Corridors 1 and 3 Connector Road. The main outcome of the PPTA is to prepare a feasibility study suitable for donors financing. The Section «Epkin (Km 89) to Bashkugandy (km 159)" will be financed by ADB.

2. The proposed Project will improve the following socioeconomic indicators of the regions of the Kyrgyz Republic:

(i) Reduce the cost of passenger and cargo transportation between southern and Issyk-Kul and Naryn regions by providing direct access.
(ii) Reduce transport costs due to route cutting and better road conditions.
(iii) Increase in local and international transportation and movement.
(iv) Origination of additional income-generating opportunities for local residents
(v) Creation of new jobs
(vi) Good state of vehicles/Reduction of operating costs

3. This is the Initial Environment Examination of Detailed Design Stage Version report for the project in accordance with the legislation of the Kyrgyz Republic and has been prepared by upgrading the previous IEE Report in Feasibility Stage Version, wherever possible, as was initially prepared by KOCKS and approved by ADB. As a result of upgrading, same conclusion as previous IEE was obtained as "With the expected construction scope, no significant adverse or irreversible environmental impacts had been noted in the environmental assessment process".

4. According to the categorization of ADB Safeguard Policy Statement, the project belongs to category "B" and doesn't require full Environmental Impact Assessment (EIA). As a part of the ADB Policy, the project requires Initial Environmental Examination (IEE) only.

5. The purpose of this IEE is to finalize, as Detailed Design Stage, the IEE Report already presented at Feasibility Design Stage and to obtain the environmental license from SAEPF. This IEE re-assesses potential environmental, health, safety and social impacts of the proposed road project, and proposes mitigation measures, more deeply than previous IEE wherever possible. This IEE document includes an updated Environmental Management Plan (EMP) based on the additionally identified potential impacts, their characteristics, magnitude, distribution, and duration, sensitive receptors and affected groups with corresponding mitigation measures designed to minimize, reduce and mitigate (or compensate the affected parties), to be implemented for the entire project cycle.

6. This IEE study for Section "Epkin (Km 89) to Bashkugandy (km 159)" is being conducted based on review of previous IEE report, additionally covered by site reconnaissance, environmental monitoring (noise) and numerical analysis. The first public consultation as Feasibility Study Stage was done and was attended by residents of the communities mentioned as well as those from surrounding villages.

Policy, Legal, and Administrative Framework

7. The IEE study was in conformance with the national legal framework of Kyrgyzstan consisting of the important laws in environmental protection, water protection, cultural heritage,

public health, and other national environmental legislations. In addition, International Treaties that Kyrgyzstan was a signatory were also considered as part of the overall framework. The environmental assessment in Kyrgyz Republic is founded on two subsystems: (i) OVOS (the Russian acronym for "Assessment of Environmental Impacts"), and (ii) Ecological Expertise (State Environmental Review, SER). The resulting IEE is then presented for public consultations, after which revisions are done according to the public's feedback. Subsequently, the OVOS report, Statement of Environmental Consequences, and other supporting documentations are submitted for the State Environmental Review (SER). After which the project may be approved, rejected or send for re-examination.

8. Under ADB approval requirements, a set of specific safeguard requirements are required to be met by the Borrowing Country in addressing environmental and social impacts and risks. The project would undergo Screening and Categorization, formulation of Environmental Management Plan and Public Disclosure. Public Consultations for Category B would be required so that views of affected groups are taken into account in the design of the Project and within the mitigation measures proposed.

Description of the Project

9. The project road Section Epkin (Km 89) to Bashkugandy (km 159) is a 70-km east to west highway. Generally, this Section follows the existing alignment up to Bashkugandy (km 159). The entire of this section is within Naryn Oblast and it traverses small western part of Kochkor District (Kochkor, as the capital); while the most part is in Jumgal District (Chaek as the capital).

10. The details of the proposed road Section project are:

(i) Rehabilitate and pave the project road to Technical Category II from Epkin (Km 89) to Bashkugandy (km 159) according to Kyrgyzstan National Standard with Geometrical and Structural Requirements with design speed of 120 km/hour in rolling terrain (60 km/hour in mountainous terrain).
(ii) Rehabilitation, repair and/or replacement of bridges and culverts.
(iii) Construction of side drains and other drainage structures.
(iv) Provision of retaining walls and river protection measures, where necessary.
(v) Provision of adequate road signing and marking.
(vi) Provision of safety barriers.

11. The road is to be designed according to Kyrgyz geometric design standard, and accordingly, it shall be sufficient to carry the traffic loading efficiently within its projected service life. Effectively, these will be a two-lane road consisting of a carriageway width (sum of the width of lanes) and the width of the shoulders. The design elements for the cross section of the project road are as follows:

(i)	Number of lanes:	2
(ii)	Lane width:	3.5–3.75 m
(iii)	Carriageway width:	7.00–7.50 m
(iv)	Width of shoulder:	3.25–3.75 m (of which 0.50–0.75 m is paved)
(v)	Total road width:	15.00 m

Description of the Environment (Baseline Data)

12. The road 70 km from Epkin (km 89) to Bashkugandy (km 159) runs over Kochkor valley through Kyzart mountain pass (2664m) to Jumgal depression. The Section proceeds westward to Bashkugandy village passing through a number of settlements interspersed by agricultural fields with a 2-line configuration of carriageway.

13. These western parts of Kochkor District are vast tracts of agricultural lands devoted to farming and animal stock-raising. The road climbs to around 2,600 m which seem to be the highest point at Kyzart Pass after which it descends to Jumgal District. The high portion appears to be the boundary between Kochkor and Jumgal Districts, and also the delineation of the watersheds for the Chui and Jumgal Rivers. This high point on the road seems to be the saddle point between mountain ranges the run parallel east to west of Naryn Oblast. The terrain is characterized as undulating and mountainous and covered with grasses suitable for grazing.

Environmental Impacts and Mitigation Measures

14. It is assumed that the impact of the project will be limited in intensity and in spatial relation. Most of the anticipated environmental impacts of the proposed road project are likely to be resulting directly from construction activities and certain impacts occur in operation stage as well. These impacts in operation stage 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 special attention should be paid for the sections, located alongside the Project road and where sensitive receptors are located such as schools, hospitals mosques and others. Identified impacts include:

(i) emission of pollutants to air;
(ii) noise impacts and vibration;
(iii) impacts on surface/groundwater courses and rivers;
(iv) impacts from aggregate sourcing at borrow sites;
(v) impacts on soil and vegetation, inclusive tree plantations alongside the Project road due to site clearance activities;
(vi) impacts from bridge rehabilitation;
(vii) impacts from asphalt plant and aggregate crushers;
(viii) impacts from contractor's working camps.

Besides, the impact was divided to the following groups: impacts during the design phase, construction phase, and operation phase impacts. Detailed impact description is presented in section “Environmental Impacts and Mitigation Measures” and in Environmental Management Plan.

15. The construction entails a number of activities which are expected to introduce impacts and disturbances to the general environment, especially during the construction period. Most of these impacts are confined within the right-of-way, construction sites, and facility sites.

Avoidance of impacts can be executed by proper planning/preparation during the Pre-engineering and design phase. The mitigation measures will consist of the following: (i) use of green measures for erosion; (ii) asymmetric widening to avoid maximum felling of trees; (iii) avoidance of encroachment to archeological and historical sites with strict instructions to workers; (iv) provision of road safety measures and traffic plan to avoid accidents and maintain access to people; (v) gaseous emissions will be minimized and controlled by proper and regular

maintenance of equipment; (vi) dust is controlled by regular water spraying on exposed areas; (vii) noise during construction is minimized at the vicinity of sensitive receptors by installing noise barrier of plastic sheet wall (as is effective to air pollution as well) only during embankment compaction, in addition to proper scheduling of works and provision of noise mufflers to trucks and equipment, As for during operation, reduce the driving speed of all vehicle equal to or under 40 km/h only when they pass residential/sensitive areas; (vii) surface water contamination is mitigated by avoiding petroleum spills and soil droppings in water and situating contaminating substances away from waterways and construction of settling ponds for clarifying water prior to discharge; (viii) material sources should be reinstated after usage; (ix) ensure usage and installation of safety measures at worksites and along the road; (x) strictly avoid possible habitat areas of biological organism and prohibit workers from harming indigenous local species. Among all, sensitive receptors for noise include:

(i) Jumgal village (km129+400) – near the school along the road, LHS;
(ii) Kuruchuk village (km144+000) – near the Azamat shop, RHS;
(iii) Tulgo Say village (km151+000) – near the shop of Kutman, LHS
(iv) Bashkugandy village (km 159+000) – near the school adjacent to the road, RHS

Analysis of Alternatives

16. Two alternatives were considered in this Initial Environmental Examination (IEE):
(i) Zero option - inaction / do nothing
(ii) The road reconstruction project

17. The “Zero option” alternative scenario will mean that the road stays “as is”, in which no rehabilitation works. Considering the mentioned reasons and along with those presented in the “Country and Regional Strategy” and “Locality Specific Rationale”, the benefits of rehabilitating and reconstructing the road generally outweigh the expectations of the “zero option” alternative. The second Alternative is considering the road reconstruction in the section Epkin (Km 89) 0to Bashkugandy (km 159).

18. The conclusion of alternative analysis is that,
- if zero option is implemented, the benefit will be less traffic density and few road accidents.
- The negative side is increased noise and vibration, lack of proper road pavement, negative social aspect, and impossibility to develop the region’s economy.
- Thus, the benefit of implementing project is much larger than that without project.

Consultation, Participation, and Information Disclosure

19. In accordance with ADB’s Public Communications Policy (2011) and SPS (2009), the first Public Consultation meeting for this section on the environmental aspects was undertaken on 18 March 2016 in the village hall in Bashkugandy. During the said public consultation the Consultant (Kocks Consult, GmbH), prepared PowerPoint presentation regarding the technical features of the project and explained the potential environmental and social impacts with corresponding mitigation measures. This event was organized by IPIG with the assistance of PPTA consultants. At this instance, the participants were able to express what they thought about the project and were given a chance to ask clarificatory questions during the open forum. Forms were provided to the people for them to write in their own comments which incorporated in the IEE and serve as recommendations in the design phase.

20. The IEE also was disclosed to a wider audience via the ADB website. During the project

implementation, periodic environmental monitoring reports shall be submitted by IPIG on behalf of MOTR and correspondingly also be uploaded in the ADB website and in KGZ on MOTR website.

Grievance Redress Mechanism

21. The Grievance Redress Mechanism (GRM) is a process through which the affected people need a trusted way to voice and resolve concerns about the project and the project also finds an effective way to address affected people's concerns. The GRM will cover issues related to social, environmental and other safeguard issues under ADB safeguard covenants and Kyrgyz Law.

22. With two stage appeals – the Local (village) Level and Central Level, along with greater participation of the local people, resolution of complaints will be better ensured. ADB itself has additional mechanism in which a complainant can be appealed through the ADB Accountability Mechanism which is always accessible to the APs.

Environmental Management Plan

23. The Environmental Management Plan (EMP) for the project road, consisting of impact mitigation and monitoring plan, has been prepared as part of this IEE. A program of monitoring, the Environmental Monitoring Plan (EMoP), is also updated herein to ensure that all concerned agencies take the specified action to provide the required mitigation, to assess the level of project impacts on environmental quality and to determine whether any additional measures may be necessary.

24. This EMP will be part of the contract documents consisting of specified measures covering most of the possible issues that can occur will enable the avoidance, reduction, and mitigation of adverse impacts in the project cycle. Supplementary Plans will also be drawn up by the Contractor for specific situations to ensure a focused action on any problem that might arise.

25. Operational framework of the EMP involves the national agencies (IPIG-MOTR & SAEPF), ADB Safeguard Specialists, Construction Supervision Consultant, Contractor, with the local governments and recognizing roles of NGO's and people's organization at the project site.

26. The cost for implementing EMP will be financed by the loan, specifically the costs of mitigation measures will be included in the construction contracts, and the cost for environmental monitoring will be included in the consulting service of the CSC. Mitigation measures and a monitoring plan have been developed and incorporated into the EMP. Under the guidance of CSC, the contractor will have to submit site-specific Environmental Management Plans (SSEMP) for the following prior to commencing operations: (i) SSEMP in the sensitive sites such as main residential areas, cultural& historical sites including cemeteries, riverbanks or other waterways; (ii) layout of the work camp with sewage management and waste management plan; (iii) sitting and description asphalt and crashing plants, equipment maintenance and storage facilities; (iv) spoil soil management plan; (v) borrow site management including restoration; and (vi) method statement for bridge reconstruction works. The SSEMPs shall be endorsed by the construction supervision consultant (CSC) before submission to IPIG for approval.

27. IPIG will promptly inform ADB of the occurrence of any risks or impacts, with detailed description of the event and proposed corrective action plan if any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Project that were not considered in the IEE. IPIG will report any actual or potential breach of compliance with the measures and requirements set forth in the EMP promptly after becoming

aware of the breach.

Monitoring and reporting. During construction, monitoring shall be done by CSC. Based on this monitoring results, CSC will submit quarterly project progress report reflecting environmental safeguard compliance. CSC will assist IPIG in compiling and submitting semiannual monitoring reports (EMR) during project construction within one month after each reporting period. EMRs will be disclosed at ADB website and to local authorities.

Conclusions and Recommendations

28. The IEE/EMP-EMoP, as part of the contract documents shall be adhered to by the Contractor.

29. The proposed Environmental Management and Monitoring Plans in this IEE will ensure that the good quality for surface water, air and noise in the general area is maintained, primarily during the construction phase.

30. Adequate public consultations were done in introducing the project as well as presentation of environmental and community impacts and the stakeholder concerns were incorporated into the IEE. The IEE will be disclosed to the public and can be viewed on ADB websites after implementation of 2nd Public Consultation in this DD Stage.

31. As per the Kyrgyz Law, the proposed project will require permits from the government regulatory agencies: The Environmental Permit will be processed by the IPIG with the State Agency on Environment Protection and Forestry after the IEE is cleared with the ADB.

B. Policy, Legal, and Administrative Framework

1. Introduction

32. The Government of the Kyrgyz Republic (the government) has requested for a project preparatory technical assistance (PPTA) from the Asian Development Bank (ADB) to identify, formulate, and prepare an ensuing loan and/or grant for the CAREC Corridors 1 and 3 Connector Road. The main output of the PPTA is a feasibility study suitable for donors financing. The study will cover five (5) sections:

a. Balykchi (Km 0) to kilometer-post 43 (Km 43), approximately 43 kilometers (km);
b. Kochkor (Km 64) to Epkin (Km 89), approximately 25 km;
c. Epkin (Km 89) to Bashkugandy (km 159), approximately 70 km;
d. Bashkugandy (km 159) to Kyzyl-Zhyldyz (km 183), approximately 24km, where a Bypass Road is being envisioned to avoid the village of Chaek and part of Kyzyl-Zyldyz; and
e. Aral (Km 195) to Too-Ashuu (km 286), approximately 91 km.

The Section Epkin (Km 89) to Bashkugandy (km 159) will be financed by ADB.

33. The project scope also includes soft components to tackle sector-wide issues. Agreement needs to be reached with the government on the exact details, including: (i) improve efficiency of road asset management in the Kyrgyz Republic, (ii) support the government with institutional reforms in transport sector, (iii) introduce performance based maintenance contracts, and (iv) improve road safety in the Kyrgyz Republic.

The Investment Project Implementation Group (IPIG) within the Ministry Transport and

Communication (MOTR) shall be the Executing Agency (EA) for this project during the construction stage. As initial part of the possible funding assistance, the ADB has engaged Kocks Consult GmbH, Germany, to prepare a Feasibility Study and Preliminary Design for the entire project. The consultancy scope also includes an Initial Environmental Examination (IEE); and a social and poverty analysis and impact assessments, in accordance with ADB's Safeguard Policy Statement (SPS) 2009. Then, Japan Overseas Consultants was hired to upgrade this previous IEE to be finalized.

34. With reference to the Contract Agreement for Consultancy Services for the engagement, one of the main tasks of the Consultant is to update/upgrade the previous IEE report in Feasibility Stage to the IEE Report in the Detailed Design Stage Report for the project in accordance with the requirements of environmental legislations of the Government of Kyrgyzstan in addition to the ADB's Safeguard Policy Statement (SPS) 2009. Such environmental safeguard requirements specify that the borrowers/clients are to undertake an environmental assessment process which entails assessing impacts, planning and managing impact mitigations, preparing environmental assessment reports, disclosing information and undertaking consultation establishing a grievance mechanism, and monitoring and reporting. The IEE document had included such articular environmental safeguard requirements pertaining to biodiversity conservation and sustainable management of natural resources, pollution prevention and abatement, occupational and community health and safety, and conservation of physical cultural resources. This IEE covers same scope as above but some of the impact analyses were further upgraded, carrying out detailed prediction of noise, air pollutions and groundwater contamination quantitatively.

35. As well as previously, this IEE document also includes an Environmental Management Plan (EMP) that is the updated version of EMPs as had been presented previously, that covers, based on the identified potential impacts, their characteristics, magnitude, distribution, and duration, sensitive receptors and affected groups. This updated EMP attempts, more quantitatively than previous EMP, to address the potential impacts and risks identified by the environmental assessment with the corresponding mitigation measures designed to minimize, reduce and mitigate (or compensate the affected parties) and to be implemented for the entire project cycle.

2. Extent of IEE Study

36. This IEE Report is for the Section «Epkin (Km 89) to Bashkugandy (km 159)", which has a distance of around 70 km. This road section shall be rehabilitated into Category II road. This Report has been prepared basically based on the previous IEE Report which was approved by ADB on July 2016. The purpose of this stage is to review and upgrade the previous IEE Report with more updated and quantitative environmental information additionally obtained/revealed, based on updated construction information such as detailed configuration of infrastructures on/along the road (culverts and power lines), more detail of earth work proposed, potential borrow pits, additional field monitoring and prediction of behavior of noise/pollutions in air and groundwater by sophisticated numerical method. Other environmental issues were also reviewed and confirmed such as fauna and flora, climate change, health, safety and social issues. Based on all the impacts additionally identified/reviewed, considering with the construction scope, it is expected that few impacts, if any, are irreversible, and in most cases mitigation measures can be designed to avoid or minimize them, as is same conclusion of previous IEE report.

37. The first Public Consultations meeting on the environmental aspects for Epkin (km 89) to Bashkugandy (km 159), in accordance with Kyrgyz legislation on public access to the information and ADB's Public Communications Policy (2011) and SPS (2009), was undertaken on 18 March

2016 in Bashkugandy Village Administration Office. This was organized by the IPIG-MOTR through official communication to the local leaders inviting stakeholders in the surrounding villages.

3. Environmental protection legislation of Kyrgyz Republic

38. Environmental impact of the Epkin (km 89) to Bashkugandy (km 159) Road Rehabilitation Project is regulated by a number of environmental legislative acts of the Kyrgyz Republic. The Relevant elements of the environmental legislation of the Kyrgyz Republic are shown in Table below.

Table 1: National Environmental Legislations

#	Legislation	Number & Year of adoption	Purpose/content
Main laws on environmental protection			
1	The Constitution of the Kyrgyz Republic	2010	Land, its mineral resources, airspace, waters, forests, flora and fauna and other natural resources are used, but at the same time are under protection. Everyone is obliged to take care of the environment, flora and fauna of the country.
2	The Environmental Safety Concept of KR	No.506 dtd. 23.11.2007	It establishes the basic principles of environmental policy and determines global, national and local environmental issues; priorities in the field of environmental protection at the national level as well as tools to ensure environmental safety.
3	National Sustainable Development Strategy of the Kyrgyz Republic for 2013-2017	No.11 dtd. 21.01.2013	Provides a conceptual sustainable development framework aimed to satisfy the needs of current generations and not to endanger at the same time the needs of future generations.
4	Law of KR "On Environmental Protection"	No.53 dtd. 1999 in the wording dtd. 27.04. 2009	Establishes the basic principles of environmental protection and provides legal authority to establish environmental quality, designate special protected areas, promulgate rules and procedures for the use of natural resources, establish environmental monitoring and control system and reinforce procedures for overcoming emergency situations. Among the standards and norms of environmental quality authorized under this law and related to the project there are: Standards of Maximum Safe Concentration of Hazardous Substances in Air and Water; Standards of Natural Resources Use; Standards of Maximum Safe Noise, Vibration Levels and Other Hazardous Physical Impacts. This law establishes the requirements for environmental examination (environmental assessment) intended by economic or other activities to prevent potential adverse environmental impacts. In addition, it prohibits financing or implementation of projects related to the use of natural resources without obtaining approval from the State Environmental Expertise.
5	Law of KR "On Environmental Impact Assessment"	No.54 dtd. 1999, in the wording dtd. 04.05. 2015	The main law related to environmental assessment. Its task is to prevent negative impacts on human health and environment occurring as a result of economic or other activities, and to ensure compliance of these activities with environmental requirements of the country.
6	Law of KR "General technical rules and regulations for environmental safety in the Kyrgyz Republic"	No.151 dtd. 2009	Is meant to protect the environment. It determines the main provisions for technical regulation of environmental safety and establishes general requirements for ensuring environmental safety during design and operations of businesses and other facilities of all legal and physical entities.
7	Regulation on procedure for conducting environmental impact assessment in the Kyrgyz Republic	No. 60 dtd. 13.02.2015	Establishes the procedure for assessing the environmental impact of the proposed activity (hereinafter EIA). The purpose of EIA is to prevent and/or mitigate the environmental impacts of the proposed activity and other related social, economic and other consequences.
8	Regulation on Water Zones and Strips of Water Bodies Protection in the Kyrgyz Republic	No.271 dtd. 7.07. 1995	Defines the procedure for establishing water zones and strips of water bodies protection in the Kyrgyz Republic Establishes a regime of economic activity and land use located in the water protection zones and strips. This law also defines responsibility for keeping them in

#	Legislation	Number & Year of adoption	Purpose/content
			proper shape.
9	Rules for the protection of surface waters in KR	on March 14, 2016 № 128	These Rules govern the protection of surface waters from pollution and depletion, in the implementation of the water users of different types of business activities that have or may have an adverse impact on the status of surface waters, irrespective of their legal form, as well as regulate the procedure for implementation of measures for the protection of surface water.
10	Law of KR "On Protection of Atmospheric Air"	No.51 dtd. 1999, in the wording dtd. 09.08.2005	Governs the relations on use and protection of atmospheric air.
11	Law of KR "On Production and Consumption Waste"	No.89 dtd. 2001	Defines the national policy in production and consumption waste management. It is aimed at preventing negative impacts from production and consumption waste on the environment and human health while handling it and their maximum involvement in the economy as an additional source of raw materials.
12	Law of KR "On Protection and Use of Flora"	No.53 dtd. 2001	Establishes the legal framework for ensuring effective protection, rational use and reproduction of flora resources.
13	Law of KR "On Wildlife"	No.59 dtd. 1999, in the wording dtd. 24.06.2003	Establishes the legal relations in the context of protection, use and reproduction of wildlife.
14	Law of KR "On local self-government and local state administration"	No.101 dtd. 2011	Establishes the principles for setting-up local authorities at the level of administrative and territorial units of the Kyrgyz Republic.
Legislation on Land Acquisition			
15	The Constitution of the Kyrgyz Republic	2010	Clause 12 recognizes a diversity of forms of ownership and guarantees equal legal protection of private, state, municipal and other forms of property (Clause 12, paragraph 1). Land can be of private, municipal and other forms of ownership except for pastures, which cannot be privately owned (Clause 12, paragraph 5). Property is indefeasible. No one can be arbitrarily deprived of his property. Seizure of property by the state against the will of the owner is allowed only by court decision (Clause 12, paragraph 2). Seizure of property for public purposes specified in the law is possible by the court decision with fair and advanced compensation of property cost and other damages caused as a result of such alienation. (Clause 12, paragraph 2).
16	Civil Code	No.16 dtd. 8.05.1996 in the wording dtd. 30.05.2013	Determines that the person whose right is violated can demand full compensation for damages, unless the law or agreement consistent with the law says otherwise (Clause 14, paragraph 1). The Civil Code specifies the following losses subject to compensation: expenses incurred or to be incurred by the person whose right is violated in connection with restoration of violated rights (Clause 14, paragraph 2); loss or damage to property (Clause 14, paragraph 2); lost income that would be received by the person under normal civil turnover conditions if his right was not violated (lost profits) (Clause 14, paragraph 2); Compensation for loss of profits along with the other costs, at least in the amount of such income, to the person losing land, assets or livelihood.
17	Land Code	No.45 dtd. 2.06.1999 in the wording dtd. 26.05.2009	Governs land relations in the Kyrgyz Republic, basis for the origin, procedure for exercise and termination of rights to land and their registration, and also aimed to create land and market relations in state, communal and private ownership of land and efficient use and protection of land. The Land Code is the main document, which regulates land use.
18	Law of KR «On transfer (transformation) of land»	No. 145 dtd. 15.07.2013	This law is developed in accordance with the Land Code of the Kyrgyz Republic and other normative legal acts of the Kyrgyz Republic. It defines the legal basis, conditions and procedure for transfer (transformation) of land from one category to another or from one type of land to another.

#	Legislation	Number & Year of adoption	Purpose/content
19	Law «On Highways»	No.72 dtd. 2.06.1998	According to Clause 4 the public roads are owned by the state and not subject to sale and cannot be passed into private ownership. This law (Clause 27) also provides that without prior approval of the State Automobile Inspectorate and the Ministry of Transport and Roads of the Kyrgyz Republic the following is prohibited among others: trade on the roadside; placement of kiosks, pavilions and similar structures; and, unauthorized use of road lands (Clause 23)
20	Regulation on valuation of assets		Valuation of assets is made based on the Provisional Rules of activities of valuators and valuation organizations (Government Resolution #537 dtd. August 21, 2003), property valuation standards (Government Resolution #217 dtd. April 3, 2006) and other national legislative provisions.
Law on Protection and Use of Historical and Cultural Heritage			
21	The Law "On protection and use of historical and cultural heritage"	No.91 dtd. 26.07.1999	Establishes legal norms for protection and use of tangible historical and cultural heritage on the territory of the Kyrgyz Republic, which is of unique value for people. The law is mandatory for all legal entities and individuals. It defines their rights and obligations in the context of protection and use of tangible historical and cultural heritage. Historical and cultural heritage are the historical and cultural monuments associated with historical events in the life of the people, development of society and the state, material and spiritual creative works representing historical, scientific, artistic or other value.
Law on Access to Information			
22	The Law "On access to information held by public bodies and local self-government of the Kyrgyz Republic"	No.213 dtd. 28.12.2006	This law regulates the rights and obligations of public authorities to provide information to the local population, in order to achieve transparency of work of public awareness
International Conventions and Agreements			
1	UN Framework Convention on Climate Change	2000	Combating global climate change and its consequences.
2	Aarhus Convention on access to information, public participation in decision-making and access to justice on environmental issues.	2001	To support the protection of human rights to a healthy environment and wellbeing, access to information, public participation in decision-making and access to justice on issues related to the environment.

39. Ratification of international legal acts involves implementation of international requirements into the national legislation and harmonization of the Kyrgyz legislation with the international legislation. However, this process is moving very slowly in Kyrgyzstan given that conventions are really frameworks that need to be translated into national laws, a process that is time consuming and complicated.

4. Permitting Processes in the Kyrgyz Republic

40. The assessment of the possible effects of economic and other activities on the environment and human health, as well as the development of a list of measures to prevent adverse effects (destruction, degradation, damage and depletion of natural ecological systems and natural resources), and improve the environment are carried out in the framework of environmental impact assessment provided the environmental legislation of the Kyrgyz Republic.

41. In this IEE, Initial Environmental Examination, was carried out according to the Regulations on the procedure for environmental impact assessment in the Kyrgyz Republic (13 February, 2015, #60); Regulations on the procedure of the state ecological examination in the Kyrgyz Republic (7 May, 2014, #248); Law "On Ecological Expertise" No.54 dtd. 1999, (with amendments as of 04 May 2015), the Law "On Environmental Protection" No.53 dtd. 1999, and the Law "general technical regulation on environmental safety." No.151 dtd. 2009. The

Environmental Management Plan (EMP) was developed on the basis of this IEE, design solutions and refined, was specified on this detailed design stage of the project. EMP reflects all the possible negative impacts that have been identified EIA and includes mitigation measures these effects.

42. Environmental assessment in Kyrgyzstan is founded on two subsystems: (i) OVOS (the Russian acronym for "Assessment of Environmental Impacts"), and (ii) Ecological Expertise (State Environmental Review, SER). Based on a "list", project screening is done to determine whether a project is the subject to environmental assessment or not. Since this was required, an OVOS is conducted by an OVOS consultant hired by a Project Proponent. The environmental assessment process produced this IEE documents which will be subjected for further reviews.

43. The IEE is now presented for public consultations, after which revisions are done according to the public's feedback. Subsequently, the OVOS report, Statement of Environmental Consequences, and other supporting documentations are submitted for the SER. After which the project may be approved, rejected or send for reexamination.

44. The outputs of the public consultation are incorporated in the Public Environmental Review (PER) which can be done on the stages of the OVOS. The SER duration depends on the complexity of the project, but should not exceed 3 months after submission of all the OVOS documents for the SER by the Project Proponent.

5. Environmental Standards

45. The following environmental standards are applied to the Project. International standards were also presented herewith for comparison with Kyrgyz standards; subsequently the more stringent standards shall be used as monitoring requirements.

5.1. Air quality

46. Maximum permissible concentrations of harmful substances in ambient air according to Kyrgyz and international standards below in Table 2.

Table 2: MPC of Harmful Substances

Pollutants	Maximum Permissible Concentration (mg/m3)			
	According to National Legislation	According to IFC*	According to National Legislation	According to IFC*
Particulate Matter	0,500	0,02	daily average	1 year
Sulphur Dioxide (SO2)	0,500	0,02	daily average	24 hours
Nitrogen Dioxide (NO2)	0,085	0,04	daily average	1 year
Carbon monoxide (CO)	3,000	0,10	daily maximum	Maximum daily 8hour mean

*World Health Organization (WHO). WHO Ambient Air Quality Guidelines.

5.2. Noise

Table 3: International (IFC) Noise Standards (dB)

Noise Level Guidelines*		
	One Hour LAeq (dBA)	
Receptor	Daytime 07:00–22:00	Nighttime 22:00–07:00
Residential; institutional; educational	55	45
Industrial; commercial	70	70

*Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organization (WHO), 1999.

Table 4: Kyrgyz Republic Noise Standards (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	

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".

5.3. Surface water

Table 5: Surface Water quality standards

Pollutants	Maximum permissible concentration (mg/m3)	
	According to national legislation	According to EC legislation
Turbidity	Not less than 20 cm	Not less than 1,0 meters/depth
Petroleum oils	0,3 ppm	not visible in the form of a film

GN 2.1.5.1315-03 with changes GN 2.1.5.2280-07 and SanPiN2.1.5.980-00.
Directive 2006/44 / EC of the European Parliament and of the Council of 6.09 in '06 on the quality of fresh waters needing protection or improvement of quality in order to maintain aquatic life.

6. Required ADB Environmental Approval

47. ADB requires the consideration of environmental issues in all aspects of its operations. Superseding the previous environment and social safeguard policies, ADB's Safeguard Policy Statement, 2009 (SPS, 2009) sets out the policy objectives, scope and triggers, and principles for three key safeguard areas: (i) environmental safeguards, (ii) involuntary resettlement safeguards, and (iii) Indigenous Peoples safeguards. ADB adopts a set of specific safeguard requirements that borrowers/clients are required to meet in addressing environmental and social impacts and risks. Borrowers/clients comply with these requirements during project preparation and implementation. The environmental safeguard requirements are indicated in Appendix 1 of SPS 2009 (Safeguard Requirements 1: Environment). This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, and loans involving financial intermediaries, and private sector loans.

48. In the ADB's Screening and Categorization, the nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project, the sensitivity, scale, nature and magnitude of its potential impacts, and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impact are assigned to one of the following four categories:

a. Category A. Projects could have significant adverse environmental impacts. An Environmental Impact Assessment (EIA) is required to address significant impacts.
b. Category B. Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.

c. Category C. Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.

d. Category FI. Projects 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 projects will result in insignificant impacts.

49. Environmental Management Plan: An Environmental Management Plan (EMP) which addresses the potential impacts and risks identified by the environmental assessment shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks.

50. Public Disclosure: ADB will post the following safeguard documents on its website so affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation:

a. For environmental Category A projects, draft EIA report at least 120 days before Board consideration;
b. Final or updated EIA and/or IEE upon receipt; and
c. Environmental Monitoring Reports submitted by Implementing/Executing Agencies during project implementation upon receipt.

51. ADB also requires public consultation in the environmental assessment process. For Category B projects, the borrower must consult with groups affected by the proposed Program and with local non-governmental organizations (NGOs) if possible. The consultation needs to be carried out as early as possible in the Program cycle so that views of affected groups are taken into account in the design of the Program and within the mitigation measures proposed. Any compensation related grievance redress issues will be resolved according to the Program's Resettlement Framework. A single Grievance Redress Mechanism (GRM) shall be set up to tackle both environmental and social issues for the project.

C. Description of the Project

1. Need for the Project

52. Since Kyrgyzstan is a mountainous, landlocked country, regional commerce depends heavily on road transport, which dominates the Kyrgyz transport system and heavily dependent on road transport. Railway/On water transport network is very limited to region while air transport is not feasible for mass transport. As mentioned in Country Partnership Strategy with ADB,1 the road infrastructure has been routinely affected by climate-induced extreme events, including extreme temperatures, landslides, and mudslides. It is for this reason that further investment will be needed in the rehabilitation and maintenance of the road infrastructure.

53. The proposed project will help link the southern regions of Osh, Batken, and Jalal-Abad with the northern regions of Naryn, Issyk-Kul, Chui, and Talas, and then further connect to the regional corridors. The project will: (i) reduce the cost of passenger and cargo transportation between southern and northern regions by providing direct access, (ii) provide a more direct transit route between Kazakhstan and Tajikistan, and (iii) help stimulate trade.

2. General information on project facility

54. This Section's starting point designated as Km 89, after Epkink village within Kochkor District. Generally, this Section follows the existing alignment up to Bashkugandy (km 159). The entire of this section is within Naryn Oblast and it traverses small western part of Kochkor District (Kochkor, as the capital); while the most part is in Jumgal District (Chaek as the capital).

55. These western parts of Kochkor Districts are vast tracts of agricultural lands devoted to farming and animal stock-raising. The road climbs to around 2,600 m which seem to be the highest point at Kyzart Pass after which it descends to Jumgal District. The high portion appears to be the boundary between Kochkor and Jumbal Districts, and also the delineation of the watersheds for the Chui and Jumgal Rivers. This high point on the road seems to be the saddle point between mountain ranges the run parallel east to west of Naryn Oblast. The terrain is characterized as undulating and mountainous and covered with grasses suitable for grazing. The table below shows the Geographical Jurisdictions that the road section traverses or is near to.

Table 6: Geographical Jurisdictions along the Road Section

Oblast	Rayon	Town	Village	Section / km
Naryn	Kochkor (Western Part)		Epkin	Km 89–Km 159
	Jumgal		Jumgal	
			Kuyruchuk	
			Tugol Sai	
			Bashkugandy	

Source: The Consultant.

The map of the project road is shown in the following page.

[1] Country Partnership Strategy: Kyrgyz Republic, 2013–2017 ADB, 2014.

Figure 1: Location Map of the Road Section.

56. Engineering-geological conditions of subgrade construction on the North-South Alternative road on the section between Epkin and Bashkugandy are favorable. Baseline with a length of 70 km is laid mainly on the existing roadbed with gravel envelope, in some spaces with asphalt coat. Coating is asphalt, mainly with a thickness of 5–6 cm, rarely 9–10 cm. Base of road pavement and is constructed from gravel, pebble and crushed-stone soils with sandy-loam, sandy fillers.

57. The road is in poor condition, the surface is bumpy with numerous patches, covered with frequent transverse and longitudinal cracks, often with crack network. The road goes along the Jumgal River and crosses Tugol-Sai river as well as other many feed and irrigation ditches and low places.

3. Type and Technical Road Category of the Project

58. The Section "Epkin (Km 89) to Bashkugandy (km 159)" will be upgraded to Technical Road Category II consisting of (i) pavement works – replacement and/or construction of new pavement structure; (ii) bridge construction/repair – mostly repairs of bridge decks; (iii) culverts and drainage works – replacement of old culverts and improvement of existing ones with installation of side ditches; (iv) road curvature improvements – for improved drivability and safety, curvatures and gradients will be improve, especially at existing narrow curves; (v) carriage way widening – in a number of spots the road width will be widened to allow for safe two-way traffic, and pedestrian access; (vi) slope cuts – due to necessary widening and safety; (vii) slope stabilization – cuts will be stabilized by structural works; and (viii) installation of road furniture – necessary safety features and furniture shall be installed at strategic locations along the road. The envisioned service life of the pavement based traffic load forecast is set at 20 years, with the normal routine and periodic maintenance.

4. Details of the Project

59. The details of the proposed road project are:

a. Rehabilitate and pave the project road to Technical Category II from “Epkin (Km 89) to Bashkugandy (km 159)” according to Kyrgyzstan National Standard with Geometrical and Structural Requirements.
b. Rehabilitation, repair and/or replacement of bridges and culverts.
c. Construction of side drains and other drainage structures.
d. Provision of retaining walls and river protection measures, where necessary.
e. Provision of adequate road signing and marking.
f. Provision of safety barriers.

4.1. Road Cross Section

60. The road is to be designed according to Kyrgyzstan geometric design standard, and accordingly, it shall be sufficient to carry the traffic loading efficiently and with the vehicles from the opposite directions can pass safely. Effectively, these will be a two-lane road consisting of a carriageway width (sum of the width of lanes) and the width of the shoulders. The design elements for the cross section of the project road are as follows:

(i)	Number of lanes:	2
(ii)	Lane width:	3.5–3.75 m
(iii)	Carriageway width:	7.00–7.50 m
(iv)	Width of shoulder:	3.25–3.75 m (of which 0.50–0.75 m is paved)
(v)	Total road width:	15.00 m

61. Planned volume of earthworks:

Table 7: Volume of Earthwork

Description	Unit	Quantity
Excavation of top soil (vegetative layer)	m3	282,800
Excavation to spoil of unsuitable and surplus material, common soil	m3	576,400
Excavation to spoil of unsuitable and surplus material, rocky ground	m3	84,500.00
Formation of embankment, common material from cut	m3	300,200
Provision of Subgrade, selected material	m3	128,800

Locations, type (cut or fill) and scale (length, width, depth/height) of earthwork are summarized in Annex A2.

62. The ensuing Figures are typical cross-sections for Technical Category II Road.

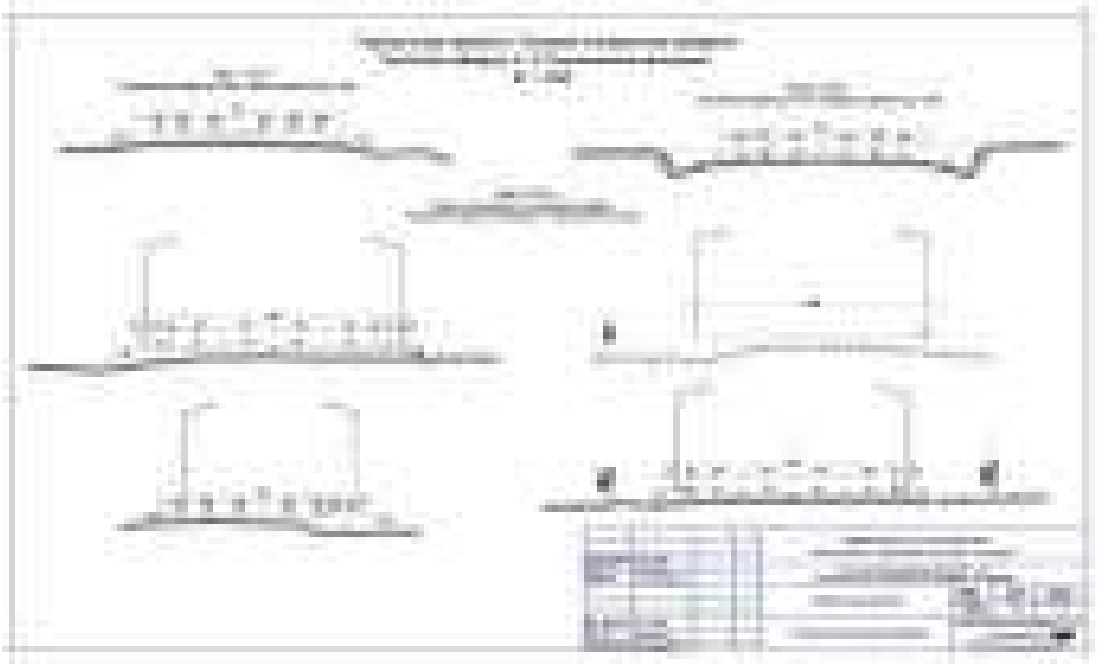


Figure 2: Technical Category II Road (Type 1-6).

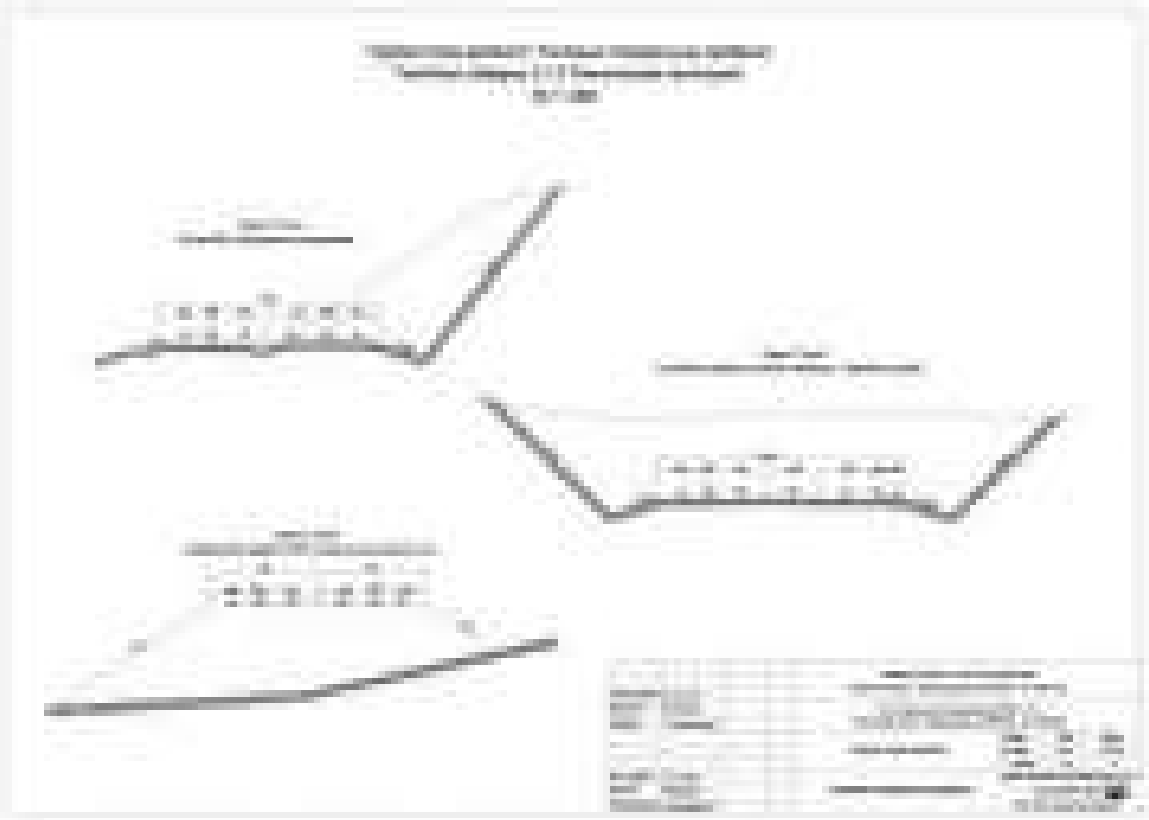


Figure 3: Technical Category II Road (Type 7-11).

4.2. Bridges/Culverts/Water pipe

63. There is one bridge along this section of the project road as shown in the Table 8 below.

Table 8: Bridge in the Section

No.	Bridge Location	Name of crossing watercourse	Span Scheme	Bridge length, m	Design bridge width, m	Proposed Rehabilitation Measure
1	148+874	Tugol-Say river	2x12,0	30,15	8+2x0.875	148+874

In addition, there are minor water crossings that may be repaired or reconstructed into box/pipe culverts. Estimate is 101 culverts in 2B Section and all of them are to be upgraded. Details of these culverts are summarized in Annex A3 Furthermore, there is a road crossing, underground water pipe is located at 149 km+955.

4.3 Powerlines

64. Very often, overhead powerlines are running along the road and sometimes crosses the road. Locations these powerlines are summarized in Annex A4.

5. Temporary Ancillary Facilities

5.1. Material Sources and Cut and Fill

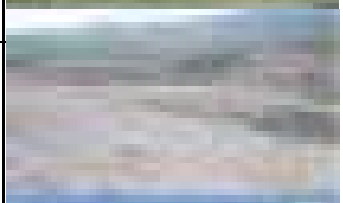
65. Considerable volume of materials will be obtained from borrow areas and will be used for construction of road embankments and bridge approaches. Several potential borrow areas are quite apparent in the general vicinity. During the construction, Contractor has to conduct his own investigation for material presence and determine the potential borrow pit locations, which may be used for the construction. The materials need to be approved by the construction supervision engineer prior to using them for the project.

66. Should the Contractor be sourcing the materials from existing and operational quarry site, the contractor should exert influence on the operator that all required permits from local authorities, get approval from territorial departments of SAEPF are obtained and proper operational and management measures be instituted to minimize impacts to the general environment. On the other hand, if Contractor is planning the new borrow pit, he needs to obey all required procedures, stipulated by the regulations of the KR, specifically Contractor should get all required approval documents for the site allocation for borrow bits or spoils from the local authorities, confirm with the territorial Environment Protection and Forestry departments under the Government of the Kyrgyz Republic, work out the “Development and reclamation plan for the borrow pits” and submit all required documents to MOTR for getting the license for borrow pits development from the State Committee on Industry, Energetics and subsoil of the KR. Those actions are not required during the using the existing borrow pits. In case of using the private borrow pits, all approval documentation (licenses, confirmation with the local authorities, SAEPF under the Government of the KR, etc.) are the responsibility of the borrow pit owner, which needs to be indicated in the agreement between Contractor and Owner.

5.2. Construction materials

67. Table 9 provides a list of possible sites for borrow areas. Reuse of cut material is recommended.

Table 9: Possible Borrow Areas

No.	km	Description	Availability	Photo
1	94	Old borrow pit with sandy- gravel material (RHS). Potential material source to be verified	Yes	
2	108	There is a rock deposit with sandy- gravel ground which can be used as a borrow pit.	Yes	
3	111	There is an old borrow pit with sandy-gravel materials (RHS)	Yes	
4	112.8	Slope deposit	Yes	
5	111.9	Slope deposit	Yes	
6	122	There is an old borrow pit with sandy-gravel material (LHS) in 125 m away from the road	Yes	
7	141.3	Old quarry loamy soil (RHS) 150 mfrom the road	Yes	

Source: JOC

5.3. Asphalt and Cement Batching Plants

When selecting the site for installation of the asphalt plant, the choice of site for the installation of asphalt and stone crushing equipment, which are sources of emissions, noise and vibration, the Contractor should be guided by a number of environmental protection points, according to SanPiN 2.2.1 / 2.1.1 and 2.2 SanPiN. 1 / 2.1.1.006-03 and organize special buffer zones around such objects. In KR, such a zone called the sanitary protection zone, which is an indispensable element of any object that is the source of the impact on the environment and health. These objects should be placed at an appropriate distance from houses (at least 500m), as well as water (at least 50 m), to avoid contamination of water. Given the fact that the project road runs through the countryside, there is enough space for the construction of these plants. The Contractor shall obtain the necessary permits, conduct all the necessary negotiations with the land owners are properly used and to restore areas of the territory after the completion of the project.

5.4. Construction Camp

Selection of the necessary land for the construction of the camp is the prerogative of the Contractor, as well as negotiate directly with landowners and obtaining the necessary approvals for its facilities. For the organization of construction camps are free sites, and the Contractor may choose the appropriate area for their location. The proper maintenance of all the service and sanitary facilities at the construction camp falls under the direct responsibility of the Contractor under the supervision of the construction supervision engineer for the project. The sanitary facilities or ablution include toilets, urinals, showers, washstands and a laundry area. In addition, equipment and maintenance yard will also have to be sited accordingly. Waste water should not be discharged into the river unless treated in compliance to local effluent standards. Solid waste collection and disposal should be planned properly. Liquid waste discharge into water is prohibited. Area for parking and maintenance of construction machinery and equipment must also be equipped accordingly. Designated placement of Contractor's camps and placing the production base will determined by Contractor in the period of mobilization. It will be up to the Contractor and his responsibility to select the land parcels required.

6. Alternatives

68. Results of the Manual traffic for road section counting converted into AADT by each vehicle type (Year 2015) in view of seasonal and daily correlation is shown in Table 10 below[2].

Table 10: Traffic Volume Counted and Predicted (2015)

Analysis section	Name of the section	Vehicle Type	Car	Light Bus/Van	Medi-um Bus	Large Bus	Light Truck Pick Up	Medi-um Truck 2-axle	Heavy Truck 3-axle	Truck trailer	Truck Semi trailer	Total
	Dyikan, km150 Epkin-Dyikan	Existing Traffic	673	24	66	2	54	31	51	35	30	966
		Diverted new traffic	1298	474	147	0	87	74	54	83	217	2434
		Total AADT	**1972**	**498**	**213**	**2**	**141**	**105**	**105**	**118**	**247**	**3400**

Data Source: Kocks' Interim Report

69. Two alternatives were considered in this IEE:

[2] This is part of the Economic Report for IEE

(i) Zero option - inaction / do nothing
(ii) The road reconstruction project

The “Zero option” alternative scenario will mean that the road stays “as is”, in which no rehabilitation works. Considering the mentioned reasons and along with those presented in the “Country and Regional Strategy” and “Locality Specific Rationale”, the benefits of rehabilitating and reconstructing the road generally outweigh the expectations of the “zero option” alternative.

The second Alternative is considering the road reconstruction for the Category II which will be on the existing road in the section Epkin (Km 89) to Bashkugandy (km 159), 70 km. According to the Kocks’ Interim Report, Kocks will present the results of economic analysis in their final report quantitatively.

7. Traffic Volume

70. As per estimate in the traffic study, the growth rate is as follows: (i) 2011-2024 = 4.2%; (ii) 2025–2029 = 3.7%; (iii) 2030–2035 = 3.2%; and (iv) 2036–2040 = 2.8%. After adding the diverted traffic and applying the growth rates the future traffic are around 2,434 cars. Comparing this value with Road Classifications for Kyrgyz Republic, it shows that Category II road will be sufficient to service the future traffic.

8. Proposed Schedule for Implementation

71. The schedule for the construction activities is at preliminary stage. The detailed design consultant will have to be recruited who will undertake the necessary design finalization along with all the contract documents. This IEE will form a part of the contract with specific provisions to form part of the Technical Specifications. The anticipated start of construction will be around March 2017.

D. Description of the Environment

1. Topography, Geology, and Soils

72. The road section «Epkin (Km 89) to Bashkugandy (km 159)”, starts west of Epkin village which is part of the Kochkor District. This area is part of the Kochkor valley which is described as a cavity with a base altitude 1800¬2500 m, length of 80 km, and a width of 20 km. The general area can be considered as steppe environs with fragments of forests and meadows. Near the road, agriculture and animal herding are the main activities.

73. Around 20-25 km west of the section’s starting point; the road ascends at its highest point at Kyzart Pass with an elevation of around 2600 meters. Its highest point, the Kyzart Ridge has a maximum height of 4400 meters (average height of 3800 m), length of 30 km, and maximum width of 16 km. At this point the basins divide into Kochkor River basin in the east and Jumgal River basin in the west. The general terrain at both sides of the road is mountainous and mainly grasses which mostly found in spring and summer. Shrub vegetation’s (Barberry (Berberis spp), Wild Rose (Rosa spp), Buckthorn (Hippophae rhamnoides), Caragana spp and others) can be found along the creeks that drains into the main Kochkor and Jumgal rivers.

74. At around km 128, the road descends into the Jumgal valley - altitude valley bottom basin 15002600 m, length of 80 km within the bottom, within the maximum width of the bottom 25 km –

and enters the Jumgal village and proceeds along the valley floor up to Bashkugandi (elevation 1850m). The roadside terrain is mainly grassland devoted to animal grazing. Local vegetation is sparse, however in some parts of the road are lined with trees (mainly poplars, elms and black locust).

2. Climate

75. Much of the Naryn regions are ridges. The climate is continental; winter is cold and long. The-lowest absolute temperature gets as low as - 45°C (below zero). The summers are short and cool. There are several climatic zones in the area: (i) at the height of 1400--1600m above sea level - desert, semi desert; (ii) 1600--1800m, 1800--2000m – steppe; (iii) 2500--4000m subalpine and alpine zone;(iv) above 4000m zone of eternal snows.

76. The average temperature in January is - 15°C. The absolute minimum temperature (-50°C) was registered on the territory of Ak-Sai valley. In the area of the lake Chater-Kël, valleys: the Ak-Sai, Arpa, in the upper reaches of the Naryn, in the basins Son-kul have cold winters, warm summers short. During the day characterized by abrupt changes in temperature may be freezing even in the summer months. Average annual precipitation on the plains is 200-300 mm in the mountains a little more. The period of heavy rainfall in the second half of spring and the first half of summer, when the fall of 30 to 60% of annual precipitation. In the valleys of the amount of precipitation increases from west to east. The snow cover is in the valley of the up to 40 cm, in the mountainous area of up to 80 cm. In Kochkor valley because of strong winds snowfall are rare, and cover is unstable.

3. Hydrology, Water Resources, and Water Quality

77. Naryn region has more than 5,000 rivers and streams. Highland ridges of the perennial glaciers that give rise to many rivers that go far beyond the region. Glaciers are located at an altitude of 4000 m. The total area of glaciers is about 500 km2. Most glaciers are located on the ridges of Kakshaal. The largest is the Ak-Sai Ai-Tal Ortho-Tash. Also in the region, there are numerous alpine lakes and the biggest of them are Son-Kol and Chatyr -Kol.

78. Within the Naryn region flows the longest river of the country - the Naryn River, which supplies seven hydroelectric power plants. Naryn River is providing a huge flow of water that significantly affects the economic activity not only in Kyrgyzstan, but also Uzbekistan, Kazakhstan and Tajikistan. It flows within the ranges of 10-14 cu.km. The most important tributaries of the Naryn River: Small Naryn (407 m^3 / s), On -Archa (160 m^3 / s), Dzhergetal (65.4 m^3 / s), Kok -Gert (Kazhyrty) (64.5 m^3 / s). The Syr-Darya River within Naryn forms the second largest river in Central Asia - the Syr Darya.

79. The eastern watershed before the Kyzart pass forms the catchment that drains into Orto-Tokoi Reservoir via Kochkor River. The main rivers in this area are Zhany-Aryk River that joins Koch-Kor River at Km 67. The Kochkor River is a river in Kochkor District of Naryn oblast. It is formed by confluence of Karakol and Seok rivers. The river is 45 kilometers (28mi) long, the basin area 2,590 square kilometers (1,000 sqmi), and the average annual discharge 12.6 cubic meters per second (440cuft/s). Chu River is formed by the confluence of Kochkor River and Zhany-Aryk River near village Kok-Jar.

4. Ecological Resources in Project Area

80. Naryn oblast is considered rich in flora and fauna. Some of the species that thrive are

relict Tien Shan blue spruce, herbs: buckthorn, ephedra, zverovoy, yarrow, valerian, wild rose and manyo thers. In the area, there are reserves: Naryn and Karatal-Zhapyryk reserves, hunting re-serves: Kochkor, At-Bashy, Ugut etc. The planned section of road is out of the lands of specially protected natural territories.

4.1. Flora

81. Territory of the Epkin - Bashkugandy section refers to arable irrigated land on the site of steppes and deserts. According to geo-botanical subdivision, the territory refers to inner Tien Shan province.

Range of vegetation types. Desert: thorn cushion plant, sod-grass steppes, tall grass meadow, cryophilic cushion plant, swamps, spruce forests, leafy summer green forests, deciduous shrubs and juniper stands. Great area is occupied by primitive plant aggregation with sparse vegetation. Type of belts - deserted - steppe with fragments of forests and meadows.

Dominant vegetation is: *Sympegmaregeli*, *Silver willow* (*Salix acutifolia*), Sea buckthorn (*Hippophaerhamnoides*), *Geranium regelii*, *Geranium himalayense*, *Kalidiumcuspidatum*, *Reaumuriasoongorica, Acantholimonalatavicum, Artemisia tianschanica, Stipacaucasica, Festucasulcate,Phlomisoreophila, Carexstenocarpa*. Out of medicinal plants, there grow Begger's rose, loose rose, Ural licorice.

4.2. Fauna

82. The territory of the project area is desert and semi-desert. By geographical zoning, the territory refers to inner Tien Shan and midland. Representative species of the given territory are:

a. Reptiles: desert lidless skink, lizard, arrow-snake, copperhead;
b. Birds: little owl, mongolian plover, short-toed lark, tawny pipit, common chats, black redstart, rocky nuthatch, desert mongolian finch, roodyshelduck (in reservoirs), bearded partridge, chukar partridge (in open habitats), turtle dove, black-bellied sandgrouse flies;
c. Animals: great horseshoe bat, sharp-eared owl-moth, tolai hare, sand eel, steppe polecat, stone marten, gray marmot, muskrat (in reservoirs);
d. Fish: Suusamyr scaly osman, Marina, trout, snakehead.

5. Endogenous and Exogenous Processes

83. **Seismic hazard**. According to seismic regionalization of the Kyrgyz Republic territory, the project area relates to 8-point seismic zone (SNiP KR 20-02:2009).

84. **Mudflow hazard**. Mudflow of storm origin may take place in Bashkugandy and Zhany-Aryk rural districts by threatening homes, bridges, roads and channels. Mudflow may take place once in two or more years on the major part of the area's mountainous territory. Mudflows of storm origin may happen within April-September, most likely within May–July.

Table 11: Forecast of Possible Activation of Mudflows and Floods

№	Rural district	River	Settlement	Facilities that might be affected
2	Bashkugandy	Mudflows, right bank, Bashkugandy River	Bashkugandy village	houses, homestead lands
27	Zhany-Aryk	Mudflows		Kok-Jar, Shybak canals

Source: MES KR website, 2015.

85. **Flooding.** Areas with high levels of groundwater are confined to lower terraces of Jumgal, river' valleys.

Table 12: Forecast of Possible Development of Flooding Processes

№	Rural district	Settlement	Flooding reasons	Recommended safety measures
45	Zhany-Aryk	Kyzart village	High ground water level	Construction of collector drainage network.
		Zhany-Aryk (northern part)	High ground water level, collector drainage network silted.	Clean-up, rehabilitation and construction of collector drainage network
50	Kuiruchuk	Kuiruchuk village	High ground water level	Regulation of irrigation, follow-up survey
53	Tugol-Sai	Tugol-Sai village	High ground water level	Conduct of geo-engineering survey
66	Cholpon	Epkin village	High ground water level	Construction of collector drainage network

Source: MES KR website, 2015.

6. Socioeconomic Information

86. **Kyrgyz Republic** - a sparsely populated country. Its population is more than six million people (2015), of which nearly one-third lives in urban areas and two-thirds in rural areas.

87. Kyrgyzstan is a mountainous country with dominant agricultural sector. Cotton, tobacco, wool, and meat are the main agricultural products, although only tobacco and cotton are exported in considerable quantity. The industrial exports include gold, mercury, uranium, natural gas, and electricity. Kyrgyzstan's economy is heavily dependent on two major items: (i) on gold exports - mainly from output at the Kumtor gold mine; and (ii) on remittances from Kyrgyzstani migrant workers primarily in Russia.

88. According to preliminary estimates of the National Statistical Committee of the Kyrgyz Republic, economic growth amounted to 103.5% in the country by the end of 2015, the gross domestic product (hereinafter - GDP) was formed in the amount of 423.6 billion soms. The GDP deflator was at the level of 102.2%. Excluding enterprises developing the Kumtor real GDP growth amounted to 104.5%, a similar figure was 105.0% in 2014. Economic growth is provided by almost all economic sectors, except industry, which is estimated positive contribution in agriculture 0.9 percent, construction - 1.1 percentage points, the service sector - 1.7 percentage points. The negative contribution to GDP made manufacturing industry of 0.7 percentage points.

89. The Social Development Policy, as before, focused primarily on the full implementation of guaranteed social obligations of the state, to raise living standards and improve the situation of socially vulnerable categories of citizens.

90. The overall goal of the state strategy of development of the country is to increase the level and quality citizens life through sustainable economic growth, the creation of conditions for full employment, high and stable income, the availability of a wide range of social services, maintaining high standards of living in a supportive environment for health.

91. One of the main priorities of the development of society in the Kyrgyz Republic is education. In recent years, as a result of the measures taken for the conservation of the infrastructure and the financial settlement of the activities of preschool institutions, their number increased from 691 in 2010 to 1062 - in 2014, and the number of children in pre-school

institutions compared to 2010 increased 1.8 times in 2014. It amounted to 152.2 thousand. At the same time, despite the steady increase in the number of children under the age of 7 years, attending pre-school educational institutions, their share is still low, and now stands at 19.5 percent on average in the country. The number of day schools rose from 2,197 in 2010 to 2205 in 2014, and the number of secondary vocational schools for this period increased by 5.7 percent.

92. Held in the Republic health care reform in the framework of the program of state guarantees will reduce the financial burden for the population and improve accessibility to health services for vulnerable groups. In 2014 network of medical institutions was represented by 65 family medicine centers, as part of which 579 work groups of family doctors.

93. The most important indicator of the state of the living standards of the population and the labor market is the salary. In 2014 the average monthly nominal wage increased in comparison with 8.3 per cent the previous year and amounted to 12 285 som. Size of real wages in 2014 compared to 2010 increased by 1.3 times, with an increase in the average nominal wage in this period is almost 1.7 times.

Regional Information

94. Naryn Oblast is situated in the southeast of Kyrgyzstan is bordered on the east by the Issyk-Kul, in the north - Chui, in the west - Jalal-Abad and Osh provinces in the south - with China. The region consists of 5 districts (Ak-Talaa, Al-Bashy, Jumgal, Kochkor and Naryn). Naryn City is the administrative center of the region and the largest city in the Inner Tien Shan. Its total land area is 45.2 thousand square kilometers, accounting for 1/4 of the territory of Kyrgyzstan, and with 249.1 thousand people, which is 5.2% of the country's population.

95. In the past years, the Regional Gross Domestic Product (RGDP) of Naryn oblast averages around 274.9 million or 6,709 Soms per capita. The composition of RGDP by sector is as follows: industrial sector 114.6 million Soms per year; retail sector 30.6 million Soms; services sector 38.6 million Soms; and construction and assembling works 91.1 million Soms.

96. The Oblast's main imports include industrial chemicals, metals and machinery, while the exports are comprised of livestock, livestock products including hides, minerals, textiles and textile products. The main livelihood in Naryn Oblast is engaging in animal husbandry or agriculture. Private farms cover less than 5% of the utilized land area of the Oblast, with significant overgrazing in many places as distant pastures are not accessible due to poor road networks.

97. In 2015, in comparison with the year 2014 on the area:

- the volume of industrial production amounted to 100.8%
- Gross output of agriculture, forestry and fishery products totaled 104.4%
- Average monthly wage per employee in 2015 amounted to 12,874 Soms (in 2014 was 11 013 Soms).

Local Information

98. The Section - «Epkin (Km 89) to Bashkugandy (km 159)" - of the project road passes mostly through the several villages of Jumgal Rayon. Basic social infrastructures are available in

these villages, such as drinking water, and electricity. For heating purposes, local people use charcoal and firewood. All of the villages have schools, with kindergartens in large villages.

99. Village Medical Points are found in every village and in rayon centers there are hospitals. Transport infrastructure is the main road with an asphalt surface (cold asphalt) and dirt roads. The bulk of the population is engaged in agricultural activities and livestock. The main products are wheat, potatoes, barley, meat, milk, wool, eggs.

7. Cultural and Archaeological Resources

100. There are several objects of cultural and historical significance in the project area. One notable item though is the presence of burial sites and cemeteries along the road. It is important that the road design and consequently the construction will ensure that impacts will be avoided or minimized. To obtain more detailed archaeological, cultural and historical information, a local specialist was engaged by PPTA to undertake this scope. This specialist had conducted a separate field work and presented his findings in a report.

101. In March 2016, an archaeological investigation was performed by a local archaeologist, historical and cultural heritage sites and objects in the vicinity of the project within the territories of Ton district of Issyk-Kul, and Kochkor and Jumgal district of Naryn oblast, Jaiyl district of Chui oblast in accordance with the Technical instructions and norms of the method of archaeological investigations[3].
Within the section the significant archaeological resources consist of the following:

a. Complex mausoleums (N41.97764 E74.91014) – around 75 km from Kochkor to Chaek. This complex of mausoleum is transected by the road at this spot, and which is dated back to XVIII-XIX cc, 138 km Clay mounds. Located close to the road (3 - 3,5 m) on the RHS and approximately 100 meters to the LHS.

[3]Provisional Regulations on the procedure of the archaeological survey. Approved by Decree of the Government on July 11, 2014 under the number 386; Avdusin DA Field Archaeology of the USSR. - M., 1980. - p.58-113.

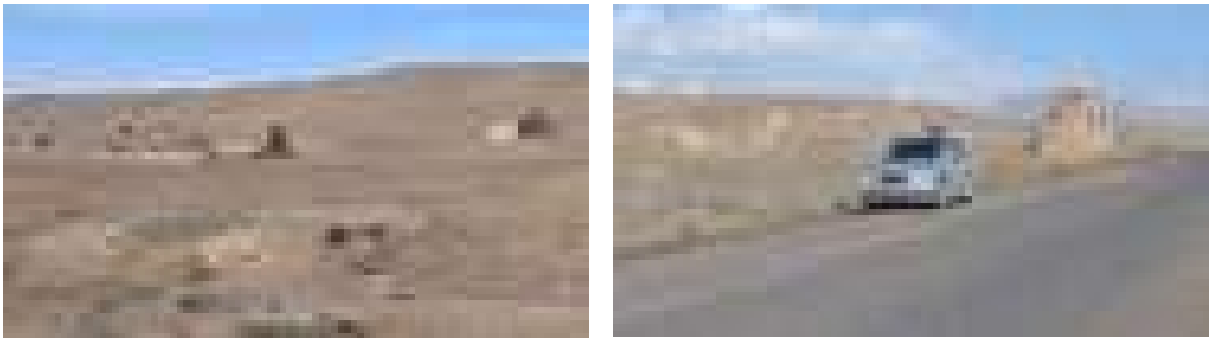


Figure 4: Complex mausoleums (N41.97764 E74.91014).

102. Based on the results of the research, report has been prepared, which was sent to the Ministry of Culture and Tourism of the Kyrgyz Republic (MoCIT KR) for opinion (Appendix F). This object of historical and cultural heritage is the object of study and protection of MoCIT KR. To prevent exposure to this object it is necessary to develop Management plan for object of cultural heritage, according to the law protection zone of object is not less than 50 m. Therefore, all questions related to the establishment of protection zones, procedures, management plans should be coordinated with MoCIT KR and local government.
On the basis of the findings (Appendix F), during the detailed design, Consultant should send the road design along with the Management plan for object of cultural heritage for coordination with MoCIT KR.

103. In accordance with the Law of the Kyrgyz Republic on historical cultural heritage (art. 32, 33) in the event of cultural monuments found, all construction works must stop and report the findings to the local executive authorities or any other competent organization (Institute of History and Cultural Heritage, National Academy of Sciences; Department of History, Kyrgyz National University after Balasagyn), and in MoCIT KR.

8. Sensitive Receptors

104. Sensitive receptors are those areas where the occupants are more susceptible to the adverse effects of exposure contaminants, pollutants and other adverse substances that the activities may generate. These generally include, but are not limited to, hospitals, schools, bazaars, mosques/churches, convalescent facilities and cultural, historical or archeological sites. Such facilities along the project road section as referred to the alignment sheet are:

a. Jumgal village (km129+400) – near the school along the road, LHS;
b. accumulating reservoir of drinking water from the water catchment devices for subsequent transportation to customers. Kuyruchuk (141 km + 800m
c. Kuyruchuk village (km144+000) – near the Azamat shop, RHS;
d. Tugol Say village (km151+000) – near the shop of Kutman, LHS
e. Bashkugandy village (km 159+000) – near the school adjacent to the road, RHS
f. River Tugol-Say, bridge location (km 149+600);
(vii) Pond for irrigation (km 140+600);
(viii) Irrigation channel (km 141+800);
(ix) Cemeteries:
- ✓ 158 – 160 km Cemetery on the (LHS), around 6 m from the road.
- ✓ 153 km -155 km Cemetery (RHS) on a hill 20-50 m away from the road.
- ✓ 152 +300 km Cemeteries on the both sides for Tugol-Say village. The

distance between the boundaries of the two cemeteries, 25m; width of the existing road 13.4m. From the border of the cemetery (RHS) to the road 3 m; opposite side (LHS) 3-5 m.

- ✓ 141 km +300 Cemetery on the left side (LHS) of the road, 10-15 m from the road.
- ✓ 138 km Complex mausoleums - Clay mounds both sides. Located close to the road (3 - 3,5 m) on the RHS and approximately 100 meters to the LHS.
- ✓ 132 km Cemetery on the LHS located around road 20-30m from the road.
- ✓ 131 km Cemeteries on the both sides (RHS - 3 m, LHS – 3,5 m from the road).

105. Aside from the possible impact due to noise, dust, vehicular emissions during construction and operations of the project, public safety can be a concern when trucks, equipment and construction materials are brought to the sites near these sensitive receptors. Disturbances may occur during class hours and treatment period and traffic safety may be concern with hazards to children as they walk or commute to and from schools.

9. Baseline Measurements

106. Baseline measurements in water quality, air quality and noise/vibration were obtained in selected spots. Water quality measurements were obtained where construction will impact river quality. Air quality and noise/vibration measurements were obtained in likely receptor areas. These results shall be used as reference parameters in monitoring the impacts of construction and operations of the project. International standards were also presented herewith for comparison with Kyrgyz standards; subsequently the more stringent standards shall be used as monitoring requirements.

107. Water quality and air quality measurement were done by the Ecological Monitoring Department of the SAEPF. While noise and vibration measurements were done by the Department of the sanitary protection of the Ministry of Health in the previous IEE. In this version, noises were monitored by JOC additionally at several points close to the settlements.

9.1. Water Quality Measurements

108. During a meeting with ADB for baseline data in water quality, it was decided that measurements would be done for the most relevant parameters: Turbidity and Total Petroleum Hydrocarbons (TPH). Therefore, the contracted laboratory was instructed to obtain the measurement in bodies of water adjacent to or being crossed by the project road. Within the section Epkin (Km 89) to Bashkugandy (km 159), water body crossing the road is Tugol-Say River. However, for this site no water quality measurement was done for the baseline survey, since civil engineer has not decided on bridge replacement or rehabilitation options, during the first field visit in October 2015. In subsequent phases, need to conduct water quality measurement in this point designated for monitoring purposes.

- River Tugol-Say, bridge location (km 149+600);
- Pond for irrigation (km 140+600);
- Irrigation channel (km 141+800);

109. The water quality parameters to be applied within the in the monitoring activities during construction is shown below.

Table 13: Water Quality Measurement Parameters the Section

No	Locations	Km in Road	Turbidity cm	TPH, mg/l
Maximum Permissible Concentrations (MPC)				
According to national requarements			Not less than 20	0.3
According to EC legislation			Not less than 1,0 metres/depth	Not visible in the form of a film
Tugol-Say river, Bridge(148+874)			-	-

9.2. Air Quality Measurements

110. Measurement results will serve as reference values for monitoring during the construction phase. Air quality was measured at 4 points along the road, which were identified as areas sensitive to air pollution due to the proximity of schools, street markets and other special facilities.

111. In the project area there is no large industrial source of pollution affecting the air quality, but it is polluted by dust from cars. The nearest station air quality monitoring from the project area is located quite far away - in Tokmok (Chui valley) and Cholpon-Ata (Lake Issyk Kul). Naryn region has no air quality monitoring stations.
Most of roads are located along foothill and mountain areas with the perimeter surrounded by mountain ranges. The height of the terrain within 700 - 3615 m above sea level. Within the territory dominated by wetlands are dotted with sparse vegetation.

112. The only source of dust, noise and vibration is road transport. The content of inorganic dust in the air due both to climatic conditions of the region and with the movement of vehicles. For air quality the most relevant parameters to be measured would be Dust, SO2, and NO2. Accordingly, the contracted laboratory was instructed to obtain the measurement in populated areas along the project road. The results of such air quality testing are shown below.

Table 14: Air Quality Measurement Results

No.	Measurement Point Locations	Chainage	Air Quality Parameters (mg/m3)		
			Dust	SO2	NO2
Maximum Permissible Levels (KR standards)			0.5	0.5	0.085
Maximum Permissible Levels (IFC (WHO standards))			0.02	0.02	0.04

Note: Measurements done in Nov. 30 – Dec. 3, 2015. Annex E.

9.3. Noise and Vibration Measurements

113. The main sources of the noise in the study area are those generated by vehicle engines, especially those carrying heavy loads running over unpaved road and at low speed. This noise is also aggravated by the noise of friction of tires on the road surface. Since there not many

settlements in the area, noise is not a major problem.

114. The noise level is expected to decrease rapidly with distance from the road, all noise measurements were taken at 3 m from the roadside: at a distance of 8-9 meters from the road where reconstruction will be done, noise level drops to a level less than 60 dB (a), i.e. up to the recommended maximum level at night for the populated areas. According to the regulations limits outside noise from road transport is 80 dBA for vehicles with an engine capacity of 150 kW or more. When measuring noise in the environment as it is necessary to measure the wind speed, air temperature, barometric pressure, altitude and time data recording of the measurement (e.g., day or night) and among all, distance from the road and number of passing vehicles during monitoring. Distance from the road and no. of passing vehicles while monitoring is critically important to correlate noise levels to them for future prediction.

115. Vibration is a danger to human health and the environment and mainly generated by transport, construction equipment, industrial facilities and other sources. In the area of the planned works vibration occurs when operating heavy vehicles. The most effective vibration shield can be realized at the stage of designing the project. When designing the vibration parameters will govern: sanitary and technical standards for vehicles and vibration sensitivity for building structures. Normally, as a means of protection against vibration effects on the environment is the usage noise protection wall or fence of varying heights. Low construction near the tracks can significantly reduce vibration exposure. The simplest and most effective is the usual earth mound with upset it shrubs, which also serves as a sound absorber, and at the same time strengthens the roots of the earth mound.

116. The enforcement of the standards of pollution noise and vibration lies with the Department of Sanitary and Epidemiological Surveillance Ministry of Health of the Kyrgyz Republic. The measurements were done for points at 7-10m,20 m from the road center. The noise and vibration levels are below the prescribed limits as shown below.

Table 15: Noise and Vibration Measurement Results

No.	Measurement Points	Locations	Aspects		
			Noise, dBA		Vibration, dB
			Day	Night	
KGZ Maximum Permissible Levels			70	65	108
IFC Guidelines: - for Residential; institutional; educational			55	45	
- for Commercial & Industrial			70	70	
1	Small Settlement	92+600	62.5		
2	Small settlement	103+000	57.6		
3	Jumgal village, near the school on the road, LHS	129+400	69	-	92
4	Kuruchuk village, near the Azamat shop, RHS	144+000	58	-	91
5	Tulgo Say village, near the shop Kutman, LHS	151+000	53	-	92.3
4	Bash-Kuugandy village, near the school adjacent to the road, RHS	159+000	42.7	-	95

Note: Measurements done in Nov. 30 – Dec. 3, 2015. Annex E. for No.3-5.
For No.1 and 2, measurement was done using Handy type equivalent noise level meter.

E. Environmental Impacts and Mitigation Measures

1. Impacts in the Project Phases

117. For the Section Epkin (Km 89) to Bashkugandy (km 159), the construction entails a number of activities which are expected to introduce impacts and disturbances to the general environment, especially during the construction period. Most of these impacts are confined within the right-of-way, construction sites, and facility sites; while some activities can affect the outlying areas or even a wider area, especially if not properly mitigated.

118. The environmental impacts and mitigation measures presented in the IEE Report were based on the results of the conducted field surveys. The section Epkin (Km 89) to Bashkugandy (km 159), will entail upgrading of road along its existing alignment. Due to the fact that the project includes the rehabilitation of the existing road, and within the Project area of influence there are no protected areas, it is expected that the emergence of the environmental impact is mainly due to the construction stage. The most serious effect is the result of construction works during the construction phase. The most serious effect refers to the human environment, in particular, it is associated with noise exposure, pollutant emissions and vibrations within the intersected settlements, especially in those places where the project road passes close to sensitive receptors effects, such as schools, hospitals, mosques, market, historical and archaeological sites or others. It is anticipated that main impact categories will be due to the following activities: (i) construction works within or close to settlements result in noise, vibration 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, (iii) 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 (iv) impacts from bridge rehabilitation/construction, (v) potential impacts on surface waters and potential impacts on natural habitats and biodiversity. In this IEE, prediction of air pollution, noise and vibration was attempted for 2017,2020 and 2030 respectively

119. Sensitive noise receptors along the project road are:

a. Jumgal village (km129+400) – near the school along the road, LHS;
b. Kuruchuk village (km144+000) – near the Azamat shop, RHS;
c. Tulgo Say village (km151+000) – near the shop of Kutman, LHS
d. Bashkugandy village (km 159+000) – near the school adjacent to the road, RHS
e. Complex of mausoleums (km 138) – RHS, LHS.
f. Cemeteries and mausoleum.

On territories of villages, sensitive recipients are hospitals, schools, gardens and historical & archaeological structures adjacent to the road. The main impacts from reconstruction of the road are described below.

Air pollution

120. Along the road, air may be polluted due to the increase of passing vehicles after rehabilitation throughout years. During construction period also, air is polluted by exhaust emissions of construction equipment and dust. Air pollution during construction will be of short duration and will have minimal impact on people Generally, concentration of harmful products in the air decreases as the distance from the carriageway grows and it depends on wind speed and

direction and on value of incoming solar radiation.

121. Air pollution along the road, 6m away from the road centerline was predicted during operations and construction respectively as:

Table 16: Prediction of Air Pollution along Project Road

Year	Stage	Monitored or predicted	Daily traffic no.	Traveling speed	NO2	Dust	SO2
			No.	km/h	ppm	Ppm	ppm
Environmental standard					85	500	500
2016	Before construction	Monitored	-	-	(20-30)	(280)	(<50)
		Predicted	1,005	60	30	<280	<50
2017	During construction	Predicted	1,045	60	303	<289	<50
	After construction	Predicted	3,742	100	32	<280	<50
2020	After construction	Predicted	4,210	100	33	<280	<50
2030	After construction	Predicted	6,231	100	35	<280	<50

() monitored figures by Kocks at the distance 3m from road edge 15m is the minimum ROW width from road centerline
"Dust" was included in "SPM" in the table.

As shown in the above table, no air pollution is caused by passing vehicles during operation. An issue is NO2 of 303 ppm, above the allowable limit of 85 ppm emitted from heavy equipment, during construction. Other material is within acceptable range.

122. Dust is generated by unpaved road mostly and the portion emitted from vehicles is negligible to this 280 ppm. Therefore, dust concentration will be reduced even if vehicle number increase after paved in the future.

123. "Falling dust" generated by earth work and lorry passing along unpaved road at the location 6 away from car lane edge is 7 ton/km2 and prevention measure is required.

124. Other than at along road, air can be polluted at the locations of asphalt/concrete batching plants, rock crushing plant, soil/rock borrow pits, material stock piles by their activities such as mixing of aggregate, crushing stones, sieving sand, heating bitumen, excavation of soil/rock etc., although these shall be located sufficiently away from settlements.

125. Concentration of NO2 during construction is an issue as stated earlier. NO2 during construction was estimated vs distance from road, taking into account of equipment, trucks and public traffic, using safety side assumption, and plotted versus distance from the edge of car lane as Figure 5. In the figure, NO2 concentration, in case of noise barrier (also effective to air pollution) is constructed, is also plotted.

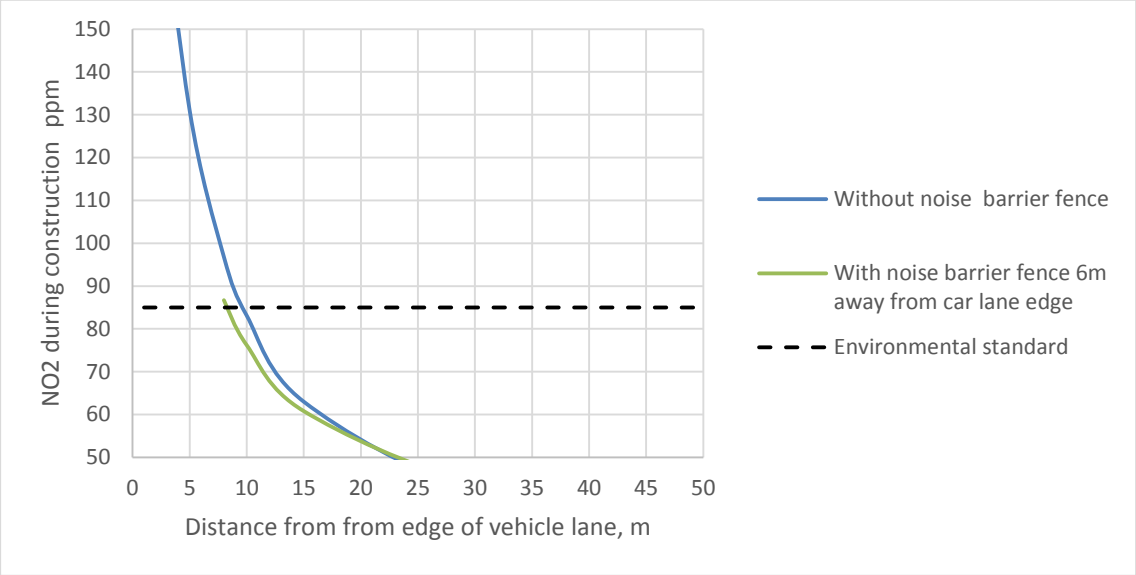


Figure 5: Simulation of NO2 concentration during Construction with/without Mitigation

As shown in the above, concentration of NO2 is not accepted within the area closer than 10m from the edge of the car lane during construction (only when heavy equipment is working in front of the receptor) if no mitigation measure is taken. To mitigate this, it is recommended to install a barrier wall/sheet with a minimum height of 3m at the location 6m away from the edge of the car lane only when during heavy equipment is working in front of the receptor buildings so that the concentration of NO2 is reduced to allowable level. In addition to this, regular maintenance of equipment/truck, no idling, attaching muffler are minimum requirement as a common construction practice

Noise Impact

126. Noise level is different depending on the distance, as well as air pollution, between the receptor and source of noise(vehicle), type (truck or sedan) of the vehicle, traveling speed, number of passing vehicles, background level, weather conditions, etc. Considering all of these factors, noise level vs distance from edge of car lane, depending on the vehicle speed, using the vehicle numbers after operation in the year of 2030 when largest no. of vehicles is travelling, was estimated as Figure 5.

From the experience of implementation of the road rehabilitation projects in other areas, if used a vibratory rollers without vibration and apply measures for dust suppression on the effects of excess in the area of sensitive receptors, noise and pollutant concentrations in the ambient air are not marked. In this regard, plastic protective barriers are applied in case of excess of the actual parameter data.

The cost for the noise barrier is reflected in Table 23.

If necessary, at the discretion of the construction supervision Consultant can be made more monitoring points near sensitive receptors.

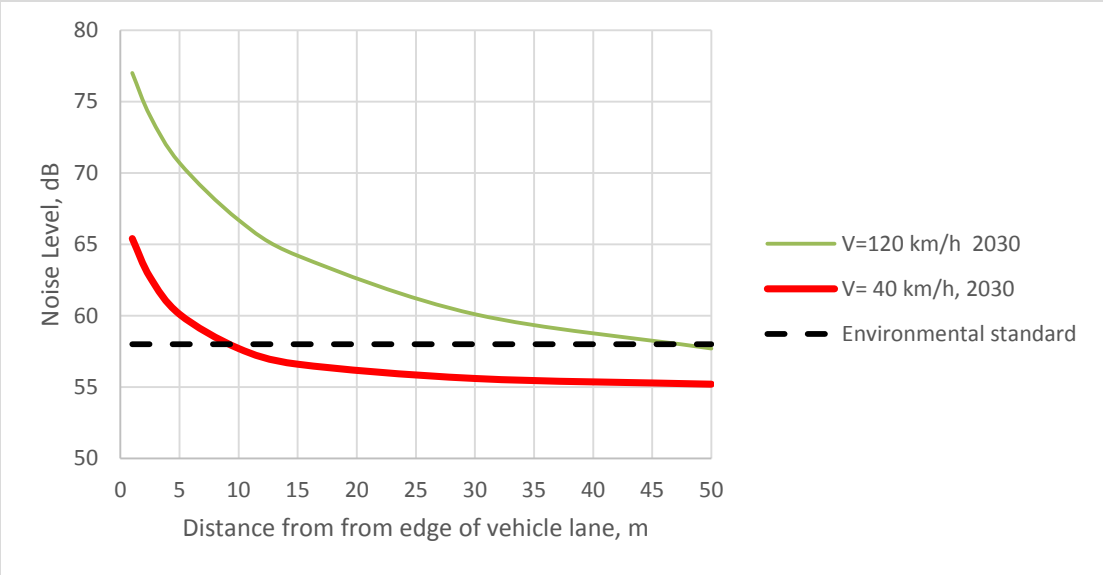


Figure 6: Simulation of Traffic Noise Level depending on Vehicle Speed

Noise level allowed for residential area is 55-60 dB in KR guideline while World Bank specifies 55 dB only (or background +3 dB). In the above figure, an allowable level of 58 dB were chosen, based on more strict guidelines of World Bank than as of KR, considering the actual background level of 55 dB as monitored. As shown in the above figure, noise level predicted is always greater than allowable limit of 58 dB until 45m from the edge of car lane when the vehicle driving with speed of 120 km/h of design speed while it is almost less than the limit when the vehicle be driving with 40 km/h. Therefore, the mitigation measure to be proposed during operation is to limit the traveling speed of vehicles less than 40 km/h only for residential/sensitive areas.

Next figure is the simulation of noise levels until 2030 using driving speed of 100 km/h for references.

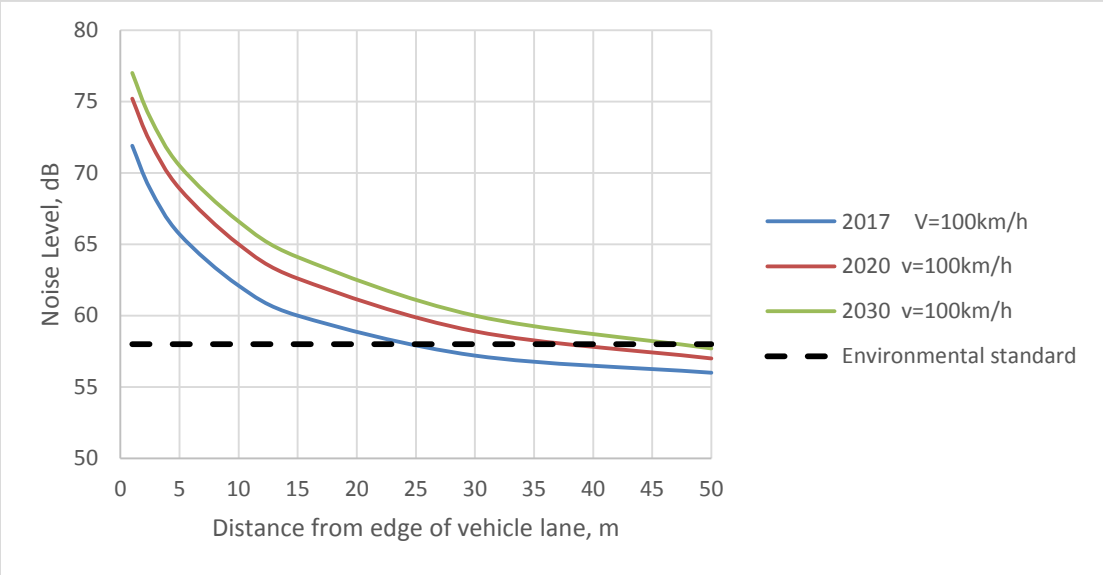


Figure 7: Simulation of Traffic Noise Level depending on the Year

Grow of vehicle number is assumed 4% each year for safe side. Similarly, traffic noise level is a serious issue at least until 2030 as well if the vehicles drive around with this design speed.

Within the period of construction works, sources of non-continuous noise are running engines of construction and road-building machinery. Sound is expected to generate at the construction site upon operation of construction equipment, delivering of building materials, digging of trenches and pits, removal and delivery of soil etc. In this project, an environmental standard of noise during construction was set, as per the guidelines of Word Bank, as 70 dB during day time of short time compaction period. No construction work is proposed at the nigh time.

127. Along the road, noise levels vs distance during construction in 2017 was simulated assuming typical construction work sequence with highest power level reasonably applicable, together with the case of installation of noise barrier as mitigation measures, as in Figure 8.

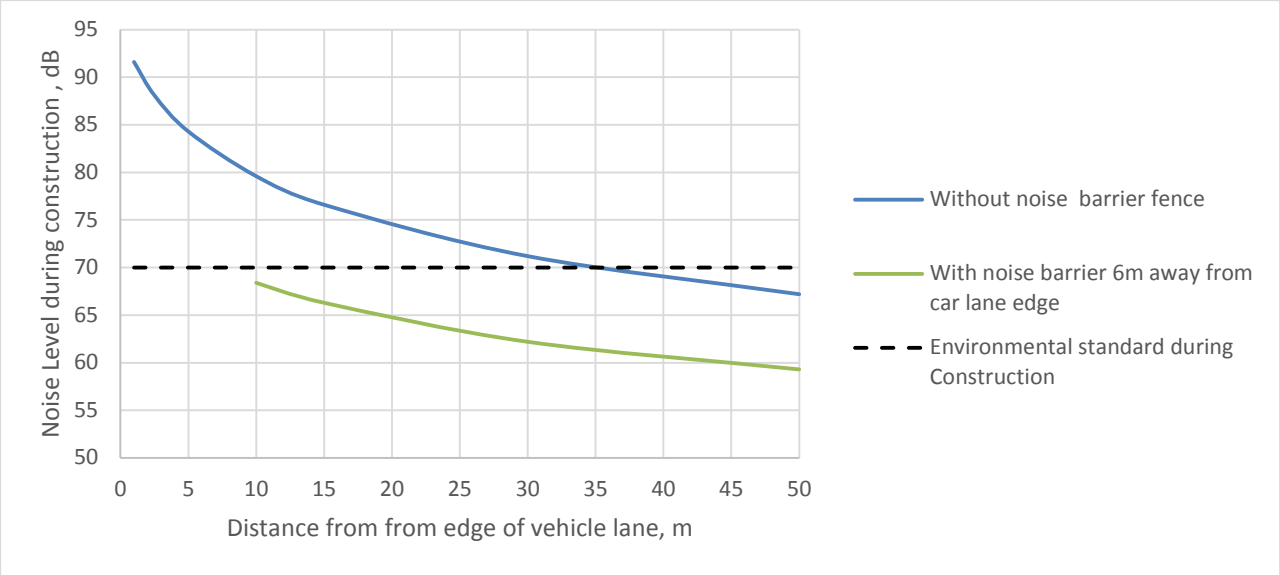


Figure 8: Simulation of Noise during Construction with/without Mitigation Measures

As shown in the figure, following can be concluded:

a. The construction noise level is estimated to exceed the proposed environmental standard set for during construction, until the location of distance 35m from the edge of car lane, within which, there are residential houses/ sensitive receptors (school) in the villages and residents/ students there may be annoyed by these high level noises during construction.
b. Generally, the primary source of construction noise is of embankment compaction machine at operation and, secondary, of dump tracks and of existing public traffic.
c. Therefore, the most effective mitigation measure is to suppress the transmission of noise from the main noise source, compaction machine, to the receptors only at the moment of compaction machine being operated in front of the residential houses/sensitive receptors.
d. To achieve this, tentative installation of a noise barrier at the distance 6m away from the car lane only at the time of compaction activity among all construction activities. The noise barrier can be a 3m high plastic sheet wall, supported by the frame of scaffold pipes. This wall can be easily removable and the cost shall be minimal.
e. Locations of possible residential house/sensitive receptors are:
   (i) Jumgal village (km129+400) – near the school along the road, LHS;

(ii) Kuruchuk village (km144+000) – near the Azamat shop, RHS;
(iii) Tulgo Say village (km151+000) – near the shop of Kutman, LHS
(iv) Bashkugandy village (km 159+000) – near the school adjacent to the road, RHS

f. As a practical procedure for installation of plastic sheet wall, (1) the actual relationship of noise levels of compaction machine versus distances to the receptors shall be established by monitoring at the site, (2) distances of the sensitive receptors shall be identified in each village, (3) noise levels at each receptors estimated based on the actual noise vs distance curve, and (4) a plastic sheet shall be held along the road if the noise level exceeds 70dB during compaction activity in from of the receptors. The noise barrier is removed away right to next location after embankment compaction there.
g. Those who are stationed at the stretch between car lane and barrier, such as street vendors and (illegally ROW encroaching) kiosk shop keepers, if any, are advised to move out there only when construction equipment (dozer or compactor) is working just in front of them and the noise is not endurable for them. Number of this Kiosk is very less. Thus, although the construction noise level is moderate, it is mitigatable.

Other than along the road, noise from batching plants/crushing plants and borrow pits can be the issue. They are supposed to be located at isolated area away from human settlement as per SSEMP.

Vibration

128. Vibration levels were monitored place to place in Feasibility Study Stage and the results were in the range of 90-95dB (acceptable level is 108 dB), as is so high level already, and no vibration higher than this level is estimated in construction activity except blasting. Thus, no special attention/measure is required other than routine environmental protection procedure, such as equipment maintenance, no idling, restriction of operation hours, etc.

Blasting

129. Blasting is planned to remove relatively fresh rock mass from the hill along road. The total volume is estimated as 128,660m3 at the chainage km 113.This blasting work causes a serious noise, vibration and dust pollution around.

Surface Water Quality

130. During construction period, surface waters may be polluted due to discharging of production and domestic wastewater, flowing of chemical and mechanical pollutants from the road into water. Some pollution of surface water may result from spills of fuel and lubricants from equipment and containers to streams by washing. It may also be polluted during construction and reconstruction of bridges.

131. Out of common pollutants of water bodies, the biggest concern may cause penetration oil productions into water. First signs as individual colored spots appear already when upon spilling of 4 ml/m2. Maximum permissible concentration for oil and oil products is 0.1 mg/l - 0.3 mg/l (according to Kyrgyz standards). To prevent contamination of surface and groundwater, it is necessary to provide mitigation measures, which will be described in the Environmental Management Plan (EMP).

132. During the construction period, water bodies will be affected upon repair, widening 1

bridge Tugol-Sai watercourse (149 км+600) and 113 culverts will be replaced. This impact will be expressed in possible contamination by soil, remaining parts of pipes, concrete headwalls, oil products, oils and by debris. During operation period surface water will not be polluted, except for extraordinary emergencies.

Contamination

133. During the construction period, asset of work processes associated with construction of roadbed usually causes the greatest damage to environment. Soil contamination is first observed on lands temporarily used as borrow pit, construction site as well as on the road being reconstructed. Soil might be also contaminated by installation and operation of asphalt concrete mixing plant. Soil is mainly contaminated due to precipitation of solid and fine silt fractions of particles to pavement from air. Such particles are brought by car wheels from roads and driveways with unimproved pavement, partial loss of transported loose goods, tire and pavement abrasion, as well as by toxic components of exhaust gases of cars. Soil might be contaminated by POL coming from construction equipment. It is assumed that this effect will be minimal and take place only within the roadside. Such impact might be reduced, if machinery is maintained in good condition by proper disposing of used oil.

Erosion of Embankment

134. Most of soil embankment shall be slightly eroded in the roadside due to road reconstruction, since major work is executed on the existing road with protective works in the drainage system. During the construction period, impact will be expressed in the form of loss of topsoil in areas adjacent to the road, garbage, spills of oil products and oils.

Description	Unit	Quantity
Excavation of top soil (vegetative layer)	m3	282,800
Excavation to spoil of unsuitable and surplus material, common soil	m3	576,400
Excavation to spoil of unsuitable and surplus material, rocky ground	m3	84,500.00
Formation of embankment, common material from cut	m3	300,200
Provision of Subgrade, selected material	m3	128,800

During the operation period, the soil will be contaminated by engines exhaust emissions containing lead compounds. When the engines of vehicles in the air with gaseous components enter the aerosol and fines, including the lead compound and carbon (soot) make up the bulk. The greatest danger to the environment is lead compounds formed during operation of the combustion engine. It is well known that the risk of accumulation of lead compounds in the soil due to the availability of its plants and the transition on the links in the food chain of animals, birds and humans.
These compounds accumulate in the soil at a depth of arable layer or depth filtration rainfall

High Embankment Filling and High Slope Cutting

135. Large embankment filling, higher than 10m and wider than 40m, is schedule for short-cut road construction in mountainous area around km 110 as shown in Annex A2. As for slope cutting,15m high slope cutting is proposed for the enlargement existing road or to improve the linearity of road alignment in several locations. Possibility of landslide, collapse, circle slipping of

these slopes are in concern.

Impact of Reconstruction of Culverts

136. Upgrading of existing culvert is one of the scope of the project. There are 101 small road crossing culverts as summarized in Annex A3. Their roles are quite important to ensure the local irrigation system for agricultural land and drainage system in the settlements area. Due to recent increase of demand from agricultural area, the importance of these drainage system has been increased. It is necessary to upgrading the capacities of these drainage system to meet the today's demand. However, to replace/upgrade these outdated culverts, many debris of concrete/metal wastes can be generated at demolishing them. Treatment of these debris is an environmental issue.

Impact to Existing Powerline/Pylons

137. Powerlines are running along and, sometimes crossing the road overhead as summarized in Annex A4. It was noted that some pylons are located in the road rehabilitated range inside the ROW, and have to be moved out. Even if outside of ROW, some pylons that are erected on the hill, where the foot of the hill is designed to be cut carelessly for road enlargement, then the stability of remained slope are risked to collapse, together with pylons on the remained slope.

Groundwater Contamination

138. Groundwater is vulnerable to the oil pollution. Gasoline/diesel can percolate through soil into groundwater more easily than water if oil has been leak on the ground surface. Once groundwater has been polluted by gasoline for example, gasoline persists there almost very long time and, for the worse, the contaminated plume expands to the direction of groundwater flow. Simulation of expansion of the contamination plumes presented in Figure 9 as per ASTM E1735 Standard Guide for Risk-based Corrective Action at Petroleum Released Site.

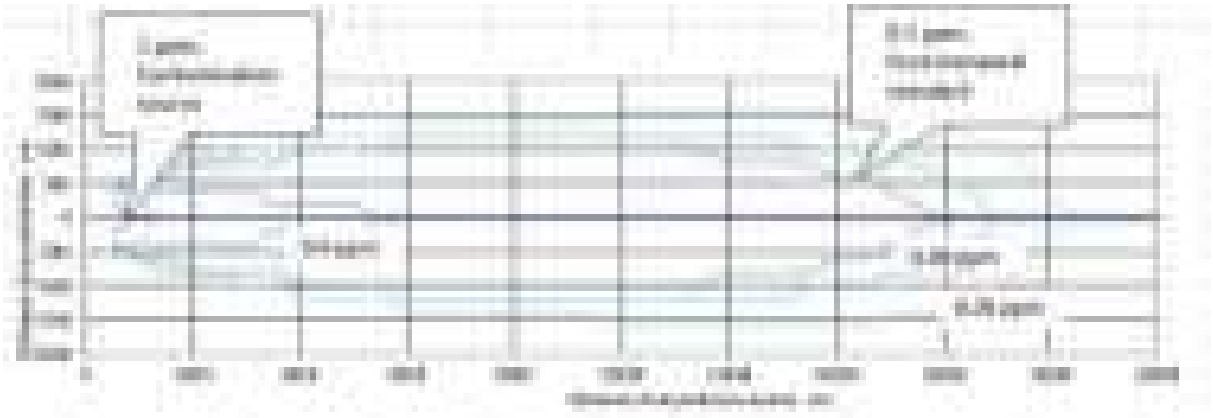


Figure 9: Simulation of Gasoline Contaminated Plumes in Groundwater

Above was simulated assuming groundwater has been contaminated as 1 ppm only spilled location and groundwater flows 0.5m/day after 1 year of contamination. As shown in the figure, although the groundwater at the source of contamination is 1 ppm only, contamination plume of groundwater, greater than 0.1 ppm of KR standard, expands as far as 150m from the source. In another word, hand pump well water cannot be use for drinking until 150m from the source at least. Again, it is emphasized that, although the contamination of groundwater as 1ppm (1cc gasoline per 1m3 water) seems nothing, the influence is disastrous. Any percolation of gasoline into ground shall be prevented first of all.

Flora and Fauna

139. During the construction period, reconstruction of road may cause insignificant impact on flora and fauna due to accident going of construction machinery beyond the construction site. There might be observed the following factors as well:

a. Factors that prevent natural migration of species to temporary and permanent habitats, exchange of gene pool, reproduction, etc. They are road construction elements - slopes, embankments, excavation, grade, fence and roadbed.
b. Anxiety factors that frighten animals and violate their habitat are noise, vibration, light from the traffic flow. As we know animal's reaction to disturbance factor may differ according to species. Collision with oncoming traffic can cause death of fauna representatives on roads. All these factors lead to decrease in number of populations.

140. Given that the road had existed for a long time before reconstruction, established way of wildlife habitation in adjacent territory, we can assume little additional impact on flora and fauna, which will be caused by road reconstruction. Within the alignment, there are considerable trees that will be affected. In the preliminary assessment, the estimated number of trees to be affected is 100. Impact on flora and fauna will be minor during operation period.

Social environment

141. During construction, although the most dangerous type of transport pollution is emission of exhaust gases into air and other types of energy loss: noise, vibration, electromagnetic radiation, they are mostly mitigatable. When mitigation activities are properly carried out, this negative impact will be reduced. Impact of construction process will last for relatively short time, though there may occur accidents due to the poor state of the road. In general, the effect on the social environment of the road reconstruction project will only be positive. During construction period, there will be created many jobs, particularly for local residents, who can participate in reconstruction of the road. Construction of the road shall radically improve movement conditions, travel time on the road and increase road safety. This, in turn, shall result in improvement of social situation of population in the project area. During operation period, despite existing negative impacts of the road on the human habitat, flora and fauna, the road has well-defined value in socioeconomic development of society and livelihoods of population. With improvement of transport - operating characteristics of the road due to its rehabilitation, the quality of services to public will be significantly improved. During operation period, the given impact will not take place.

Cultural and historical sites

142. During construction, the impacts to cultural sites will be in the form of physical abuse only. Vibration from operating machinery is estimated as less than present high level of 90 dB(A) and no impact is predicted by the operation. Physical disturbance of these sites is by construction workers only. During construction the impact to the following objects below.
Cemeteries:

a. 158 – 160 km Cemetery on the (LHS), around 6 m from the road.
b. 153 km -155 km Cemetery (RHS) on a hill 20-50 m away from the road.

c. 152 +300 km Cemeteries on the both sides for Tugol-Say village. The distance between the boundaries of the two cemeteries, 25m; width of the existing road 13.4m. From the border of the cemetery (RHS) to the road 3 m; opposite side (LHS) 3-5 m.
d. 141 km +300 Cemetery on the left side (LHS) of the road, 10-15 m from the road.
e. 138 km Complex mausoleums - Clay mounds both sides. Located close to the road on the right (RHS) (3-3,5 m) and approximately 100 meters to the left (LHS).
f. 132 km Cemetery on the LHS located around road 20-30m from the road.
g. 131 km Cemeteries on the both sides, RHS - 3 m, LHS - 3.5 km from the road.

Traffic Safety

143. During construction period, construction and road building machinery shall influence on traffic resulting in impeded movement, possible crowding of cars and machinery, violation of traffic rules and possible emergencies. In order to prevent such situations, we need to provide for mitigation measures to regulate traffic.
During operation period, the impact by traffic will be minimal due to arrangement of road signs and markings.

LARP, Social Issues

144. The project is rehabilitation of existing road and basically all the permanent works are done within the ROW that is the government. Occupancy activities of government land, such as building kiosk/residence/fence or planting trees or agricultural use inside government land without permission of government, is not allowed and occupants are supposed to be go out/stop occupation without any compensation according to the laws of all over countries including KR. However, based on the ADB safeguard Policy, compensation is paid to all illegal state land owners.

145. During construction period, persons, who sell and plots will be covered by road extension, will be subjected to impact. Fences of private persons, lands of municipal areas, business facilities and government organizations might be affected. By the time such impact may be temporary or permanent relocation. The impact will be reduced due to developed plan of resettlement and economic displacement. Below is a table of the LARP report, which shows the number of people, exposed to resettlement. Affected people will work with compensatory mechanism, according to LARP plan.

Table 17: Summary of project impact magnitude according to the geographical location and types of impact

No	Village	TOTAL Affected land parcels	AHs	Vulnerable	Severely affected	Total affected perennials	No of affected fruit - trees	No of non-fruit trees	Municipality	Homestead	Parcels w/t affected fence/walls	Affected Movable Kiosk	Affected Operating Business	Affected Non-operating Business
1	Jumgal	35	34	15	0	303	13	290	3	32	32	2	2	2
2	Kuiruchuk	12	12	6	1	89	0	89	1	11	7	0	3	0
3	Tugol-Sai	3	2	1	0	0	0	0	0	3	3	0	0	0
	Total	50	48	22	1	392	13	379	4	46	42	2	5	2

There will be no impact during the operation period.

Construction camps

146. During construction period, construction camps will be established outside the territory of villages. Works schedule will be controlled in camp sites. There may be formed of solid domestic waste, bad housekeeping, soil contamination may take place, local flora and fauna might be impacted on the territory and thereby cause concern of local population. The Environmental Management Plan includes measures focused on mitigation of such impact. During operation period, this issue is not considered.

2. Mitigation measures

2.1 Pre-Construction and Design Phase

147. The Pre-construction and Detailed Design Phase covers the period when the Design Consultant accepts the design work up to finalization of the Tender Documents and prior to the engagement of the contractor for the actual construction. The engineering designs shall include all the necessary work relevant to detailed site surveys, design computations, technical drawings, environmental and social requirements, technical specifications and tender documents. This will be followed by Tendering process from which the Client/Employer shall decide on the Contractor for the civil works.

148. Avoidance of impacts can be executed by proper planning/preparation during the pre-engineering and design phase. Contract documents should include clauses be formed based on the IEEs and EMPs of the project and communicated with sufficient emphasis to the Contractor. A number of these impacts are discussed below and reflected appropriately in the EMP.

149. During the pre-construction and detailed engineering phase, the design engineers should be guided on a number of items need to be considered in the production of road and bridge designs, and which will have relevance to the environmental aspects of the project. These items are as follows:

a. To minimize the impacts of air pollution and noise during construction, required is the designing of tentative installation of plastic sheet noise barrier (also effective to air pollution) between the area, where compaction equipment is working, and the sensitive receptors such as residential houses, hospital, school etc only at the time of embankment compaction activity. Water spraying plan for unpaved road, material stock pile and borrow pit shall be established.
b. To prevent the contamination of groundwater by oils, the first priority attention shall be paid when designing of bitumen storage and refuel tank area since such area always cause leaking of oil product into ground. Bitumen tank and refuel area shall be concrete paved without crack and, once leaked, they have to be immediately wiped out before percolating into ground. Oil tank is erected on concrete floor surrounded by concrete berm.
c. To minimize impacts of erosion, side slopes of embankments will be designed to reflect soil strength and other considerations as included in the project specifications in order to reduce slips or erosion; for embankment greater than 6m, stepped embankments will be used. Use of “green measures”, such as planting native vegetation will be a favored mitigation approach with thin (10-20cm) cohesive soil layer over the surface of slope or any naked soil portion of embankment.

d. Formation of high slope (cut or fill) shall be properly designed, not to cause landslide, slipping, collapse etc. with sufficient safety factor as required.
e. For the replacement/upgrading of existing outdated capacity culverts, many concrete waste/spoil can be generated and they have to be properly dumped/reused.
f. Powerlines are running along and, sometimes crossing road overhead. Attention shall be paid at designing road to minimize the impact to these powerlines/pylons when they very closely located to the road.
g. For geology and seismic conditions, cuts on the mountain and hillsides should be stable or be reinforced; earthquake loading shall be applied to the design of structures, to ensure that seismic events do not have negative impacts during the operational phase of the Project.
h. On Flora and fauna – The Design Engineers should provide guideline in the design for the Contractor to ensure that his ancillary facilities such as asphalt plants, construction camps and others are properly sited to protect indigenous flora and fauna. The Contractor should be instructed to avoid loss of trees, wherever possible, and should employ techniques such as asymmetrical widening. Where trees must be felled, the Contractor should be instructed that each tree removed should be replaced by at least two new saplings of the same or similar species and be planted at suitable locations, or as designated by the tree owner.
i. On cultural and historical sites – The Design Engineers should provide guideline in the design for the Contractor to follow common practices (proper control of workers and equipment) during construction works with minimal or no impact to any cultural and historical structures along the road. In the project design, include installation of physical cordons around identified sites to minimize construction impact and alert workers/people from disturbing cultural and historical sites. Conduct visual observation of the objects in cemeteries and mausoleums to document their state before the construction works jointly with MoCIT KR and local authorities.
j. Health and Safety – The Contractor shall be provided guidelines in the design or in the Technical Specifications to ensure that traffic safety issues shall be responded to during the construction phase of the Project, including incorporation of: (a) Safety barriers; (b) Traffic signs; (c) Road crossings; (d) Speed bumps; and (e) Speed limits.

150. **Uncontrolled Establishment of Material Sites** - This situation will be avoided by requiring the Contractor to follow the mandatory steps in establishment of material sites as defined by KR Regulation, specifically to acquire all required permits material sites from local authorities, get approval from regional departments of SAEPF under the Government of KR, prepare a “Quarry or Borrow Pits Development and Restoration Plan”. All of these relevant documents should be submitted to IPIG-MOTR of KR for the purpose of securing a license to extract materials from the State Agency for Geology and Mineral Resources.

151. **Unmanaged waste asphalt-concrete temporary storage and processing areas** – Old asphalt pavement will be removed and be replaced in the new pavement. Storage or stockpile areas of old asphalt should be situated where they pose no risk of contamination to the environment. In coordination with local authorities, location of old asphalt stockpile areas will be identified, with a minimal distance of 500m from any settlement. Preferably, storage areas should be in state-owned land. If private lands will be used, a negotiated rent on the property should be established with the land owner. All temporary asphalt pavement storage and processing areas

shall be agreed upon with the regional departments of SAEPF of KR under the Government of KR. Old asphalt should be trucked away in blocks and stockpiles should be no higher than 2.5 m.

152. There are two ways of using old asphalt:

a. The transfer of old asphalt to Local RMU of MOTR for up filling of the secondary roads;
b. Use the old asphalt to strengthen the top coating of the road shoulders by adding the gravel-sand mixture with 15cm thickness.

153. **Establishment of Asphalt and Concrete batch plants** – Due to the noise and emissions, batch plants for the pavement should be installed with a minimum distance of 500m to residential areas. Should aggregate crushing be adjacent to the batch plants, dust suppression equipment (standard on most modern crushers) will need to be installed on the crushing unit. The effectiveness of treatment should be regularly checked. The entire process of establishing a plant will be controlled by SanPiN 2.2.1/2.1.1 Design, construction, reconstruction and operations of enterprises; planning and construction of residential sites/ and Sanitary-hygienic zones and sanitary classification of enterprises, structures and other facilities" and Sanitary-epidemiological rules and standards. SanPiN 2.2.1/2.1.1.006-03.

154. **Material Transport Route Plan** – Estimates from the preliminary design for the section show that 690,000 cubic meters will be the cut volume and 600,400 cubic meters for fill volume for the road section. Truck traffic will considerably impact local roads as well as the communities they traverse. Haul routes should be planned with CSC with sufficient maintenance to minimize dust, noise generation and disturbance to residents by restricting the hauling time between 07:00 and 18:00. For Quarry site, the most probable sites are along Jumgal River. As for borrow soil, 7 borrow pits were identified, including natural slopes beside road, are presented in Annex A4.

155. **Environmental Safeguard Training** - CSC will designate his own environmental specialist for the implementation of EMPs and monitoring compliance with environmental clauses contained in the contract specifications. Correspondingly, the Contractor will do the same. Preferably during the early part of the construction, the CSC will provide sufficient briefing seminar on EMP implementation and compliance monitoring for the CSC's inspectors as well as the contractor. Such seminar should be conceptualized during the design phase.

156. Along the rehabilitation segments of the Section "Epkin (Km 89) to Bashkugandy (km 159)," the expected main ecological impacts at the design phase of the project relate to minimizing the loss of trees along the road sections. Impacts on the ecological environment are minimal since the project activities will be mainly located on the existing road corridor.

157. **Surface Water contamination** can occur in Tugol-Say (148+874) river and other streams crossing the road. The design engineer should consider the imminent contamination issue during construction of bridge and road segment at these points. Special measures and technical specifications are clearly stipulated to eliminate any adverse water quality impacts. Construction methodology from the Contractor should incorporate measures to prevent and to mitigate water contamination during construction. Although, there are no special protected areas or biodiversity hotspot within 500m on either side of the alignment for its entire length, the river bank and the pond can be considered as ecologically relevant sites which warrant special consideration. The design engineers should take these items into consideration in finalization of

the designs.

158. **Tree Management Plan** – Within the alignment, there are considerable trees that will be affected. In the preliminary assessment, the estimated number of trees to be affected is 130. The inevitable cutting of trees will be compensated by new plantings. Tree planting should be implemented after the completion of the technical work on a separate section of the road (do not wait for the full completion of construction) in the spring (March to April), and / or autumn (September to October), when the trees have a great chance to settle down. A replacement ratio of 1:2 is recommended to ensure that the tree replacement rate does not fall below the number to be replaced. Trees should be planted in those areas where there was a tree cutting, considering the following parameters: the height not less than 1.75 m, age - 5-7 years, the distance between the free-standing trees - 6-8 m, species of trees - walnut, maple box elder, elm, white poplar, willow white, white locust. It is necessary to pay attention to ensure the landing of the "right trees in the right places," such as small trees should be planted under the communication lines, thus reducing the need for bulk cutting tree limbs in the future, etc. The CSC shall produce the plan with IPIG-MOTR. Areas for replanting shall be decided with IPIG-MOTR and the local officials. The cost for replanting can be part of the project to be implemented by the Contractor during the construction period to ensure that plant care will be provided. Since the target will be survivability of the trees, payment can be contingent to the number of trees that will survive within the contract period.

An additional potential impact on trees may include soil compaction at the roots of trees, changes in land levels around the trees (more than 30 cm), cover the soil around the trees with waterproof material, emissions of toxic materials for the trees, or physical damage to the root system. The negative impact of trees can be minimized if refrain from storing construction material and other heavy equipment that can seal the soil near the roots, using only the trunks near the organic material for the potential of filling or enclosing the area around the trees during construction work near the trees.

159. **Maintenance of Access during construction** – Construction of bridges and culverts over water necessitates detour roads to be temporarily arranged. In so doing, normal traffic will be impaired and cause access issues to motorists. In addition, these detour roads need to be maintained for connectivity and safety purposes. Traffic plan incorporating these detour roads should be formulated by the contractor. During the design stage, the designers should also anticipate the need for detour and to include this issue as part of the work requirements. Adequate local assessment and consultation should be done in order to avoid this particular social issue during the actual construction.

160. **Livestock and Pedestrian Crossings** – Since the road section traverses residential areas, farmlands and pasture grounds, the need to provide pedestrian and livestock crossing becomes important. Category II Road allows design speed of 120 km/hour in flat terrain (100kph in cross-country and 60 kph in mountainous terrain) for vehicular traffic, such that crossing people (especially children) and livestock (sheep, cattle, horses, etc.) pose real danger. The design should identify spots/location of these frequent road crossings in coordination with the local residents. Sign boards, road hump, crossing mark etc. shall be designed adequately. The crossing of people in the residential areas will be installed through every 200-250 m.

161. **Bus Stops** – With the improvement of the road, it is anticipated that bus traffic, especially by the mini-buses (marshrutka) will increase. With the new road, for safety purposes, designated bus/transport stops will have to be decided in the detailed design. This required sufficient

discussion with MOTR and the local community. On the designed section 16 bus stops are provided along the road. Bus stops will be mainly deployed on existing locations. However, if the bus stop is only on one side, the new stop will be located on the opposite side. The coating on the bus stations is the same as that on the main road for ease of construction.

162. **Public Toilets** – There is only one public toilet at this section of the road at km 111, which will be demolished due to new road alignment. It is required to construct new public toilet, and the place and construction design has to be agreed with specialist.

163. **Adjacent roads -** Along the road there are a lot of joints, where secondary roads are connected to the project road. These junctions usually are not marked and signed indicating where the road leads. However, it is abutting a secondary road should be provided with proper markings and road signs for the safety of road users. There are a few well-defined major transport junctions and which are intended to achieve a relatively high speed for vehicles entering and traveling along the road adjacent to the project road. The resulting relatively large radii are used in these compounds, which cause large islets of safety and a large area for the entire junctions, which subsequently lead to reduced visibility and road safety. This basic contiguity must be verified with respect to road safety during the detailed design and, if appropriate, reworked to ensure an adequate level of security.

164. **Cultural and historical sites -** The objects of historical and cultural heritage are the objects of study and protection of the Ministry of Culture and Tourism of the Kyrgyz Republic (MoCIT KR). To prevent exposure to these objects it is necessary to develop Management plan for cultural and historical sites, according to the law protection zone of objects is not less than 50m. Therefore, all questions related to the establishment of protection zones, procedures, management plans should be coordinated with MoCIT KR and local government. On the basis of the findings of Archaeological Study (Appendix F), during the detailed design stage, Consultant should send the road design along with the Management plan for objects of cultural heritage for MoCIT KR approval. Conduct visual observation of the objects in cemeteries and mausoleums to document their state before the construction works jointly with MoCIT KR and local authorities.

2.2. Construction Phase

165. A specific environmental section shall be included within the main Bid Documents indicating that the Contractor shall be responsible for conforming to the requirements of the EMP. As such this EMP shall be included as an annex to the Contract Bid Documents.

166. Under the guidance of CSC, the contractor will have to submit site-specific Environmental Management Plans (SSEMP) for the following prior to commencing operations: (i) SSEMP in the sensitive sites such as main residential and commercial areas, cultural and historical sites including cemeteries, riverbanks or other waterways; (ii) layout of the work camp with sewage management and waste management plan; (iii) sitting and description asphalt and crushing plants, equipment maintenance and storage facilities; (iv) spoil soil management plan; (v) borrow site management including restoration; and (vi) method statement for bridge reconstruction works. The SSEMPs shall be endorsed by the construction supervision consultant before submission to IPIG for approval. The SSEMP shall then be updated from time-to-time to incorporate any changes in the field conditions while construction will be in progress.

167. The SSEMP should also contain the following Annexure:

a. Cultural & Historical sites Management Plan.
b. Construction Noise Suppression Plan
c. Dust Suppression Plan

d. Camp and Workshop Management Plan
e. Solid and Liquid Waste Management Plan
f. Borrow Pits Management Plan
g. Material Processing Plants/Equipment and Storage Facilities
h. High Slope Protection Plan
i. Spoil Soil Management Plant
j. Material Source Management and Reinstatement Plan
k. Method Statement for Bridge Construction

168. The typical construction process will entail, first the closure or restriction of existing traffic at the work sites and establishment of detour road. The provision of the new detour road will entail, stripping and clearing of vegetation, excavation, filling and leveling of the area, provision of embankment fill and necessary surfacing for the existing traffic.

169. Road widening will entail earthwork and breaking of rocks, which need to be hauled to some designated stockpiles. These works by themselves disturb the natural surroundings, and affect vegetation. It is important that measures for proper maintenance of the detour road be established to respond to traffic and community safety, control of dust, noise and emissions. Replanting of affected trees should be done as soon as possible and schemes for detour roads and soil stockpiles should favor tree preservations. Waterways should be respected and contamination should be prevented.

170. **The succeeding stages would entail demolition of existing pavement and bridges**. This will involve scarifying old pavement structure, and earthworks to conform to design requirements. For the bridges, it will be breaking the structures at the existing connections and removal of deck and girder elements by use of heavy equipment. These old bridge components will be placed in designated areas, which will not impact the natural environment, impede traffic and cause safety concerns to the general public. The bridge abutments and underlying foundations will be excavated and removed to give way for replacement structures. This breaking, demolition and removal of old elements will generate considerable noise and dust and chunks of debris will drop into the existing waterway. To minimize the risk of water contamination, the demolition and construction activities will be highly advisable in the summer months.

171. **The succeeding steps will involve construction of the new pavement and bridges**. The pavement construction will entail embankment filling, subbase, base course and asphalt pavement layer construction. In the end the final wearing course will be laid along all throughout from the existing road, onto the approach roads, and onto the deck slab in such a manner to have smooth layer of road and bridge pavement. Embankment works will entail transport of approved fill materials from borrow pits or from cuts if found to be suitable. The suitable materials for subbase and base course will come from quarries or borrow pits of approved properties. These pavement substructures will be engineered and compacted to desired degrees with the use of graders, and compactors in accordance with designs and specifications. The asphalt pavement layers will be provided by asphalt plants with crushed stones and rocks for the aggregate requirements. It will be the responsibility of the Contractor that asphalt plant would produce the necessary required bituminous mix in conformance to environmental requirements for asphalt plant siting and operations.

172. **The bridge construction** will start with the substructure such as the foundation systems and piers. This will be followed by the superstructure elements of girders, deck slab and railing. The construction of the superstructure components such as the girder and deck slab will involve installation of formworks, casting of concrete and in some instances, post tensioning of tendons

when necessary. The important guideline to be brought forward is the use of precast elements to minimize pouring and casting of superstructure elements over water to minimize contamination. Concrete batch plants will provide the necessary concrete for these structural elements from approved sites with operational guidelines in accordance with environmental protocols and industry standards.

173. For the Section Epkin (Km 89) to Bashkugandy (km 159), the primary relevant issues consist of air and noise emissions, proper management of earthworks, waste materials and contractor good-housekeeping practices associated with fuel and lubricant management, work camp waste disposal, and occupation health and safety practices for the contractor's workforce. The following is a discussion of highlights of the details provided in the EMP.

174. **Air quality impacts** are expected to be generated by construction activities, such as, construction machinery exhausts, emissions from asphalt plants, dry exposed soils and material stockpiles, dust from haul roads and construction activities, as well as aggregate crushers, but will be temporary as the work progresses along the entire section of the road. Sensitive receptor sites within the villages of Jumgal, Kuyruchuk, Tugol-Say and Baskhugandy should be considered as areas of mitigation in terms of air quality, noise/vibration. Results of the periodic measurements should be used to monitor the level of impacts and corrective/mitigation measures be performed when these parameters exceed their allowable limits. Emissions can be minimized and controlled by proper and regular maintenance of equipment. Dust is controlled by regular water spraying on exposed areas. In addition to these common practices, noise barrier is effective to reduce the pollutants concentrations.

175. To reduce emission levels, the contractor must implement the following mitigating measures:

(i) technical maintenance of the construction equipment in good condition;
(ii) prevent idling, as much as possible, of engines by shutting off machineries not in use for more than 3 minutes;
(iii) prohibit use of machinery or equipment that cause excessive smoke emissions, using the construction machinery with low limit of emulsion.

176. **Noise.** Construction activities are expected to generate significant but temporary noises from various construction tools such as jack hammers and other similar machines that could produce noise of about 89-90 dBA at about 10 m from the work site. Plan for noise level measurement for such equipment versus distances and mitigation measures such as tentative installation of plastic sheet wall and/or limiting driving speed by road hump shall be submitted, together with equipment maintenance program. Sensitive receptors for noise include:

a. Jumgal village (km129+400) – near the school along the road, LHS;
b. Kuruchuk village (km144+000) – near the Azamat shop, RHS;
c. Tulgo Say village (km151+000) – near the shop of Kutman, LHS
d. Bashkugandy village (km 159+000) – near the school adjacent to the road, RHS

177. In areas identified as sensitive receptors, during the work of heavy construction equipment will take regular measurements of noise levels. During the period of work in these areas the contractor will use the method of staged rolling of the road bed with vibratory rollers without vibration mode.
In case of exceeding the permissible noise level, to minimize the impact, the noise barriers will be used. Installation of noise barriers will be considered as "extreme" measure. The cost of installing of the noise barrier is shown in Table 22.

178. Reducing the daily noise impact can be reduced by limiting the construction work from 07:00 AM to 18:30 PM in the urban areas, and from 06:00 AM to 19:00 PM in the settlements, located 500 meters from the venue works. For sensitive areas near the settlements established mandatory to comply with the threshold of the maximum noise level as 70 dBA. Monitoring of noise impact during the construction is carried out under the provisions of the SSEMP.

179. **Vibration** – According to the results of vibration monitoring, it was in the range of 90-95 dB that are considered very high levels already and, according to the experience/references, there is no such a high vibration. Vibration can be caused by conventional construction works except blasting. Also, vibration may occur from the operation of heavy construction equipment during the dismantling of the road surface, as well as the trucks entering and leaving the area of work, which create additional vibration at a distance of 6-8 meters from the roadway, but it will weaken over the next 10 m. The level of vibration generated by these mechanisms and assessed as very high vibration levels 90-95 dB on the basis of basic monitoring. Vibration monitoring is required under the EMP.

180. Therefore, vibration levels during construction has been assumed as less than existing (normal day level without construction work) level and, if so, no measures are supposed to be required for vibration mitigation. However conventional mitigation measures are to be taken as per KR regulation such as, use of vibration minimized equipment, limiting of working hours, good maintenance and monitoring, when construction work is implemented near the sensitive receptors.

181. **Blasting** – Blasting causes serious environmental impacts such as noise, vibration, dust, etc. The contractor shall prepare the blasting work application as per KR regulation and, after approved the authorities, implement blasting work strictly in accordance with the application.

182. **Surface water** – Several types of waterways are found to be crossed by the project road. These are either man-made such as irrigation canals and flood control ditches, as well as naturally occurring rivers. These waterways will become receptors of potential negative environmental impacts such as pollution from construction area runoff, and change in surface hydrology due to increased sediment load. Total quantity of culverts will be 101, and 1 bridge on Tugol-Say watercourse. In order to mitigate negative impacts on the waterways, the following must be implemented: (i) store stockpiles of topsoil and other such materials at a safe distance from surface waters; (ii) long term stockpiles must be covered with grass or other suitable coverings; (iii) create settlement ponds where construction activities are near natural waterways.

Unsustainable construction practices such as improper handling and storage of construction materials (e.g., concrete, asphalt, lubricants, fuels, and solvents etc.) can pose risk of contaminating the waterways crossed by the project road. Embankments and construction materials like fill, sand and gravel can be washed out by rainwater into watercourses during downpours. Oil and grease from leaks in engines can also accumulate in surface waters and should be properly controlled. To prevent these, appropriate mitigation measures must be taken such as (i) regular maintenance of all construction equipment, (ii) chemicals and oil must be properly stored into impermeable and bounded areas away from surface waters (not less than 50 m).

Within the section, the spot are Tugol-Say River and streams crossing the road. The Contractor should be extra careful in this spot as construction activities can directly contaminate the surface water and consequently affect the biological species in this area. Contamination should be avoided and disturbance to biota be minimized. Water quality measurements should be done during actual periods of construction at these sites.

183. During the construction of bridges construction site dimensions shall be the minimum necessary. Construction site should be placed at levels that exclude them flooding. The discharge of polluted water, landfills, parking cars and the construction of temporary facilities within the water protection zones on the river banks. Construction sites should provide capacity for the collection of sewage and garbage.

In the water protection zones (not less than 50 m) of rivers it prohibits contamination of the earth surface, including the garbage dump, waste generation, as well as parking, cleaning and repair of motor vehicles and road construction machinery, fueling. All works in water protection zones must be carried out based on the permission from the local authorities.

It is prohibited extraction of local building materials in the water protection zones without permits of environmental authorities.

The project documentation should include the restoration work after the bridge construction: the removal of the bed of the river banks, backfilled during the construction of supporting structures; cleaning of the river bed and the flood plain from cluttering of the objects, extracting and hauling piles of scaffolding and temporary supports; dismantling of temporary facilities on the construction site and land reclamation, including borrow area and access roads.

The environmental impacts associated with this work can be minimized if culverts are rebuilt properly, i.e., properly sized and with the correct slope and downstream erosion/scour protection measures applied. If possible culvert work should take place during the dry season, since otherwise temporary bypasses will be necessary. However, a number of culverts convey irrigation water, which flows, based on a prescribed irrigation schedule. Contractors will need to liaise closely with farmers to establish times when work can take place and not harm crop development. Nearly all structures will be concrete box culverts, precast, with each section set in place and sealed with a special commercially available gasket/sealant material.

184. **High Embankment Filling and High Slope Cutting** – Construction of these shall be implemented completely as per SSEMP with such as, erosion/scouring prevention system (drains and gabions if necessary), top soil over slope surface, steps for maintenance, full layer compaction (in case of embankment).

185. **Debris of old culver**t ― A total of 101 culverts are supposed to be demolished and replaced with high capacity ones. Contractor is required to properly treat/reuse these concrete/metal debris as per Site-Specific Waste Management Plan

186. **Powerline/Pylons** – They shall be relocated backward as per predetermined by SSEMP.

187. **Chemical and fuel** shall be properly stored without any chance of percolating into subsoil, by means of concrete floor with berm as per SSEMP. Refueling shall be in the same condition. Spill-emergency system shall be functioned.

188. **Disturbance of agricultural lands** can occur when trucks and equipment roll over them during construction activities. During construction, it can occur that equipment and trucks have to maneuver over agricultural lands and in so doing introduce compaction to these areas and render the soil unfit for agriculture. The Contractor should prevent these unnecessary disturbances on agricultural lands.

189. During site clearing and stripping, topsoil storage area should be identified. Mostly the

roadside corridor is frequently used as temporary storage areas. These stockpile soil should be protected against erosion. This will be done by, for example, seeding the stockpiles with fast growing shallow rooted grasses. To ensure proper embankment slope management the contractor will submit an embankment slope management checklist to commencing operation. This checklist will include a simple listing of measures for minimizing water and wind erosion losses. As long as topsoil stockpiles remain unused, the seeded grass cover will remain in place.

Borrow Areas - When planning to open a new borrow site, the contractor, within the purview of this IEE, should have the extraction permit, approval of a development plan, and later on approval of borrow pit restoration plan. The Contractor shall obtain all required permits for use of borrow pits and disposal areas from local authorities, get approval from regional departments of SAEPF under the Government of KR, prepare a "Borrow Pits Development and Restoration Plan" and submit all necessary documents to MOTR of KR to obtain a license to extract aggregate materials from the State Agency for Geology and Mineral Resources. These requirements do not apply to existing borrow areas or aggregated facilities. When using private borrow pit, all permits (licenses, approvals from local authorities, regional departments of SAEPF under the Government of KR, etc.) are responsibility of the owner of borrow pit which should be indicated in the agreements signed between the contractor and the borrow pit owner. The contractor will need to prepare a site development plan which must provide the following information:

a. capacity and operation hours of a borrow pit;
b. development and extraction sequence of borrow pit;
c. technique and mechanisms for stripping and excavation operations;
d. operation and time schedule for borrow pit development;
e. extraction method and transport plan, including route(s);
f. safety rules and hours of operation;
g. expected quality of extracted materials;
h. topsoil storage/protection and environment protection steps; and,
i. rehabilitation of disturbed lands when site is decommissioned.
j. Calculation of mobile sources' emission charge.

190. To minimize dust, the contractor shall develop a dust suppression program and have it approved by the CSC. The Program will ensure unpaved haul routes leading to settlements be water-sprayed regularly to suppress dust. Trucks hauling earth/materials be covered when transporting materials, especially through settlements. Air quality measurements at receptor sites (primarily those specified in the baseline measurements) be done as prescribed in the Environmental Monitoring Plan.

191. **Disposal site for spoil soils and other construction wastes** – Excavation or cuts of soil materials along will require temporary or permanent areas for deposition. This should be done with proper arrangement with the landowner on which the excess soil will have to be deposited. Permanent spoil soil deposit areas should be coordinated with local officials and proper permit obtained accordingly. An Embankment Slope Management Plan detailing measures to be undertaken to minimize effects of wind and water erosion on stockpiles, measures to minimize loss of fertility of topsoil, timeframes, haul routes and disposal site. For construction waste, the Contractor shall establish a solid waste management plan 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 local and national regulations.

Safety for workers and local people, especially around the sensitive receptors - The

Contractor shall install necessary safety measures specified in the design or in the Technical Specifications to ensure that community and traffic safety issues shall be responded to during the construction phase of the Project, including incorporation of: (i) Safety barriers; (ii) Traffic signs; (iii) Road crossings; (iv) Speed bumps; and (v) Speed limits. Social impacts along the vicinity of the road during construction, such as impairment of the usual access, community health and safety concerns, plus socioeconomic conflicts. If any traffic re-routing needs to be done, sufficient advisory and notification should be provided to the people and motorists. Dust and noise nuisances should be minimized during construction. Protective barriers and fencing should be provided to prevent people and animals from loitering at the project site for safer purposes. During the construction phase, it may be inevitable that existing traffic will be disrupted and local accessibility will be impaired, which can cause problems with the local community. To mitigate this situation the Contractor should: (1) Submit a traffic management plan to local traffic authorities prior to mobilization; (2) Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions; (3) Allow for adequate traffic flow around construction areas; (4) Provide adequate signalization, appropriate lighting, well-designed traffic safety signs, barriers and flag persons for traffic control; and (5) Provide temporary access where accessibility is temporarily restricted due to civil works.

192. **Impacts on cultural and historical sites** – During construction the contractor must apply in writing to the local authorities in defining the protection zones around these sites. Also Contractor should employ equipment with less vibration causing, such as heavy compactor/ship foot roller without vibration for compaction and, for excavation, small power excavator or hand excavation shall be made, if necessary, during construction works (vibration) with minimal or no impact to any cultural, historical or archeological structures along the road alignment for safety side (present vibration level monitored was found to be much higher than the power level of heavy equipment at the location away some distance) Physical cordon around identified sites should be installed to minimize construction impact and alert workers/people from disturbing cultural and historical sites, especially near the following:

Cemeteries:

a. 158 – 160 km Cemetery on the (LHS), around 6 m from the road.
b. 153 km -155 km Cemetery (RHS) on a hill 20-50 m away from the road.
c. 152 +300 km Cemeteries on the both sides for Tugol-Say village. The distance between the boundaries of the two cemeteries, 25m; width of the existing road 13.4m. From the border of the cemetery (RHS) to the road 3 m; opposite side (LHS) 3-5 m.
d. 141 km +300 Cemetery on the left side (LHS) of the road, 10-15 m from the road.
e. 138 km Complex mausoleums - Clay mounds both sides. Located close to the road on the right (RHS) (3-3,5 m) and approximately 100 meters to the left (LHS).
f. 132 km Cemetery on the LHS located around road 20-30m from the road.
g. 131 km Cemeteries on the both sides (RHS 3m, LHS-3.5 km from the road)

193. The Contractor should strictly instruct its workers on disturbance of these sites. In accordance with the Law of the Kyrgyz Republic on historical cultural heritage, in the event of cultural monuments found, all construction works must be stopped and report the findings to the local executive authorities or any other competent organization (Institute of History and Cultural Heritage, National Academy of Sciences; Department of History, Kyrgyz National University after Balasagyn) and MoCIT KR.

194. **Asphalt, Concrete and Crushing Plant Pollution** - During the selection of a site for bitumen plant, concrete plant, stone crusher equipment, which emit pollutants, noise and transmits vibrations, the contractor will need to comply with SanPiN 2.2.1/2.1.1 and SanPiN

2.2.1/2.1.1.006-03, and establish a specific buffer zone around any such facility. In the KR this is referred to as a sanitary-hygienic zone, and is a mandatory element of any facility that affects habitats and human health. The sanitary-protection zone (SPZ) separates the area of an industrial site from residential areas, landscape and recreation areas, parks, and health resorts with mandatory demarcation of boundaries by using specialized information signs. The boundaries are as follows:

- Class II – SPZ 500m.
  - ✓ Production of asphalt-concrete at fixed plants.
  - ✓ Production of asphalt-concrete at mobile plants.

- Class III – SPZ 300m.
  - ✓ Production of crushed stone, gravel and sand, milling of quartz sand.

- Class III – SPZ 300m.
  - ✓ Borrow pits of gravel, sand, and clay.
  - ✓ Bitumen plants

- Class IV – SPZ 100m.
  - ✓ Concrete solution plants.

195. **Contractor Good Housekeeping**. Garbage and sewage and solid and liquid waste from equipment maintenance can be serious pollutants and disease vectors. The contractor will therefore need to practice good worksite and construction camp management. Inspections by the CSC environmental specialist will take place monthly and any compliance issues such as strewn garbage, open waste pits, oil soaked ground and unsanitary washing facilities for workers, the contractor will be subject to an immediate fine and a stop-work order will be issued if cleanup is not underway within 12 hours of detection. If the contractor does not act, the CSC will retain an outside firm to clean up the area and this amount will be deducted from the contract total.

196. **Occupational Health and Safety**. 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 KR 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 cleared when reaching capacity by the contractors to prevent outbreak of diseases.

197. 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. The contractor will arrange for extra payment if community services are to be used.

198. 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. 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.

199. **Ecological Environment-**Given that the project coverage area is within the right of way of the existing lines of the Technical Categories II, it is assumed that the environmental impact will be negligible, except for the impact of cutting down mature trees that have already been discussed in detail above existing waters (rivers Tugol Sai, creeks, streams, ponds, canals and chutes) along the project road should be given special attention, as they may be the habitat of species of animals. Work crews should be aware that the representatives of the fauna should not be killed or captured during the execution of works. In the best case, interference in the environment must be designed so as to provide sufficient space to escape to allow animals to move independently. If the animals are inadvertently trapped in the work area / areas, workers must find ways to help these animals to escape unharmed.

200. **Social Environment**

(a) Traffic and Congestion

The impact of the road rehabilitation project will include the violation of the course of traffic on road sections. Before starting the work, Contractor will study the material prepared by the Consultant and provide local traffic police traffic management plan, and publish information about the scale and timing of construction works, as well as the possible disruptions of movement and access restrictions. During construction work, the contractor will organize the appropriate level of traffic to bypass the construction work areas, including the provision of staff who will monitor the traffic and, where necessary, road signs indicating the presence of a bypass road.

(b) Pedestrian and Animals crossings

Pedestrian and animal crossings - in addition to the planned movement of animals and people after opening the reconstructed road will also be necessary to organize a transition place during construction. To address this issue, Contractor will need to develop an internal program to ensure the passage of people and animals to bypass the work areas and crossing the road during the construction period. This program should be available at any time at the request of the Inspector, acting on behalf of the Consultant.

2.3. Operations and Maintenance Phase

201. After the Handing-Over to the Client, a one-year defects liability period ensues, in which the Contractor will still be responsible in remedying any deficiency or flaws in the overall works. After which the Operation and Maintenance Phase follow, in which the Client takes over with full responsibility for the operations and maintenance of the road. Impacts on the environment shall be on the usage of the road by vehicular traffic and subsequent maintenance activities to retain the service level of the infrastructure.

202. The projected service life of the road is 20 years and over this operations period, the impacts related to traffic on the environment are rather viewed as cumulative on account of the functions of the road components and can be in conjunction with other activities. Time-wise these impacts can also be long-term as they may manifest after construction and continue to persist for the entire usage and operation of the road. The perceived impacts and corresponding mitigation measures during the operation of the road will be on:

a. Traffic safety to the communities – traffic safety signage, signals, speed regulators, grade separation crossings, etc. should be installed. Enforcement of safe traffic speed should be heightened to instill discipline on motorists.

b. Biodiversity – areas which can be habitats of flora and fauna should be protected by the national and local government from public intrusion. Instructional signs should be installed and enforcement of regulations should be strengthened.
c. Water quality – spills from vehicles should not reach the bodies of water to avoid water contamination. Petroleum and chemical discharges from vehicles should be prevented by designating stops at safe distance from any existing waterways.
d. Air quality – the good air quality can be maintained by vehicles running in good condition to minimize emission levels. The authorities should discourage usage of outmoded vehicles with high emissions. Trees should be planted to act as carbon sinks to vehicular emissions.
e. Noise – since the traffic noise levels is estimated higher than acceptable international level (58 dB) for residents and sensitive receptors, driving speed of vehicles shall be limited to 40km/h in the maximum only when they are passing through settlements. The noise can be further minimized by proper maintenance of vehicles. In addition, sensitive receptors can be shielded from noise by planting buffer trees along the alignment.

Air Quality and Noise

203. As per estimate in the traffic study, the growth rate is as follows: (i) 2011-2024 = 4.2%; (ii) 2025-2029 = 3.7%; (iii) 2030-2035 = 3.2%; and (iv) 2036-2040 = 2.8%. After adding the diverted traffic and applying the growth rates the future traffic are around 2, 434 cars. Comparing this value with Road Classifications for Kyrgyz Republic, it shows that Category II road will be sufficient to service the future traffic.

204. After computations the maximum traffic can be around 2, 434 vehicles per day, with this growth, will come the elimination of older more polluting vehicles from the fleet, fewer stops and starts due to better road conditions and traffic management, better engine technology and vastly more fuel efficient vehicles. Further, KR will receive better refined fuels with lower emission factors per liter used. The air quality in the project corridor was presented in Table 14 and estimate as normal. Future prediction also is presented in Figure 6. Conditions can be improved by enforcement of annual inspections, especially for the small and large buses and trucks, which contribute most of the emissions. Secondly the required use of catalytic converters and other pollution abatement devices needs to enacted into law and enforced. Having studied and considered various similar calculations to determine pollutant emissions by various traffic densities during the operation, we can conclude that the maximum ground-level concentrations of pollutants at a distance of 3 m to 5 m from the road shall not exceed the maximum permissible concentration.

205. A high grade road, properly signed, with good lane markings and careful intersection management, will allow the traffic to move more smoothly thus reducing the high emission due to frequent acceleration and deceleration. Road safety features such as, streetlights, traffic lights pedestrian crossings, livestock crossings and other visual means to reduce accidents will be installed along the road.

206. Noise - The noise survey completed in Nov 2015 (Table 15), together with result by JOC monitoring, showed that noise levels along the project corridor and for about 3 m on either side of the carriageway, exceed guideline values of the World Bank. Noise levels that interfere with sleep and impact schools and hospitals now exist along the road.

During operation period, after reconstruction of road, level of noise and vibration impact will increase since the road traffic intensity will increase, although road pavement will be better. However, having studied calculations of similar facilities may conclude that levels of noise impact

will be higher than international standard and sound wave shall spread to a distance of 50m from the road.

207. Vibration – The vibration survey performed has revealed that the present vibration level is so high (however within the allowable limit set) and additional vibration caused by the future traffic volume will be considered as less than present vibration level.

208. The only real mitigate measure is to install noise barriers, along the noisiest stretches, based on further noise testing during the operating period. Another option could be the reduction of vehicle driving speed by law and/or construction of earthen berms helping to deflect the noise for the area sensitive receptors is there. It may be possible to use the crushed asphalt as a base for building the berms, then landscaping them with topsoil and vegetation including local drought resistant plants such Loch broadleaf. Therefore, noise testing will take place at the same sites used during the 2015 survey. The schedule will be conducted 2 times for a six-month period during year 1 of the operating period. The resulting date will be used to determine the best noise mitigation measure.

Soils and erosion control

209. If the contractor properly implements the measures defined in the EMP for the construction period and CSC's environmental specialist completes a post-construction safeguards audit of to confirm all mitigative measures were implemented and remain operational, soils and erosion issues associated with the road should be negligible. Confirming that topsoil and planting were put in place as the work was being completed (not after the construction is completed) the tree planting was done and trees are healthy and being maintained will be essential. On the engineering site inspection of the culverts will be critical since their placement at too steep an invert slope will result in serious and chronic downstream (exit) scouring. To avoid this invert slope should be at the same grade as the natural waterbody and a concrete pads or preferably energy dissipation installation such as large rocks and rock gabions, installed.

210. Slopes of high embankment or cut shall be inspected in rainy season if there are gulley erosion, sign of landslide, collapse or slipping regardless of the scale. If such sign is noted, immediate repair wok shall be implemented not to make the situation worse.

211. Further, culverts need to be inspected to ensure that all debris and construction materials have been removed and any stream diversion structures have been completely removed. To that end the CSC and IPIG will prepare a culvert inventory that will provide a photo of each culvert and its condition during each inspection, which should be annually and submitted to MOTR of KR. Two photos will be required, one at the upstream and a second at downstream end of each culvert.

212. MOTR will assign this work will be assigned to the contractor during the one-year warranty period, after road becomes fully operational; and after that period, taken over by MOTR's maintenance unit.

Ecological Environment

213. The only ecological issue that could arise during the operating period is a failure to properly maintain the large tree plantations, and also the noise attenuation berms (if these are to

be built) landscaping. The local ecosystem will be significantly altered by the cutting of the trees and therefore the replanting and tree maintenance program, until the trees are at least 9-10 years old will be critical to reestablishing the pre-cutting conditions of roadside shade during the summer and windbreaks during the winter. The roadside forest, admittedly planted many decades ago, is the only mature tree assemblage within many km of the alignment. It is home to many thousands of creatures, mostly insects and birds and is an open forest-track ecosystem. It has a microclimate and huge benefits for people living under them or benefiting from their shade and shelter. Therefore, as stated many time in this IEE, cutting should be minimized to the greatest extent possible by using innovative designs that build the trees into the road structure.

Socioeconomic Environment

214. Livestock and Pedestrian Crossings– Since the road section traverses residential areas, farmlands and pasture grounds, the need to provide pedestrian and livestock crossing becomes important. Category II Road allows design speed of 120 km/hour in rolling terrain (60 km/hour in mountainous terrain) for vehicular traffic, such that crossing people (especially children) and livestock (sheep, cattle, horses, etc.) pose real danger. Also on the road need to install the road signs indicating the places of transition of people and livestock. The crossing of people in the residential areas will be installed through every 200-250 m.

2.4. Climate Change Impacts on the Project Road

215. Climate Change Study of the Project Road was included as a separate sector. This study focused on the following impacts to the project road:

a. River floods and water logging in spring, due to more intense rainfall. This will mainly affect lower altitudes and areas susceptible to flooding;
b. Heat stress in the summer, especially at lower altitudes;
c. Mudslides related to more intense rainfall in the spring at medium altitudes (and in a lesser degree also high altitudes);
d. Flush floods in the summer especially at higher altitudes, related to higher temperatures together with the increase in winter, spring and autumn rainfall (snow at higher altitudes).

216. The study made reference to the climate simulations done by the International Fund for Agricultural Development (IFAD) for Kyrgyzstan in which it indicated that the “Section «Epkin (Km 89) to Bashkugandy (km 159)” located at an area with low or very low vulnerability risk as compared with the north of Chuy Oblast and other high altitude areas. Moreover, as per IFAD the vulnerabilities identified are mainly related to increased heat stress at the project areas with low altitudes and mudslides at medium altitudes. Very limited information on the occurrence of extreme rainfall was found, but with relation to emergency situations, there is a tendency of reduction of rainstorms.

217. The hazards related to flooding have been studied using UNEP’s Global Risk Data Platform which entails hazards modeling was developed by the World Meteorological Organization (WMO) and the United Nations Education and Scientific Cultural Organization (UNESCO). As per data in the Platform, the flood hazard will increase along major rivers in the Central Asia region, but Kyrgyzstan and the project area is less influenced by this than the neighboring countries. The project area is located in areas of low risk, whereas the risk increases at higher altitudes.

218. The values of seasonal temperature changes by year 2100 anticipate a greater increase of summer temperature in comparison to other seasons, and the minimum increase is predicted for the winter period. On the positive side, warmer winters due to climate change can alleviate the clearing snow; which would mean less maintenance cost during the winter months.

F. Analysis of Alternatives

219. Two alternatives were considered in this section:

a. Zero option – the «Inaction»/ do nothing alternative
b. The road reconstruction project

i. Zero Option

220. Within the framework of ADB's SPS 2009, an important consideration the alternative "Zero option" is being devoted on. The alternative "Zero option" presents case scenario in which the project is not to be done at all. By comparative evaluation, it can be inferred whether the project is necessary at all or provide some insights on how to properly proceed should the project be fully implemented.

221. **Atmospheric air.** The existing road surface does not meet the requirements of III road category. In some places, there is no "cold asphalt" road pavement. Due to unevenness of the road, vehicle engines run unevenly by releasing larger amount of exhaust gases than paved road. Dust formation is most likely to happen on places where there is gravel surface, which also affects atmosphere.

222. **Noise and vibration.** Noise is a major factor of concern people day and night, since lack of road coverage spreads the sound waves at great distances from the road and creates a high noise and vibration impact to the population, while vibration is predicted as within the acceptable range always according to the result of monitoring. The most sensitive recipients are residents of nearby houses to the road, schools, kindergartens, hospitals, private facilities and cultural sites.

223. **Surface water.** In places, where the road crosses channels and bridges, we can observe destruction of given structures and erosion of banks. In case of accidental destruction of some culverts and erosion of banks, we may observe pollution of water body. Runoff from the road surface flows to channel and river by causing water bodies' pollution with oil products and oils. This impact will be expressed in possible soil contamination with oil products, oils and waste. This Section has a river Tugol-Say.

224. **Soil**. Impact on soil is expressed in soil disturbance due to destruction of roadbed and going of vehicles beyond the right of way on nearby areas. Erosion due to attack of water flows by artificial structures, ditches and channels. Soil and water might be contaminated by spill oils, gasoline of vehicles.

225. **High Embankment and High Cut Slope** –No earth work is done with low safety factor of collapse/landslide. Linearity of road also be kept as present poor condition.

226. **Rehabilitation of Culverts** – Continued to be as present poor condition. However, no debris is generated.

227. **Powerlines/Pylons** - No powerline/pylons are affected.

228. **Groundwater –** are exposed to risk of contamination by the spill-oil of broken cars by traffic accident which risk may be reduced after project.

229. **Flora and fauna.** Impact on flora and fauna will be negligible, as the road is existing and has already caused anthropogenic impact.

230. **LARP and social issues.** Economic relocation and resettlement is not applicable. Social aspect is expressed in affecting communication routes of local residents, increase in time spent on the road to places of work and leisure. Poor traffic conditions for agricultural machinery, animal-drawn transport, cyclists and cattle driving. High accident risk might be created on the road and intersections with other roads. Moving vehicle causes vibration of buildings and structures. Dust pollution and gas contamination.

231. **Safety**. The road is not equipped with traffic indicators, signs, markings, which create prerequisites for accidents among population and vehicles crash. Violation of speed limits results in collisions and runs over people, animals and vehicles. There is no established road crossing places for people and cattle

232. If zero option is implemented, the benefit will be less traffic density and few road accidents. The negative side is increased noise and vibration, lack of proper road pavement, negative social aspect, and impossibility to develop the region's economy.

2. Alternative- the road reconstruction project

233. This Alternative is considering the reconstruction existing road of the section Epkin (Km 89) to Bashkugandy (km 159). The Road section from Epkin (km 89) to Bashkuugandy (km 159) will be reconstructed and the total distance will be 70 km. Main specifications of the projected road are given in **Section C the Project description**. During the pre-construction stage, reconstruction of the road will not have any environmental and social impacts. This period, the work will be associated with the design and proper planning of works, as well as informing the public and other stakeholders about the proposed work. During the construction period, air quality will be affected by vehicles, operation of road equipment and machinery, excavation works in mountain areas', soil, sandy gravel, crushed stone and operation of asphalt mixing plant. The impact will be provided by pollutant emissions from the operation of machinery and mechanisms and formation of dust. The impact will be exerted on the water bodies (irrigation channels, Tugol-Sai River) from operation of the machinery, construction camps, and possible contamination of water by oil and oil products, soil, residues of construction and household waste products. The impact on soil and land resources expressed by extraction of soil, ground, temporary diversion of land, and contamination by oil products, construction and household waste, as well as disturbance of topsoil by its misuse and stockpiling. The impact on the historical and cultural heritage will be expressed in the physical impact (possible disturbance of construction workers) to the cemeteries and burial grounds located in the vicinity of the road. During the operation, the main impact will be on air, physical factors as noise will have an impact, especially in the settlements. More detailed analysis of the alternatives of the environmental and social impacts is given in **Section E. Environmental Impacts and Mitigation Measures.** Given that the reconstruction of the road will be carried out on the existing road and the environment has already formed anthropogenic ecosystem, it can be concluded that the impact of the projected road on the environment will be insignificant, but in social terms the impact will be positive.

G. Information Disclosure, Consultation, and Participation This Section G is updated after public consultation for IEE

234. Formal and informal public consultations were done for the project during the study period. During the site visits some informal discussions were done with the villagers and some village heads as field information were being gathered. The IPIG organized a formal public consultation was arranged with the district heads to invite people of affected villages to present and discuss with them environmental and social issues relevant to the rehabilitation of the road.

1. Public Consultations and Participation

235. For Epkin (Km 89) to Bashkugandy) (km 159), in accordance with ADB's Public Communications Policy (2011) and SPS (2009), Public Consultation meeting on the environmental aspects was undertaken on 18 March 2016 in Bashkugandy Village Office (see Photo below). This was organized by the IPIG-MOTR through official communication to the local leaders inviting stakeholders in the surrounding villages. As recorded there were 18 residents from the villages (see attendance sheet in Annex B) through which the road section will traverse.

236. During the public consultation the Consultant (Kocks Consult, GmbH), prepared PowerPoint presentation regarding the technical features of the project and explained the potential environmental and social impacts with corresponding mitigation measures. This event was organized by IPIG-MOTR representatives [4] with PPTA Consultants assistance. The representatives of the MOTR-IPIG answered questions and clarify any issues that were raised. In addition, the participants also were provided a sheet of paper on which the can write their questions and comments. Printed hand-outs of the presentation were prepared and distributed to the people for their information and as a way of disseminating the environmental concerns of the project to the general public. Below is a photo of the public consultation.

Figure 10: Public Consultation in Bashkugandy (18 March 2016)

237. The questions raised verbally during the forum were responded right away. As mentioned

[4] Mr. Asylbek Abdygulov, environmental specialist of IPIG-MOTR; Mr. Ruslan Satybaldiev, project coordinator of IPIG-MOTR

above, the people who attended were provided with a sheet of paper on which to write their questions and comments on the project. The recorded questions and corresponding responses by the IPIG-MOTR were captured in a video with the transcript shown in Annex C. The verbal and written comments and questions that were raised were compiled and presented as follows and in Table 18: Comments/Recommendations:

(i) Traffic Safety:
(ii) Possibility of bypassing the villages/schools
(iii) Need to provide roundabout crossings
(iv) Additional Infrastructure:
(v) Need for irrigation ditch crossing the roads
(vi) For Contractor transfer old removed structures/pipes to the village authority
(vii) Need for water supply pipes
(viii) Improvement of bridges
(ix) Underpass connection between markets
(x) Need for street lighting and sidewalks along the road
(xi) Economic impact:
(xii) Need to connect market to road
(xiii) Environmental Concern:
(xiv) Protection of cemetery structures
(xv) Relocation and Compensation:
(xvi) To check property boundaries

Table 18: Summary Table on Public Consultation for Epkin–Bashkugandy

Data	Place	Participants	Questions	Answers	Note
March 18, 2016	Bashkugandy village Administration .	IPIG /MOTR Asylbek Abdygulov safeguard specialist RuslanSatybaldiev Regional Project coordinator Kocks Consult Sam Sapuay International safeguard consultant Lola Shatirishvili, resettlement specialist	Sidewalks along the project road	In the project design it is considered inclusion sidewalks in the residential areas.	-
			Construction standards in swampy areas	In accordance with national legislation on road construction	-
			Timing of Construction	3 year and 1 technical guarantee	-
			Usage of recovered pipe culverts	Transferred to Local RMU-24 of MOTR	IEE

238. Generally, the comments were minor with the following recommendations – possibility of bypass route, provision of roundabout crossings, irrigation ditches, water supply pipes, improvement of bridges, underpass connection between markets, street lighting, protection of cemetery structures, and confirmation of property boundaries with road corridor. The questions on the other hand were on construction standards on swampy areas, provision of sidewalks, timing of construction, and usage of recovered pipe culverts.

239. Several of the comments were already incorporated in this IEE/EMP such as concerns on damage to infrastructure and reconstruction of utilities. On the impact to infrastructure, provisions in the EMP were included to undertake good planning to enable infrastructure service not to be disrupted.

Formal and informal public consultations were done for the project during the study period. During the site visits some informal discussions were done with the villagers and some village heads as field information were being gathered. The IPIG organized a formal public

consultation with the district heads to and invited people of affected villages for presentation and discussion with them environmental and social issues relevant to the rehabilitation of the road.

240. During the field works unofficial meetings were carried out by team of environmental specialists with the local population about the planned project and its possible impact on the environment. Public consultation on social issues were conducted earlier and the public were given information leaflets on Kyrgyz and Russian languages, also was presented presentation and carried out survey. During the public consultation on environmental issues was noted on a good awareness of the planned activity, but it was also noted that the local population is more interested in social issues, and only few questions were on environmental impact.

241. Reconstruction of the road is planned on the existing road alignment and related with its expansion. The existing road is anthropogenic ecosystem and has already impacted on the environment. As defined in the IEE the impacts have the same type of effects on the entire road. However, this section has the sensitive areas, such as historical and cultural sites (cemeteries and burial grounds).

242. The organization of public consultations conducted by IPIG, Ministry of Transport, together with environmental specialists of KOCKS. To the public consultation were invited stakeholders from 4 villages along the road. On the result of the meeting, it became clear that most of the attending people were representatives of various governments and municipal structures and they were directed by local authorities. Following the meeting, representatives of the IPIG, Ministry of Transport have talked with representatives of the local administration about the composition of the participants in the public consultations and after that explanations were received. Local authorities decided that this work is on preliminary stage (feasibility study). During the detailed design stage environmental and social impacts will be more specific and Design Consultant will invite residents and other stakeholders. In this stage, for getting information on environmental issues, representatives of the structures and the elders of villages have been sent, who subsequently may inform awareness among concerned residents.

243. In order to more effectively engage local population in the process of informing on social and environmental impacts of the project, additional public consultation will be required. It is necessary to hold a public consultation at the detailed design stage for a representative stakeholder interaction. Carried out one meeting does not reflect the full understanding and awareness of the local population. Public consultation should involve all interested parties, including residents of settlements, which may be affected, or in some way can be subjected to the effects of the proposed activity. The route of the road passes through the villages and the reconstruction of the road and increasing the intensity of the movement, which can affect both positively and negatively on the people living in this area. In this regard, and according to the legislation of the Kyrgyz Republic, public discussion should involve all stakeholders, to identify their opinion, to give advice and suggestions on the proposed activity.

244. In order to inform a larger number of population of the villages along the road on the environmental and social issues of the project, IPIG/MOTR KR sent information letters with the results of the conclusions of IEEs to Rayon authorities, heads of village municipalities, and village elders for greater public awareness on possible types of environmental and social impacts during implementation of the road reconstruction project. This information letter is attached in Annex G. Also for more effective engagement with stakeholders, it is necessary to conduct public consultations in every village along the 70 km road.

The organization of public consultation is necessary to register participants, by indicating name, position, address and telephone number. Provide information for feedback to direct suggestions and comments.

245. Main representatives: Deputy of Village Council, Land specialist, Retiree, Head of Kuiruchuk v/a, Member of court of aldermen, Jumgal v/a, Court of Jumgal village, Architect of Jumgal region, Bash-Kuugandy v/a, Tugol-Sai v/a, Executive Secretary of Tugol-Sai v/a, Regional administration, Tugol-Sai residents. List of participants in Annex B.

2. Information Disclosure

246. ADB endorses the IEE it is made available as information to the public, both in English and in Russian languages.

247. The procedure for public hearings in Kyrgyz Republic includes the following steps:

a. Public notification on public discussions;
b. Providing public access to the EIA documentation from the project initiator and / or in other accessible locations (local authorities, the territorial bodies of environmental protection), as well as disclosure of the EIA report on the website of the proponent (if website exists);
c. The general public familiarizes with the EIA documentation;
d. In case of public interest:

    a. Public notice on the date and place of the meeting to discuss the EIA documentation;
    b. Collection and analysis of comments and suggestions, summarizing the results of public discussion of the EIA documentation.

248. The Russian version of the IEE will be available in the IPIG-MOTR office and copies shall be made available to the people through the Ayil Okmotu offices along the project road. The IEE shall also be disclosed to a wider audience via the ADB website. During the project implementation, periodic environmental monitoring reports shall be submitted by Implementing/Executing Agencies and correspondingly also be uploaded in the ADB website.

249. Should additional information be required at any time about the project, the public may visit the IPIG-MOTR or interact with the future construction supervision consultant who will be selected for the project. On-site consultations will be held for clarifications and provision of necessary information to the public and the stakeholders on as need basis.

H. Grievance Redress Mechanism

1. Objectives

249. The Grievance Redress Mechanism (GRM) is a process through which the affected people need a trusted way to voice and resolve concerns about the project and the project also finds an effective way to address affected people's concerns. In this project, the grievance mechanism will be in place by which the affected people will be fully informed of their rights and 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 long redress process.

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

2. Grievance Redress Group (RG)

251. 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.

251.1. Functioning of the GRG within the Grievance Redress Mechanism

252. The Grievance redress mechanism (GRM) involves the following 2 stages

appeals: Stage 1, Local (Village) Level
The grievances will first be 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 MOTR'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/MOTR consent.

253. 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.

254. 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 MOTR office in Bishkek with field trips of GRG members to the village of the complainant.

2.2. Composition of GRG

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

Local Level GRG

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

GRG Member	Position held
Head of Ayil-Okmotu	Chairman
Representative of RMU	Member
Female and Male Aps	Members (2)
Local Point of Contact	Member
Ombudsman of the Oblast	Observer
Consultant	Invited Expert

Central Level GRG

The central level GRG will be represented by 5-7 members of the following composition.

GRG Member	Position held
Head of IPIG of MOTR	Chairman
Project Coordinator at IPIG	Member
IPIG safeguards unit representative	Member
Representative of the RMU	Member
Local Point of Contact	Liaison between Local & Central GRG
Ombudsman of the Oblast	Observer
Representatives of APs (Male & Female)	Additional Observers

257. 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:

(i) Representatives of State Rayon Administration
(ii) Representatives of the Rayon Branch of the State Agency for Architecture and Construction
(iii) State Registration Services of the Rayon
(iv) Ministry of Agricultural
(v) State Agency for Environment and Forestry
(vi) Ministry of State Property
(vii) Ministry of Emergency
(viii) Technical expertise from professional engineers, and Consultants with relevant experience in environmental safeguards.

2.3 Duties of GRG Members

Local Point of Contact

258. Once AP files a complaint, the LPC is to undertake and complete the following tasks:

(i) screen the complaint for eligibility and, if found eligible register it the Complaints Log;
(ii) draft a complaint memo to be signed by the complainant, indicating the name of complainant, date and place the case of complaint occurred, apply the date and place of complaint submission, and attach supporting documents, as necessary;
(iii) send the complaint memo to all members of GRG, agree the date of GRG meeting;
(iv) request the rural administration authorities to organize the meeting;
(v) facilitate the GRG meeting by providing a storyline for the complaint and provide factual details and relevant documents obtained;

(vi) communicate request and queries of the complaints to the members of GRG (on central level to GRG/IPIG/ADB);
(vii) maintain the records of the meetings and communications between GRG and complainants
(viii) ensure administrative and organizational support to GRG members;
(ix) raise awareness of project stakeholders, including CBOs, NGOs AHs and local authorities on the GRM, it functions and objectives. Liaise between local and central GRGs to convey the information of the case of complaint that was not resolved on local level and became the case to be reviewed on a Central Level.

Chairman of GRG / Head of Ayil-Okmotu

259. Once the GRG Chairman is informed about the meeting date and schedule he/she is responsible to:

(i) review the complaint(s) and supporting materials if any ahead of the GRG meeting;
(ii) manage to obtain any additional information prior to GRG meeting date;
(iii) involve relevant task expert if such need is obvious after review of the complaint(s);
(iv) ensure members attendance and chair GRG meeting;
(v) ensure simple complaints (like notification of when construction starts or a copy of the entitlement brochure etc.) are handled /resolved at the local level during the meeting;
(vi) ensure that records (of each meeting, communication between GRG and complainant(s)) is accurately recorder by assigned member (Meeting Secretary) and saved in the GRG files;
(vii) convey requests and enquiries of the complainants to GRG members on Central Level if not resolved on Local Level.

RMU Representative

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

(i) Review all relevant recording of complaints and submitted documents of proof;
(ii) Participate to all grievance meetings, provide opinions and analysis, take minutes of the discussions (Secretary of the Meeting);
(iii) Accompany eventual assessment/valuation specialists in the field;
(iv) Ensure that claims from damages due to construction works are reviewed by the RMU and technical experts and assess the damages /losses incurred;
(v) 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 members of the GRG and if needed to IPIG as well. The summary report should determine, whether the case is:

a. solved without further action; or
b. solvable but requires compensation or other action; or

not resolved and requires pending actions, such as forwarding the complaint for review on the Higher-Central Level, to the Court, or to investigation to prosecutor's office.

(vi) If the complaint is considered valid and the needed compensation/action is to be approved by IPIG the case is forwarded to GRG on Central Level with the request to proceed the review and ensure execution of the redress action; and
(vii) When the complaint remains unresolved by Local Level GRG, and a complainant offered to lodge claim on the Central Level agree to act so, RMU representative coordinates with LPC and GRG Chairman to assists the complainant in lodging the complaint at a higher appeal level;
(viii) In parallel inform IPIG/MOTR and proceed with the organization of the central level appeal meeting.

Representatives of the APs

261. Two representatives of the APs, male and female persons from the affected community will participate in all GRG meetings to:

(i) act as the full right member of GRG;
(ii) provide relevant information related to the submitted complaints; and
(iii) provide other GRG members as relevant with a position note to be reflected in the final meeting report.

Invited Consultant /Field expert

262. Once notified of Meeting time and location the Consultant will:

(i) Review all relevant recording of complaints and submitted documents of proof;
(ii) If feasible visit the place of complaint to visually observe the spot and be fully aware of important details to share with GRG members during the meeting;
(iii) assist the GRG members to get into the insight of the complaint and assist them in finding feasible, reasonable, mutually agreeable and doable solutions.

IPIG Project Coordinator

263. Once notified that a complainant has lodged an appeal case at the Central level IPIG project coordinator will:

(i) contact the complainant(s) and draft a note with his/her understanding of the complaint;
(ii) participate to the appeal meeting, provide opinions and analysis, take minutes of the discussions;
(iii) if needed summon again assessment/valuation specialists and accompany them in the field;
(iv) request the chairperson to organize meetings, as necessary;
(v) maintain communication between GRG and the complainants; and
(vi) Complaint Register is kept with IPIG and a copy shared with the Consultant.

Representatives of IPIG Safeguards Unit

264. Once notified that a complainant has lodged at central:

(i) participate to all grievance meetings, provide opinions and analysis;

(ii) accompany eventual assessment/valuation specialists in the field, and
(iii) provide other GRG members as relevant with a position note to be reflected in the final meeting report.

Ombudsman

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

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

GRG Chairperson/Head of IPIG of MOTR

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

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

IPIG Project Coordinator

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

(i) contact the complainant(s) and draft a note with his/her understanding of the complaint;
(ii) participate to the appeal meeting, provide opinions and analysis, take minutes of the discussions;
(iii) if needed summon again assessment/valuation specialists and accompany them in the field;
(iv) request the chairperson to organize meetings, as necessary;
(v) maintain communication between GRG and the complainants; and
(vi) Complaint Register is kept with IPIG and a copy shared with the Consultant.

Representatives of IPIG Safeguards Unit

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

(i) prepare the chronology of events to understand sequence of developments prompting the complaint;
(ii) provide environmental and resettlement opinion on impacts claimed by the c laimant;
(iii) examine large claims over USD$10,000 with financial expert at Ministry and involve a qualified evaluator;
(iv) request the chairperson to organize meetings, as necessary; and
(v) maintain communication between GRG and the complainants.

Technical Experts

269. 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:

(i) provision of relevant technical opinion for the case reviewed;
(ii) carry out the needed investigations relevant to their expertise; and
(iii) provide recommendation when the legal opinion from the relevant state agencies is necessary.

2.4 Grievance Resolution Process

270. 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.

Steps	Action level	Process	Timeline
Step 1	Resolution	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 3 days.	3 days
Step 2	GRG Resolution	After receiving written complaints of AP, the LFP will review and prepare a Case File for RG 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 14 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 MOTR with conclusion and supporting documents prepared at local level.	14 days
Step 3	Resolution of GRG Central	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.	15 days
Step 4	Court of law	The court of law will be the last resort before the AP. Project Affected Persons can appeal to court should s/he disagrees with the decision of the Control Authority.	N/A

3. Additional Mechanisms Available for Grievance Redress

271. Any physical and legal person, any appellant can communicate his/her concern to the Court at any stage of grievance redress. The GRC will not restrict or influence the AP from applying to court for legal remedies. If the complaint is found invalid, the GRG formulates a response and sends a written letter to the complainant, explaining the reasons of rejection. The complainant can appeal the decision of the local Court and bring the case to the ADB Accountability Mechanism. The project level GRG does not in any way impede APs access to the ADB Accountability Mechanism (AM[5]) or to the judicial or administrative remedies the Kyrgyz Republic. The Information Pamphlet and Grievance Redress Form will carry the contact information for the Office of the Special Office Facilitator to be readily available once any AP may wish to register a complaint with the ADB AM.

5 Link to access relevant web page: www.adb.org/site/accountability-mechanisn/contacts

Complaint Receiving Officer
Accountability Mechanism
Asian Development Bank
6 ADB Avenue, Mandaluyong City 1550
Metro Manila, Philippines
Tel: +632 632 4444 ext 70309
Fax: +632 636 2086 Email contact form

I. Environmental Management Plan

1. EMP

272. The EMP in IEE of Feasibility Design Stage also was upgraded in this IEE. 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.

The EMP consists of two tables. Table 19 summarizes the environmental mitigation measures, and Table 20 provides an overview of the environmental monitoring.

Table 19: EMP Mitigation Measures

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	**Potential Impact**	**Mitigation measures**	**Institutional Responsibility**	
			Implement	**Monitor**
DETAILED DESIGN PHASE				
Air pollution and noise during construction	Excess NO2 pollution noise can be generated along road during construction as show in Figures 5and 8 respectively	To specify the installation of noise barrier, at least, at the boundary between construction area and sensitive receptor. Noise barrier is effective to air pollution as well. Actual locations, height, material (hard plate or vinyl sheet) of barrier shall be determined by consultation with receptors in construction phase before starting construction.	Design Consultant	IPIG of MOTR
Approximately 100 trees need to be felled on the Epkin - Bashkugandy	Tree losses that cannot be prevented. Main species are Populus alba, Elm	Any tree losses are compensated by new plantations. 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). Locations for tree plantings are within the existing Right of Way (ROW) at the locations where tree losses occur. 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: Populus alba (30%), Elm (70%), and deciduous shrubs Lohan in the villages	Design Consultant	IPIG of MOTR
Rehabilitation and/or replacement of existing 101 culverts	Generation of debris of old culverts (metal/ concrete waste)	Proper treatment of concrete/metal waste to reuse or recycle	Design Consultant	IPIG of MOTR
Falling down of pylons, located on the hill, when the foot of hill be cut.	Blackout by accidental fall down of pylons	Do not cut excessively the foot of hill, on which pylons are located. Retaining wall may be installed to reduce the volume of cut.	Design Consultant	IPIG of MOTR
Widening of 1 bridge – Tugol-Say	Potential water erosion processes at bridge and river embankments.	A bridge is to be widen. Design of erosion protection measures at lower parts of bridge embankments. Prefabricated concrete protection plates of gabion wall 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	Construction supervision Consultant (CSC) IPIG of MOTR

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	**Potential Impact**	**Mitigation measures**	**Institutional Responsibility**	
			Implement	**Monitor**
Road traversing cattle crossings	Too narrow to meet traffic 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	CSC, IPIG of MOTR
Cultural and historical sites protection.	Potential Construction works impacts cultural and historical sites and chance of monuments finding.	Specify following in TOR as requirement for the contractor -The objects of historical and cultural heritage are the objects of study and protection of the Ministry of Culture, Tourism and Information of the Kyrgyz Republic (MoCIT KR). - To prevent exposure to these objects it is necessary to develop Site Specific Management plan for cultural and historical sites, according to the law protection zone of objects is not less than 50 m. Therefore, all questions related to the establishment of protection zones, procedures, management plans should be coordinated with MoCIT KR and local government. - On the basis of the findings of Archaeological Study (Appendix F), during the construction stage, Consultant should send the road design along with the Management plan for objects of cultural heritage for MoCIT KR approval. - Conduct visual observation of the objects in cemeteries and mausoleums to document their state before the construction works jointly with MoCIT KR and local authorities.	Design Consultant	CSC, IPIG of MOTR, MoCIT KR
CONSTRUCTION PHASE				
General	Submittal of applications/site specific management plans before commencement of work	To submit Site Specific Management Plan including: - Cultural & Historical Sites Management Plan. - Construction noise suppression plan - Dust Suppression Plan - Camp and Workshop Management Plan - Solid and Liquid Waste Management Plan - Borrow Pits Management Plan - Material Processing Plants/Equipment and Storage Facilities Management Plan - Spoil Soil Management Plant - Embankment Slope Management Plan - Material Source Management and Reinstatement Plan - Method Statement for Bridge Construction	Contractor	CSC, SETI, IPIG of MOTR
Grievance Redressing	Establish and activate GRC	To immediately meet the dispute/issues/complains arisen from construction	CSC	CSC, SETI, IPIG of MOTR
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 sawn with a fast growing vegetation, e. g. grass	Contractor	CSC, SETI, IPIG of MOTR
Road alignment in areas of tree plantations. Embankment filling of the tree stem area.	Tree losses due to embankment fill.	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. - 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. Species to be planted are walnuts, maple ash tree, elm tree, white poplars, white willow, white acacia. - Plantings shall be conducted after technical works have been completed. Planting time shall be restricted	Contractor	CSC, SETI, IPIG of MOTR

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	**Potential Impact**	**Mitigation measures**	**Institutional Responsibility**	
			Implement	**Monitor**
		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 at least in 1,5 m height.		
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	CSC, SETI, IPIG of MOTR
The road crosses Watercourse Tugol-Say (148+874)	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 campsite are allowed near river floodplains.	Contractor	CSC, SETI, IPIG of MOTR
Prevention of water pollution water objects: Tugol-Say	Pollution of surface water	During the construction of bridges, site dimensions shall be the minimum necessary. Construction site should be placed at levels that exclude them flooding. The discharge of polluted water, landfills, parking cars and the construction of temporary facilities within the water protection zones on the banks of rivers. On construction sites should provide capacity for the collection of sewage and garbage. In the water protection zones (not less than 50 m) of rivers it prohibits contamination of the surface of the earth, including the garbage dump, waste production, as well as parking, cleaning and repair of motor vehicles and road construction machinery, fueling. All works in water protection zone must be carried out based on permission from local authorities. It is prohibited extraction of local building materials in the water protection zones without permits of environmental authorities. The project documentation should include the restoration work after the construction of the bridge: the removal of the bed of the river islands, backfilled during the construction of towers; cleaning of the river bed and the flood plain from cluttering their objects, extracting and hauling piles of scaffolding and temporary supports; dismantling of temporary facilities on the construction site layout and land reclamation, including career and access roads.	Contractor	CSC, SETI, IPIG of MOTR
Operation of borrow areas and quarries	Potential disfigurement of landscape, vegetation losses and damage to access roads Increased dust emission Siltation and obstruction of surface waters	Some 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. New sites for quarries need to be developed in accordance with the requirements and procedures for obtaining permission Wet aggregates and/or provide cover on haul trucks to minimize dust emission and material spillage. Locate stockpiles away from surface waters. 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 MOTR 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.	Contractor	CSC, IPIG of MOTR

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 300 m downwind. Site selection for aggregate crusher has to be approved by the Safeguard Department in the IPIG of the MOTR.	Contractor	CSC, IPIG of MOTR
Operation of asphalt plant	Odor emission and safety risks	Asphalt plants shall be 500 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 MOTR.	Contractor	CSC, IPIG of MOTR
	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	CSC, IPIG of MOTR
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: 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. Sewage management plan for provision of sanitary latrines and proper sewage collection and disposal system to prevent pollution of watercourses; 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; 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. Prior to the commencement of works the site installations shall be inspected for approval. The selected site will not be on top of ground water area or near surface waters.	Contractor	CSC
	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	CSC
	Health and safety risks to workers and adjacent communities	For health and safety protection of workers and adjacent communities the following shall be provided: adequate health care facilities (including first aid facilities) within construction sites; - 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; - Personal protection equipment for workers, such as safety boots, helmets, gloves, protective clothing, goggles, and ear protection in accordance with legal legislation; - Clean drinking water to all workers; adequate protection to the general public, including safety barriers and marking of hazardous areas;	Contractor	CSC, IPIG of MOTR

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	**Potential Impact**	**Mitigation measures**	**Institutional Responsibility**	
			Implement	**Monitor**
		safe access across the construction site to people whose settlements and access are temporarily severed by road construction; - Adequate drainage throughout the camps so that stagnant water bodies and puddles do not form; 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; -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.		
Work site operation / Operation of equipment maintenance and fuel storage areas	Soil / water pollution and restoration	Leaking of fuel over ground surface can cause disastrous results to groundwater (see Figure 8). 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. Store and dispose waste/used oil consistent with environmental legal requirements. 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 topsoil).	Contractor	CSC
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	. HIV/STD	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	CSC, IPIG of MOTR, local health units of the Ministry of Health
Earth works and various construction activities	Loss of topsoil Siltation of surface waters and/or impact on soils due to improper disposal of excess materials	Topsoil on the sections to be used as a stockpile for surplus construction material shall be removed and stockpiled to reuse them to cover these areas upon completion of works. In addition, an embankment slope protection 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 in the Site-Specific Embankment Protection Plan Mostly all excavated material will be reused. In addition, the reclaimed asphalt pavement will be recycled for the 1. The transfer of old asphalt to Local RMU of MOTR for up-filling of the secondary roads; 2. Use the old asphalt to strengthen the top coating of the road shoulders by adding the gravel-sand mixture with 15cm thickness. Thus potential impacts due to the need for disposal of excess material will be kept to a minimum.	Contractor Contractor	CSC CSC

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	**Potential Impact**	**Mitigation measures**	**Institutional Responsibility**	
			Implement	**Monitor**
	Air pollution due to exhaust emission from the operation of construction machinery i	Air pollution caused during construction can be mostly mitigated by the installation of noise barrier (as is effective also to air pollution) at the locations of sensitive receptors with the minimum height of 3m during construction tentatively (see Figure 5). However as common practice, 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	CSC
	Dust rising by earth work and lorry running over before-paved road in sensitive area	Spray water over the surface of unpaved road every 2 hours when it is dry and wind is strong, based on the Site Specific Dust Suppression Plan to be submitted before construction.	Contractor	CSC
	Collapse of high embankment/high cut slope	Proper construction as per TOR drawing/SSEMP with right slope angle, surface drain, steps, topsoil over slope surface, etc.	Contractor	CSC
	Generation of large amount of old culvert debris	Reuse/recycle of concrete/metal wastes	Contractor	CSC
	Falling down of pylon due to large excavation of its foot	When the pylon is located on the top of hill and the hill side is cut for enlargement of road, pylon can be exposed to the risk of fall down/collapse. To prevent, slope cu shall be minimized using retaining wall etc. Relocation of pylons is another alternative.	Contractor	CSC
	Disturbance of adjacent settlements and archaeological sites due to elevated noise and vibration levels	Although the construction noise is beyond allowable limit at certain area, it can be mitigated by means of noise barrier easily (see Figure 7). Following is common procedure to be taken: - Submit site specific Cultural & Historical Sites Management Plan for the approval of engineer and authorities in relevant before start construction. - Restrict speed limit to 30 km/h within 500m of any settlements. Restrict work along the road close to any settlement between 7.00 as to 6.00 pm. - Restrict work of large and noisy machinery in the vicinity of settlements to daytime and to agree the work schedule between the contractor and local communities. Vibration caused during construction is estimated as negligible in this IEE Report. As common practice, -Compaction shall be made by certified machinery only which complies with all KR laws concerning noise and vibration at construction sites SN 2.2.4/2.1.8.562-96 "Noise at work sites, living premises, public buildings and within residence construction site"; SN 2.2.4/2.1.8.566-96 "Production vibration. Vibration in premises, residence and public buildings".	Contractor	CSC, Traffic police service of the Ministry of home affairs
	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	CSC
	Traffic impairment	Submit a traffic management plan to local traffic authorities prior to mobilization. Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions Allow for adequate traffic flow around construction areas. Provide adequate signalization, appropriate lighting, well - designed traffic safety signs, barriers and flag persons for traffic control.	Contractor	CSC
Earth works and various construction activities (continuation)	Blasting	Blasting gives a quite big impact and procedure mentioned in the Site-Specific Blasting Management Plan which shall be submitted and approved before construction start	Contractor	IPIG of MOTR , relavent authority

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	**Potential Impact**	**Mitigation measures**	**Institutional Responsibility**	
			Implement	**Monitor**
Within settlements, encroachment into private and residential land, business, people, activities and socio-cultural resources including poor people's asset	Dislocation or involuntary resettlement of 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 implemented: 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 Increasing workforce and use appropriate equipment to complete the work in minimum time in the important areas Avoid construction work day time in sensitive times like festivals near religious places, if necessary.	IPIG of MOTR, CSC I	IPIG of MOTR
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.	One underground water pipe crosses the road was identified. Powerlines are running along and, ometimes, crossing the road (Annex A3). Measures will be ensured in engineering designing to avoid any disturbance to the existing infrastructure. 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. Submit site specific Solid and Liquid Waste Management Plan for the approval by the engineer and authorities related	Contractor	CSC, IPIG of MOTR
Construction activities works within villages and along sensitive receptors such as schools, hospitals, cultural sites.	Noise exceeding applicable noise standards. Vibrations may result in damage to local infrastructure, including private property and local (haulage) roads	For sensitive receptors such as schools and hospitals applicable noise standards shall be complied with as far as technically feasible by means (ex. erection of noise barrier) of noise reduction in case of exceedance of standards. In addition, required is a common practice, workable time of equipment shall be limited between 6 am and 6 pm in the maximum. For residents and sensitive receptors who are supposed to suffer from noise level greater than accepted level during construction, tentative installation of a plastic sheet wall supported by scaffold pipes along the road during compaction activity is recommended. Noise cannot cause any damage to physical infrastructure but to human only. Vibration caused during construction is estimated within allowable range depending on the monitored results. No special measures are required so far other than common practices specified in law. Grievance redress procedures shall be put in place to facilitate communication between the contractor and potentially affected people. 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.	Contractor	CSC, IPIG of MOTR
Construction works along sensitive receptors such as cultural sites.	Vibrations may result in damage to cultural structures.	Present vibration level monitored was as high as 90-95 dB while construction vibration predicted in the maximum is less than 90 dB. Therefore, no special measure is required, other than to follow the conventional, common practice as specified in TOR as: - Submit site specific Cultural & Historical Sites Management Plan for the approval of engineer and authorities in relevant before start construction. No further vibration higher than present level is expected. However as common practice, - Applicable vibration standards shall be complied with as far as technically feasible by means of vibration measurements and in case of exceedance of standards, contractor should strictly utilize equipment with less	Contractor	CSC, IPIG of MOTR

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	**Potential Impact**	**Mitigation measures**	**Institutional Responsibility**	
			Implement	**Monitor**
		vibration impact. (construction vibration is estimated as negligible) - Grievance redress procedures shall be put in place to facilitate communication between the contractor and potentially affected people. 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. - Physical cordon around identified sites should be installed to minimize construction impact and alert workers/people from disturbing archaeological sites, especially near the following: • 158 – 160 km Cemetery on the LHS, around 6 m. • 153 km -155 km Cemetery (RHS) on a hill 20-50 m away from the road. • 152 +300 km Cemeteries on the both sides for Tugol-Say village. The distance between the boundaries of the two cemeteries, 25m; width of the existing road 13.4m. From the border of the cemetery (RHS) to the road 3 m; opposite side (LHS) 3-5 m. • 141 km +300 Cemetery on the left side (LHS) of the road, 10-15 m from the road. • 138 km Complex mausoleums, Clay mounds. Located close to the road on the right (RHS) 3-3,5m, and approximately 100 meters to the left (LHS). • 132 km Cemetery on the LHS located around road 20-30m from the road. • 131 km Cemeteries on the both sides (RHS -3m, LHS – 3,5 m).		
Provide transport convenience for the CSC environment specialist	Monitoring of compliance by the contractor with the EMP requirements during construction works	In order to implement monitoring of compliance with the EMP requirements, the CSC environment specialist shall be provided with transport when required and a work place in the office at the construction site	Contractor	CSC, IPIG of MOTR
In case cultural and historical monuments have been found	Potential Construction works impacts on cultural and historical sites and chance of monuments finding.	In accordance with the Law of the Kyrgyz Republic on historical cultural heritage in the event of cultural monuments found, Contractor must stop all construction works and report the findings to the local municipal authorities or any other competent organization Institute of History and Cultural Heritage, National Academy of Sciences; Department of History, Kyrgyz National University after Balasagyn), MoCIT KR. Also Contractor should employ techniques during construction works (vibration) with minimal or no impact to any cultural, historical or archeological structures along the road. Physical cordon around identified sites should be installed to minimize construction impact and alert workers/people from disturbing archaeological sites	CSC, IPIG of MOTR, MoCIT KR	Contractor
OPERATION PHASE				
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	In this stage of this IEE, air pollutions (NO2, SPM, SO2) caused by (increase number of vehicles are estimated as within allowable ranges of environmental standards up to the year 2030 (see Figure 6). However, in case air pollutions are found to be serious by monitoring results after operation, driving speed shall be limited and enforcement of muffler to all vehicles and, among all, passing of heavy vehicles shall be limited. To prevent accidents, cooperation from traffic police is inevitable to control vehicle speed properly. Since the traffic noise level predicted after operation is estimated as beyond the accepted level of 58 dB, all the vehicle shall limit their driving velocity only when they are passing the settlements. However, this speed limit	RMU-24 of MOTR , Road police service	Laboratory

MITIGATION MEASURES DURING DESIGN, CONSTRUCTION AND OPERATION				
Activity	**Potential Impact**	**Mitigation measures**	**Institutional Responsibility**	
			Implement	**Monitor**
		can be abandoned based on the actual monitoring implemented afterward.		
Ground/groundwater contamination	Increased risk of accidents with possible spills of harmful substances	Percolation of gasolines into sub ground can be critical, causing groundwater pollution in large area (see Figure 8). 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.	RMU-24 of MOTR	IPIG of MOTR
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.	RMU-24 of MOTR	IPIG of MOTR

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

a. Dust management which shall include schedule for spraying on hauling and access roads to construction site and details of the equipment to be used. The contractor shall pay a special attention to water spraying in settlements and at repair and construction sites.
b. Layout of the work camp and details of the proposed measures to address adverse environmental impacts resulting from its installation
c. Sewage management including provision of sanitary latrines and proper sewage collection and disposal system to prevent pollution of watercourses
d. 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
e. 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
f. Embankment 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.
g. Emergency response plan (in case of spills, accidents, fires and the like) prior to operation of the asphalt plant
h. 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
i. Cultural and historical Management plan

274. The SSEMP shall be submitted by the contractor for approval to the Construction

Supervision Consultant.

2. Monitoring

2.1. Monitoring plan

275. 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. All the monitoring during construction phase shall be implemented by CSC while it shall be made by the institution mentioned in the table.

Table 20: The 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
Water quality	pH, dissolved oxygen, oil products, turbidity, total suspended solids, conductivity, temperature, lead	Upstream and downstream where the Project road crosses the watercourse Tugol-Say (148+874)	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 monthly basis during construction stage	CSC
	Appearance of river water and contractor's activities as per SSEMP	Bridges and Culverts 1 bridge and 134 culverts	Visual inspection	Unannounced inspections during bridge and culvert works	CSC, SAEPF
Noise/ vibration/ air quality	Noise, vibration and air pollution including NO2, SO2, PM	At sensitive receptors within settlements Jumgal village, near the school on the road, LHS; • Kuyruchuk village, near the Azamat shop, RHS; • Tugol-Sai village, near the shop Kutman, LHS; • Bashkugandy village, near the school adjacent to the road, RHS. • Cultural sites (cemeteries)	By means of portable noise / vibration measurement device Sampling for air and laboratory testing afterward	Second round of baseline monitoring measurements to be conducted before construction start. Then a monthly basis during construction stage.	CSC, Laboratory as per the agreement
Dust rising	Appearance or dust concentration	Unpaved portion of road and borrow pi	Visual inspection or portable dust meter	In dry and windy day	CSC, Laboratory as per the agreement
Physical damage of the Cultural sites (cemeteries)	Appearance of cu sites (cemeteries)	Cultural sites (cemeteries): • 158 – 160 km Cemetery on the LHS, around 6 m from the road. • 153 km -155 km Cemetery (RHS) on a hill 20-50 m away from the road. • 152 + 300 km Cemeteries on the both sides for Tugol-Say village. The distance between the boundaries of the two cemeteries, 25m; width of the existing road 13.4m. From the border of the cemetery (RHS) to the road 3 m;	Visual observation	Second round of baseline monitoring measurements to be conducted before construction start. Visual observation in construction period where the cemeteries are	CSC

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
		opposite side (LHS) 3-5 m. • 141 km +300 Cemetery on the left side (LHS) of the road, 10-15 m. • 138 km Complex of mausoleums - Clay mounds. Located close to the road on the right (RHS) 3-3,5m and approximately 100 meters to the left (LHS). • 132 km Cemetery on the LHS located around road 20-30m from the road. • 131 km Cemeteries on both sides of the road (RHS -3 m, LHS - 3.5m from the road)		indicated (in the km). Document the condition of the cemeteries and mausoleums before constructions works.	
Tress	Number of trees located within the newly designed embankment and along proposed road	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 once a year	CSC control by IPIG of MOTR
Top soil preservation	Appearance of embankment surface	Where embankment is made	Observation by site visit. There should be no gulley erosion, wash away or land slide/collapse	Upon construction and once a month and more frequently in rainy season	CSC control by IPIG of MOTR
Equipment servicing and fueling	If spilling of oil/fuel at storages is visible If drum is put directly on the bared ground surface	Contractor's yard	Observations	Unannounced inspections during construction, once a month	CSC control by IPIG of MOTR
Worker's safety and health	Official approval letter for worker's camp; Visual check of availability of appropriate personal protective equipment; Evidences 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.	CSC
Worker's education on AIDS and STD	Evidence/record/ photo of education	To be determined by assigned Construction Supervision	Visual inspection of record/attendance of CSC to the education	After beginning of works and at appropriate intervals throughout construction	CSC, local health units of the Ministry of health
Asphalt plant	Possession of official approval or valid operation license	Asphalt plant	Inspection	Before work begins	CSC
Borrow areas	Possession of	Sand and gravel borrow pit and / or	Inspection	Before work	CSC control

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
	official approval or valid operation license	Quarry		begins	by IPIG of MOTR
Material transport 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	CSC
Stone		Job site / haul routes	Supervision spot checks	Unannounced inspections during work	CSC
Sand and gravel		Job site / haul routes	Supervision	Unannounced inspections during work	CSC
Exhausted gas from Asphalt plant and Machinery	If exhaust fumes, dust are visible or not	At site	Regular check of certificate/maintenance record of vehicles /equipment /plant Measurement of concentrations if necessary	Unannounced inspections during construction works	CSC
Operational stage					
Deterioration of noise /vibration environment and air quality	Noise level, vibration Level, PM, NO2, SO2	Along the new road especially near the sensitive receptors	Portable type detectors and sampling for laboratory testing	Once a year	MOTR and SAEPF
Road crossing livestock animals	Record of car accident with livestock 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 Admini-stration (UAD, LUAD, and GDAD BO)
Spills of harmful substances	If trace of spill is visual on the road surface/record of traffic accidents	Along the new road	Site visit/examination of the record from o the authority relevant	Once a year and whenever accident was caused	MOTR jointly with Road police service of the KR Ministry of home affairs and KR Ministry of emergency situations
Drainage damage	Leakages in drainage system and damages due to erosion	Culverts and drainage acilities	Site visit	Throughout the Year	Local MOTR departments
Tree maintenance along the road	Appearance	In locations of newly planted trees	Site visit	Throughout the Year	Local MOTR departments joint with local authorities

2.2. Budget on Mitigation Measures

276. Most of the mitigation measures require the contractors to adopt good site practice, which should be part of their normal construction contract, so there will be no additional costs to be

included in the EMP. Costs of design-related mitigation measures are included in the budgets for the civil works.

277. The primary impact that needs to be mitigated in the overall implementation of the project will be on the affected trees which were due to widening of the carriageway. These trees are mainly common trees such elm, poplar and black locust. The RAP has identified individual trees to be cut. However, in the vegetated areas, an estimate is presented based on accepted convention.

278. In order to have a higher degree of success for replacement of affected trees in the section, 2 saplings of the same or similar species is proposed to be planted. Accordingly, the estimated number of trees and cost for the affected trees to be to be substituted is shown below.

Table 21: Number and Cost for Mitigation of Affected Trees

#	Item	unit	QTY	Remarks
1	Affected trees due to widening	each	100	Indicated in field inspection for Cutting
2	For 1:2 Ratio of Replacement	Each	200	Estimated Trees to be Planted
3	Average cost of Replacement	Som	750	Cost of Sapling & Planting
	Total Cost	**Som**	**150,000**	**Budgetary Estimate**
	69 Som/ 1 USD	**USD**	**$2,173.9**	**Budgetary Estimate**

Table 22: Cost of the Noise Barrier

	Name of the structure	Quantity	Cost $	Total Cost $
1	Plastic plate: 5.4m × 3.6m	10	10	100
2	Construction pipes: 3m	12	50	600
				700

2.3. Budget on Monitoring Activities

279. The estimated cost for the environmental management and monitoring on the consultancy for the entire project construction period of three (3) years is shown in the Table 21 below. This will include fees and other associated cost for management and monitoring of the construction sites and affected areas in the project road. In addition, the main Contractor shall undertake periodic parametric measurements as basis for action to improve their performance on the implementation of measures. Hence, a budget for periodic parametric measurements is hereby included in the Table 22 below.

Table 23: Budgetary Cost for Environmental Monitoring Specialists

Item	Quantity	Unit Cost	Total Cost
Implementation of EMP		US $	US $
International Environmental Specialist (IES)	6 months / 3 years, 12 days fourth year	14,000	91,000
National Environmental Specialist (NES)	21months/3 years, 12 days fourth year	2,500	53,750
Others (travel, per diem, surveys/interviews, reporting, etc.)	LS	20,000	20,000
Total			**164, 750**

Note: This cost estimate is as of May 2016.

Table 24: Budgetary Cost for Environmental Monitoring Requirements

Item	Quantity	Unit Cost	Total Cost
Implementation of EMP		US $	US $
Periodic Parametric Measurements	78		10,400
6 months a year x 4* point (air) x 3 (years) 1** month	76	150***	11.400
6 months a year x 2* point (water) x 3 (years) 1** month	38	100***	3,800
6 months a year x 4* point (noise - vibration) x 3 (years) 1** month	76	150***	11,400
Total			**37,000**

* - the number of points and measurements may vary
** - 3 years a physical work and 1 year a technical survey (measurements 1 month a year)
** *- the cost of laboratory services may vary.

3. Mechanisms for implementation

3.1. Institutional Framework

280. The relevant institutional entities for the project include the KR's Ministry of Finance (MOF), Ministry of Transport and Communication (MOTR), Investment Projects Implementation Group (IPIG) under MOTR, the State Agency of Environment Protection and Forestry (SAEPF), the State Inspection on Ecological and Technical Safety under the Government of the Kyrgyz Republic (SIETS), the Department for Disease Prevention and State Sanitation and Epidemic Control of the Ministry of Health Protection of the Kyrgyz Republic.

281. MOTR is responsible for transport sector development and is the Executing Agency (EA) for the project. IPIG is working under MOTR and will carry out the responsibilities assigned to MOTR. MOF is the responsible government body for coordination with ADB and other donors for foreign assistance.

282. SAEPF is a leading state environmental agency responsible for the environmental policy of the country and coordination of environmental activities of other state bodies. Its functions include:

a. Development of environmental policy and its implementation;
b. Carrying out a state environmental expertise;
c. Issuance of environmental licenses;
d. Environmental monitoring;
e. Delivery of environment information services.

283. SIETS carries out its activity in accordance with the Law "On Procedure for inspection of business entities". SIETS exercises control over compliance in established order of:

a. environmental legislation, set rules, limits and standards of environmental management, standards for emissions and discharges of pollutants and waste disposal in the environment;
b. requirements of industrial safety in the construction, expansion, reconstruction, modernization, operation, conservation and liquidation of hazardous production facilities;
c. requirements of land legislation;
d. requirements for safe operation of equipment and facilities for storage and distribution of petrochemicals and gas, cranes;
e. requirements of safe use rules in the construction, assembling and commissioning

of electrical networks and electrical equipment.

284. The Department for Disease Prevention and State Sanitation and Epidemic Center (DDPSSEC) of the Ministry of Health supervises sanitary and epidemiological welfare of the population, safety of goods and products, environmental compartments and conditions, prevention of harmful impacts of environmental factors on human health. DDPSSEC establishes MPC of chemicals in the environment with regard to the human health safety.

285. 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:

a. 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.
b. 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.
c. The 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.
d. CSC will conduct environmental monitoring and assist IPIG in implementing EMP and supervising the implementation of mitigation measures by the contractors.

3.2. Reporting Requirements

286. MOTR 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 MOTR within 1 month after the reporting period and then disclosed at ADB and MOTR websites. Contractor submits to CSC monthly reports and reports on compliance with mitigation measures and other corrective actions. CSC submits to IPIG quarterly reports containing a section on safeguard performance.

J. Conclusions and Recommendations

1. Conclusions

287. This IEE/EMP as part of the contract documents shall be adhered to by the Contractor. Accordingly, the Contractor shall require all his Sub-Contractors should follow also the EMP and such stipulations be shown in Sub-contracting agreements to be verified by the Engineer (or the CS Consultants).

288. The proposed Environmental Management and Monitoring Plans in this IEE will ensure that the good quality for surface water, air and noise in the general area is maintained, primarily during the construction phase. The focus of the assessment is to avoid (especially during design phase), reduce (during construction) and mitigate or compensate (also during construction) the impacts to physical and/or social

environment. Adequate public consultations were done in introducing the project as well as presentation of environmental and community impacts and the stakeholder concerns were incorporated into the IEE. The IEE will be disclosed to the public and can be viewed on ADB websites.

As per the Kyrgyz Law, the proposed project will require permits from the government regulatory agencies: The Environmental Permit will be processed by the IPIG with the State Agency on Environment Protection and Forestry after the IEE is cleared with the ADB.

2. Findings and Recommendations

289. The environmental impacts of the Project Road have been assessed and described in the previous sections of this document. Potential negative impacts were identified in relation to design, location, construction and operation of the improved road. Mitigation measures have been developed for finalization in the detailed design phase, for implementation in the construction phase and subsequently for the operations phase to reduce all negative impacts to acceptable levels.

290. As per assessment in this IEE, the proposed Road Project is unlikely to cause significant environmental impacts because:

a. The proposed project activities are focused on the improvement and reconstruction of the road restricting the works along the Right-of-Way with the main intent to improve the quality of life and quality of environment of the impacted districts;
b. The potential negative impacts associated with the design, construction and operation of the proposed Project activities will be temporary, and localized in extent and can be mitigated to acceptable levels;
c. Sources of materials can be adequately investigated at the project sites and the projected excess cut materials will be sufficient to cover for the fill requirements. The materials can be stockpiled and stabilized in nearby areas without posing environmental issue, however subject to permission by legitimate owners;
d. There will be no Project activities that will involve permanent or temporary loss of income and/or livelihood but rather redound to possible improvement of household earnings due to possible employment of local people in the construction;
e. The institutional framework has been developed to specify the procedural requirements and responsibilities to ensure environmentally sustainable implementation, i.e. involving IPIG (Client), CSC and Contractor; and
f. All construction and operation activities will be monitored and reported by IPIG (by employing CSC) in accordance with the Environmental Monitoring Plan.

291. To ensure environmental and social safeguards, the IEE presents the following recommendations:

a. The EMP will be followed carefully and required reporting completed in a timely fashion.
b. For noise and air pollution management, installation plastic sheet tentatively as noise barrier is feasible and effective to protect sensitive receptors during construction. All necessary mitigation procedures shall be taken and monitoring shall be continued as stipulated in the regulations. During operation, driving speed of vehicles passing through settlements shall be limited to 40 km/h or less. These

implementation of these measures shall be confirmed based on the actual noise monitoring results.

c. Mixing of gasoline with groundwater/surface water shall be prevented by any means. it is hazardous as drinking
d. The tree management and maintenance function should be passed to local communities or RMD, until trees have reached 8+ years and do not need careful maintenance.
e. CSC and IPIG will deliver the training to all active project participants and concentrate giving sound advice to the contractor, especially on the preparation and implementation of the CEWP.
f. Shortly after the operating period starts, the CSC and contractor will conduct safeguards compliance check to be sure that all measures required of the contractor have been met.
g. This IEE is “living” document and if required, it will be updated taking into account all environmental requirements, and any significant changes will be discussed and agreed to with ADB.

292. It is important that the Contractor and his Subcontractor that successful implementation entails not only provision of the infrastructure but also preservation of the environment within the framework of Sustainable Development.

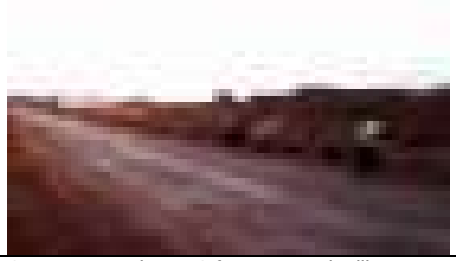
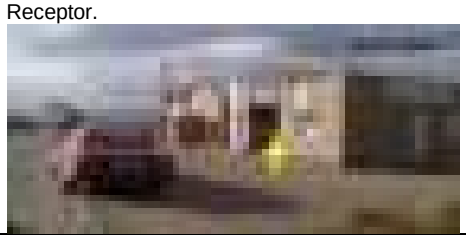
ANNEXES:

Annex A1: Alignment Sheet

The result of the site visits by the international and local environmental specialists are summarized in an Alignment Sheet. This shows relevant environmental features which can be of concern during the implementation of the road. For the section Epkin (Km 89) to Bashkugandy (km 159), the Alignment Sheet is shown below.

Alignment Sheet Information

№	Section	Description	Parameter	Comments
Section: «Epkin (Km 89) to Bashkugandy (km 159)"				
1	91 km	Five (5) trees may have to be cut down (LHS/RHS)		To be verified with the design
2	103 km	Small settlement	Noise	Within allowable range
3	94 km	Old borrow pit with sandy-gravel material (RHS)		Potential Material source to be verified
4	99 km	Two (2) trees may have to be cut down		To be verified with the design
5	101 km	There is an old borrow pit with sandy-gravel material (RHS).		Potential Material source to be verified
6		This borrow pit is roosted by wild pigeons seemingly for all year around. This area is a habitat of European hare, foxes, snakes, harvest mice, chukars, ravens, magpies. There are wolves and lynxes in the mountains. From 101 to 111 km there are swamplands and water outcrops on the sides of the road.		Special measures for habitat protection
7	103 km	Small settlement	Noise	Within allowable range
8	107 km	The road up to Kyzart Pass is unpaved. On the left there is a Jumgal cattle market which is working 1-2 days a week. Cars raise dust on the road.		Dust control measures to be more intensive here
9	108 km	There is a rock deposit with sandy-gravel ground which can be used as a borrow pit.		Potential Material source to be verified
10	111 km	There is an old borrow pit with sandy-gravel materials (RHS)		Potential Material source to be verified
11	114 – 116 km	The road narrows between the mountains; therefore, blasting works may have to be done. The area is generally rocky.		To be verified with the design
12	113 km, Kyzart Pass	Kyzart pass. There are small tributary rivers along the road.		Measures to protect water quality will be needed
13	122 km	There is an old borrow pit with sandy-gravel ground (LHS) in 125 m away from the road		Potential Material source to be verified
14	124 km	Eighteen (18) trees to cut down in the general area		To be verified with the design
15	128 km +700, Jumgal village	Jumgal village has a local health post, school, mosque and club. There are 11 grades in school and around 400 students. Drinking water is obtained from rivers and springs. Irrigational network is going through the village; the water source of which is Koldu-Suu River.		Possible extra measures for social impacts/ concerns
16	129 km +200 129 km + 400	Location of administrative building, a mosque (RHS) School, shop (LHS). Sensitive receptor. 	Dust, Noise, Vibration, SO2 NOx CO	Physical analysis and instrumental measurements Possible extra measures for social impacts/ concerns
17	131 km	On the both sides of the road there are cemeteries of Jumgal village. The first part of		To be verified with the design Special

№	Section	Description	Parameter	Comments
Section: «Epkin (Km 89) to Bashkugandy (km 159)"				
		the cemetery starts at the LHS -3.5 m, and ends on the RHS - 3.0 m. The width of the roadway is 12 m. The distance from the road to the boundary cemetery is 7.9 m. 		measures should be in place to protect structures
18	132 km	Cemetery on the LHS for Jany-Aryk village located around road 20-30m from the road. Jany-Aryk village itself is 2km away from the road, LHS. There is an old borrow pit with sandy-gravel ground (RHS).		Special measures should be SSEMP to protect structures Potential Material source to be verified
19	138 km	Possible existence of historical/ old cemetery Clay mounds were found. Located close to the road (3 -3,5 m) on the right (RHS) and approximately 100 meters to the left (LHS).		Special measures should be SSEMP to protect structures
20	138 km + 800	Around 50 m from the road (LHS) - reservoir and gate to regulate water to Jumgal River		Special measures to protect water quality
21	139 km, Kuyruchuk village	Village Kuyruchuk located at a great distance from the road and the track does not pass.		
22	140 km +700	One (1) tree may be cut down at RHS located 8.2 m from the center of the road		To be verified with the design
23	140 km +900	Around 15 trees may be cut down at LHS located 4.8 m from the center of the road		To be verified with the design
24	141 – 142 km	Around 20 trees may be cut down at RHS located 5.5 m from the center of the road		To be verified with the design
25	141 km +300	Cemetery on the left side (LHS) of the road, 10-15 m.		Special measures should be SSEMP to protect structures
26		Old quarry loamy soil (RHS) 150 meters from the road		Potential Material source to be verified
27	141 – 142 km	Around 50 trees to cut down in the area. Kuyruchuk village is far away from the road.		To be verified with the design
28	148 km	Adjacent to the road: Shop "Azamat", 2 cafes and a source "Kuyruchuk Bulagy". Sensitive Receptor. 	Dust, Noise, Vibration, SO2 NOx CO	Physical analysis and instrumental measurements
29	148+874, Bridge through river Tugol-Say.	Bridge through river Tugol-Say.	Warter guality measuremaents	Water quality protection measures will be needed

№	Section	Description	Parameter	Comments
Section: «Epkin (Km 89) to Bashkugandy (km 159)"				
				
30	149-150 km, Tugol-Say village	Tugol-Say village has a health post, school and a mosque. Sensitive receptor. 	Dust, Noise, Vibration, SO2 NOx CO	Physical analysis and instrumental measurements Possible extra measures for social impacts/concerns
32	151 km	Shop "Kutman» (LHS). Sensitive Receptor.		
32	151 km + 300	Mosque, 2 shops (RHS). Sensitive receptor.		
33	152 +300 km	Cemeteries on the both sides for Tugol-Say village. The distance between the boundaries of the two cemeteries, 25m; width of the existing road 13.4m. From the border of the cemetery (RHS) to the road 3 m; Opposite side (LHS) 3-5 m. Sensitive receptor.		Special construction techniques to utilize and measures should be SSEMP to protect structures
34	153 km -155 km	There is a cemetery (RHS) on a hill 20-50 m away from the road.		Special measures should be SSEMP to protect structures
35	157 km	One (1) tree may be cut down at RHS located 6.7 m from the center of the road; while 3 small trees on LHS; additional 9 more in the area may be affected.		To be verified with the design
36	158 – 160 km	Cemetery on the LHS, around 6 m from the road, 2 trees to cut down.		Special measures should be SSEMP to protect structures To be verified with the design for impacts

Annex A2: Earth Work Proposed

No.	Km from	Km to	Type of earth work	Side	Length, m	Maximum width, m	Maximum height, m
1	89.080	89.160	Cut	RHS	80	10	3
2	98.460	98.780	Cut	Both sides	320	4	1
3	107.100	107.400	Cut	RHS	300	18	5
4	110.540	110.680	Cut	RHS	140	10	3
5	110.680	110.950	Fill	Short cut	270	50	12
6	111.360	111.700	Cut	Both sides	340	40	10
7	112.450	112.750	Fill	Full width of road	300	30	3
8	112.720	112.960	Cut	RHS	240	25	8
9	113.060	113.140	Cut	RHS	80	15	11
10	113.300	113.460	Cut	RHS	160	20	5
11	113.580	113.820	Cut	RHS	240	20	8
12	114.160	114.220	Cut	RHS	60	30	10
13	114.600	115.360	Cut	RHS	760	30	12
14	115.520	116.960	Cut	RHS	1440	30	10
15	117.280	117.540	Cut	RHS	260	30	13
16	117.700	117.940	Cut	RHS	240	4	1
17	118.520	119.440	Cut	Both sides	920	50	15
18	119.860	119.960	Cut	RHS	100	10	5
19	120.660	121.300	Cut	LHS	640	15	5
20	122.400	123.400	Fill	LHS	1000	10	3
21	147.400	148.000	Cut	RHS	600	10	5
22	151.000	151.220	Cut	RHS	220	10	5
23	152.400	152.820	Cut	RHS	420	40	10
24	155.440	155.640	Cut	Both sides	200	15	5
25	157.160	157.540	Cut	RHS	380	40	6

Annex A3: Outline of Culverts in Section 2B

№№	Location	Type of the construction and material	Pipe opening, m	new	Length of the structure	Soil excavation 0.65m3 to dump, soil 1 / 2 / 3 / 4 group m3	Manual soil treatment, soil 1 / 2 / 3 / 4 group m3	Backfilling by bulldozer with replacement of the soil to 20m, with layer by layer compaction with soil watering, soil 1 / 2 / 3 / 4 gr. M3	Concrete inlet and concrete blocks demolition m3
	km								
1	2	3	4		5	6	7	8	9
38	89+069	r.c.pipe	1		14.00	- / - / 6 / -	- / - / 1 / -	-	1.70
39	91+858	r.c.pipe	1,5x2		11.00	- / - / 9 / -	- / - / 1 / -	-	2.50
40	93+290	conrete box culvert	1x1		10.00	- / - / 5 / -	- / - / 1 / -	-	0.40
41	94+839	conrete box culvert	0,75x0,75		8.00	- / - / 4 / -	- / - / 1 / -	-	-
42	96+032	r.c.pipe							
43	97+242	conrete box culvert	0,75x0,75		9.00	- / - / 5 / -	- / - / 1 / -	-	-
44	97+920	r.c.pipe	1		12.00	- / - / 5 / -	- / - / 1 / -	-	0.35
45	98+835	r.c.pipe	1		17.00	- / - / 7 / -	- / - / 1 / -	-	-
46	100+589	r.c.pipe	1		13.00	- / - / 6 / -	- / - / 1 / -	-	-
47	1021+50	r.c. pipe	1.00		11.10	- / 5 / - / -	- / - / 1 / -	-	1.0
48	1028+43	concrete box culvert	0.5x0.5		11.20	- / - / 6 / -	- / - / 1 / -	-	6.5
49	1039+13	r.c. pipe	0.75		10.70	- / - / 6 / -	- / - / 1 / -	-	1.52
50	1041+22	concrete box culvert	0.8x0.8		12.50	- / - / - / 11	- / - / - / 1	-	10.03
51	1056+39	r.c. pipe	1.00		13.20	- / - / 6 / -	- / - / 1 / -	-	-
52	1063+47	r.c. pipe	1.25		13.20	- / - / 8 / -	- / - / 1 / -	-	0.8
53	1068+09	r.c. box culvert	3.0x2.5		19.40	- / - / 15 / -	- / - / 1 / -	-	4.5
54	1074+56	concrete box culvert	1.0x1.0		13.40	- / - / - / 15	- / - / - / 1	-	28.67
55	1090+64	r.c. pipe	0.75		14.30	- / - / 19 / -	- / - / 1 / -	-	2.21
56	1093+63	concrete box culvert	0.75x0.75		12.20	- / - / 14 / -	- / - / 1 / -	-	10.04
57	1106+92	r.c. pipe		1.5					
58	1127+03	r.c. pipe	0.75		15.50	- / - / 20 / -	- / - / 1 / -	-	1.2
59	1135+39	concrete box culvert	0.75x0.75		13.20	- / - / 20 / -	- / - / 1 / -	-	10.47

№№	Location	Type of the construction and material	Pipe opening, m	new	Length of the structure	Soil excavation 0.65m3 to dump, soil 1 / 2 / 3 / 4 group m3	Manual soil treatment, soil 1 / 2 / 3 / 4 group m3	Backfilling by bulldozer with replacement of the soil to 20m, with layer by layer compaction with soil watering, soil 1 / 2 / 3 / 4 gr. M3	Concrete inlet and concrete blocks demolition m3
	km								
60	1141+40	concrete box culvert	0.75x0.75		12.20	- / - / 6 / -	- / - / 1 / -	-	9.12
61	1149+46	concrete box culvert	0.75x0.75		12.00	- / - / - / 6	- / - / - / 1	-	9.0
62	1176+97	r.c. pipe	1.25		10.20	6 / - / - / -	- / 1 / - / -	-	-
63	1179+86	r.c. pipe	0.75		11.00	5 / - / - / -	- / 1 / - / -	-	0.63
64	1197+35	r.c. pipe	2x1.5		16.40	- / 30 / - / -	- / - / 2 / -	-	10.04
65	1201+86	r.c. pipe	0.75		16.50	- / 5 / - / -	- / - / 1 / -	- / - / 14 / -	0.8
66	1209+23	r.c. pipe	1.50		12.30	8 / - / - / -	- / 1 / - / -	-	-
67	1216+30	r.c. pipe	1.0		13.25	- / 5 / - / -	- / - / 1 / -	-	2.0
68	1235+18	r.c. box culvert	2x3.0x2.5		12.20	- / 4 / - / -	- / - / 1 / -	-	11.4
69	1236+29	concrete box culvert	1.0x1.0		12.00	4 / - / - / -	- / 1 / - / -	-	8.5
70	1250+59	r.c. pipe	1.0		12.30	- / 8 / - / -	- / - / 1 / -	-	5.6
71	1263+81	r.c. pipe	0.75		12.70	- / 4 / - / -	- / - / 1 / -	-	1.8
72	1267+48	concrete box culvert	0.8x0.8		12.50	- / 4 / - / -	- / - / 1 / -	-	10.6
73	1270+20	concrete box culvert	0.8x0.8		12.40	- / 4 / - / -	- / 1 / - / -	-	10.6
74	1273+74	r.c. pipe	1.25		12.20	- / 5 / - / -	- / 1 / - / -	-	5.2
75	1274+64	r.c. pipe	1.0		15.90	- / 6 / - / -	- / - / 1 / -	-	5.6
76	1276+57	concrete box culvert	0.75x0.75		12.50	- / 4 / - / -	- / - / 1 / -	-	10.1
77	1280+34	concrete box culvert	0.75x0.75		12.40	- / - / 4 / -	- / - / 1 / -	-	10.1
78	1284+49	r.c. pipe	1.25		12.20	- / 5 / - / -	- / 1 / - / -	-	5.2
79	1287+34	r.c. pipe	0.75		13.30	- / 4 / - / -	- / - / 1 / -	-	1.6
80	1291+78	r.c. pipe	1.0		9.10	4 / - / - / -	- / 1 / - / -	-	-
81	1295+57	concrete box culvert	0.8x0.8		9.20	- / 3 / - / -	- / - / 1 / -	-	7.4
82	1298+59	r.c. pipe	1.0		12.20	3 / - / - / -	- / 1 / - / -	-	1.2
83	1305+39	r.c. pipe	1.25		16.30	6 / - / - / -	- / 1 / - / -	-	6.3

№№	Location	Type of the construction and material	Pipe opening, m	new	Length of the structure	Soil excavation 0.65m3 to dump, soil 1 / 2 / 3 / 4 group m3	Manual soil treatment, soil 1 / 2 / 3 / 4 group m3	Backfilling by bulldozer with replacement of the soil to 20m, with layer by layer compaction with soil watering, soil 1 / 2 / 3 / 4 gr. M3	Concrete inlet and concrete blocks demolition m3
	km								
84	1307+68	r.c. pipe	1.0		13.20	5 / - / - / -	- / 1 / - / -	-	1.8
85	1308+72	r.c. pipe	1.0		15.30	6 / - / - / -	- / 1 / - / -	-	5.6
86	1313+26	r.c. pipe	0.75		15.13	14 / - / - / -	- / 1 / - / -	- / 21 / - / -	-
87	1313+42	r.c. pipe	1.00		13.55	- / 7 / - / -	- / - / 1 / -	-	1.24
88	1315+74	concrete box culvert	0.5x0.5		10.20	5 / - / - / -	- / 1 / - / -	-	4.7
89	1317+81	r.c. pipe	1.00		13.20	7 / - / - / -	- / 1 / - / -	-	1.24
90	1319+31	r.c. pipe	1.25		15.30	6 / - / - / -	- / 1 / - / -	-	1.32
91	1320+00	r.c. pipe	1.25		16.30	7 / - / - / -	- / 1 / - / -	-	0.65
92	1328+88	r.c. pipe	1.00		11.15	5 / - / - / -	- / 1 / - / -	-	-
93	1339+86	r.c. pipe	1.00		17.60	8 / - / - / -	- / 1 / - / -	-	1.15
94	1361+36	r.c. pipe	1.00		12.20	- / 5 / - / -	- / - / 1 / -	-	1.90
95	1370+54	r.c. pipe	1.00		12.30	- / 4 / - / -	- / - / 1 / -	-	1.24
96	1376+60	r.c. pipe	1.00		13.20	- / 14 / - / -	- / - / 1 / -	- / - / 25 / -	1.24
97	1376+66	r.c. pipe	0.75		10.40	- / 4 / - / -	- / - / 1 / -	-	0.86
98	1379+55	r.c. pipe	1.00		13.20	- / 7 / - / -	- / - / 1 / -	-	1.24
99	1384+04	r.c. pipe	1.00		13.15	- / 6 / - / -	- / - / 1 / -	-	0.62
100	1393+29	r.c. pipe	1.00		12.20	4 / - / - / -	- / 1 / - / -	-	1.26
101	1409+34	r.c. pipe	1.00		15.50	7 / - / - / -	- / 1 / - / -	-	1.26
102	1411+05	r.c. pipe	0.75		9.30	- / 3 / - / -	- / - / 1 / -	-	1.01
103	1420+48	r.c. pipe		1.50					
104	1427+64	r.c. pipe		1.00					
105	1429+46	met.box culvert	2x0.25		10.00	- / 3 / - / -	-	-	-
106	1431+40	r.c. pipe	0.75		10.20	- / 5 / - / -	-	-	-
107	1440+59	r.c. pipe	0.75		9.40	- / 4 / - / -	- / - / 1 / -	-	1.58

№№	Location	Type of the construction and material	Pipe opening, m	new	Length of the structure	Soil excavation 0.65m3 to dump, soil 1 / 2 / 3 / 4 group m3	Manual soil treatment, soil 1 / 2 / 3 / 4 group m3	Backfilling by bulldozer with replacement of the soil to 20m, with layer by layer compaction with soil watering, soil 1 / 2 / 3 / 4 gr. M3	Concrete inlet and concrete blocks demolition m3
	km								
108	1441+80	r.c. pipe		1.00					
109	1449+90	met. Pipe	1.00		10.00	- / 2 / - / -	- / - / 1 / -	-	-
110	1456+25	r.c. pipe	0.50		14.50	- / 6 / - / -	- / 1 / - / -	-	-
111	1457+76	r.c. pipe	0.75		21.30	- / 10 / - / -	- / 1 / - / -	-	0.49
112	1464+67	r.c. pipe	0.75		9.50	- / 5 / - / -	-	-	-
113	1466+36	r.c. pipe	1.00		17.50	- / 8 / - / -	- / 1 / - / -	-	-
114	1481+86	concrete box culvert	0.75x0.75		9.50	- / 7 / - / -	- / 1 / - / -	-	5.77
115	1484+61	concrete box culvert	0.75x0.75		10.55	- / 8 / - / -	- / 1 / - / -	-	6.36
116	1490+39	met pipe	0.50		22.00	- / 5 / - / -	- / 1 / - / -	-	-
117	1492+69	r.c. pipe	0.50		10.20	- / 5 / - / -	- / 1 / - / -	-	-
118	1497+35	asbestos pipe	0.35		9.10	- / 2 / - / -	-	- / - / 3 / -	-
119	1500+00	r.c. pipe	0.50		9.00	- / 4 / - / -	- / - / 1 / -	-	2.30
120	1501+75	r.c. pipe	1.00		3.00	- / 9 / - / -	- / - / 1 / -	-	-
		concrete box culvert	1.0x1.0		10.50				11.20
121	1504+14	r.c. piped=1.0	1.00		16.40	7 / - / - / -	- / 1 / - / -	-	3.4
122	1506+99	concrete box culvert	1.0x1.0		9.30	7 / - / - / -	- / 1 / - / -	-	9.45
123	1513+37	r.c. pipe	1.00		30.00	14 / - / - / -	- / 1 / - / -	-	1.80
124	1518+60	r.c. pipe		1.00					
125	1522+47	r.c. pipe	1.25		13.20	6 / - / - / -	- / 1 / - / -	-	1.45
126	1528+81	r.c. pipe	1.50		19.40	9 / - / - / -	- / 1 / - / -	-	2.09
127	1531+35	r.c. pipe	0.75		15.30	7 / - / - / -	- / 1 / - / -	-	1.45
128	1531+99	r.c. pipe	1.25		9.12	12 / - / - / -	- / 1 / - / -	-	1.68
		r.c. pipe	1.00		16.58				
129	1533+52	r.c. pipe	0.75		22.00	10 / - / - / -	- / 1 / - / -	-	1.45

№№	Location	Type of the construction and material	Pipe opening, m	new	Length of the structure	Soil excavation 0.65m3 to dump, soil 1 / 2 / 3 / 4 group m3	Manual soil treatment, soil 1 / 2 / 3 / 4 group m3	Backfilling by bulldozer with replacement of the soil to 20m, with layer by layer compaction with soil watering, soil 1 / 2 / 3 / 4 gr. M3	Concrete inlet and concrete blocks demolition m3
	km								
130	1535+28	r.c. pipe	0.75		13.20	6 / - / - / -	- / 1 / - / -	-	1.45
131	1538+04	r.c. pipe	1.00		12.40	5 / - / - / -	- / 1 / - / -	-	1.33
132	1547+19	r.c. pipe	1.00		18.50	8 / - / - / -	- / 1 / - / -	-	1.80
133	1549+11	concrete box culvert	0.75x0.75		11.20	8 / - / - / -	- / 1 / - / -	-	8.29
134	1553+90	concrete box culvert	1.0x1.0		13.40	10 / - / - / -	- / 1 / - / -	-	13.62
135	1575+95	r.c. pipe	1.00		19.80	7 / - / - / -	- / 1 / - / -	-	1.14
136	1581+14	r.c. pipe	1.00		15.40	6 / - / - / -	- / 1 / - / -	-	2.08
137	1586+27	r.c. pipe	1.00		13.20	5 / - / - / -	- / 1 / - / -	-	-
138	1589+07	concrete box culvert	1.0x1.0		13.50	4 / - / - / -	- / 1 / - / -	-	-

Annex A4: Location of Powerlines

No.	km	
1	89.3-103.3	LHS
2	103.3	Overhead
3	105.4-106.2	RHS
4	108.2 - 109.6	RHS
5	136.5 -142.475	LHS
6	137.1	Overhead
7	141.9	Overhead
8	142.475	Overhead
9	142.475 -142.030	Overhead
10	142.03	Overhead
11	142.99	Overhead
12	145.505	Overhead
13	145.505 - 146.139	LHS
14	146.139	Overhead
15	146.139 - 146.549	RHS
16	146.549	Overhead
17	146.549 - 147.2	LHS
18	148.188	Overhead
19		LHS
20	149.402	Overhead
21	149.55 - 150.4	RHS
22	150.33	Overhead
23	150.330 - 150.415	RHS
24	158.95 - 159.2	LHS

Annex B - List of Attendees in the Public Consultation in Bashkugandy

18 Mar. 2016

Attendance Sheet

No.	Full name	Position	Place of residence / Telephone	Signature
1	Chokoev Kylychbek	Deputy of Village Council	Kuiruchuk village /0772456414	/signed/
2	Korgoldaev A.	Land specialist	Kuiruchuk v/a /0773050049	/signed/
3	Nazarov Sharynbai	Retiree	Kuiruchuk v/a /0707813257	/signed/
4	Abylabekov B.	Head of Kuiruchuk v/a	Kuiruchuk village 0778715471	/signed/
5	Dyikanov B.	A.K Deputy	Jumgal /0708940053	/signed/
6	Tursunov Jalil	Member of court of aldermen	Jumgal village	/signed/
7	Bolotaliev Uzak	Jumgal v/a	Jumgal village /0771310580	/signed/
8	Sydykov Jeenbek	Court of Jumgal village	Jumgal village	/signed/
9	Smodiyarov Tynybek	Architect of Jumgal region	Chaek village	/signed/
10	Jumukov Rahatbek	Bash-Kuugandy v/a	Bashkugandy village	/signed/
11	Nusubalieva Nurbubu	Tugol-Sai v/a	Tugol-Sai village	/signed/
12	Bektemirova Baktygul	Tugol-Sai v/a	Tugol-Sai village	/signed/
13	Kokbalaev Kylychbek	Tugol-Sai v/a	Tugol-Sai village	/signed/
14	Jeenaliev Toktosun	Retiree	Tugol-Sai village	/signed/
15	Junushov Zamir	Executive Secretary of Tugol-Sai v/a	Tugol-Sai village	/signed/
16	Sadybakasov Iskender	Regional administration	Chaek village	/signed/
17	Botokanova Jibek	Bash-Kuugandy v/a	Bashkugandy village	/signed/
18	Saparov Adyl	First deputy of head of v/a	Chaek village	/signed/

Annex C – Written Comments, Recommendations and Questions

Name: Sharypbai Nazarov
Residential address: Kuiruchuk village authority
Proposals concerning the road rehabilitation project:
Please build a ditch along the shoulder of the road, which will be needed for watering agricultural land plots.
Questions related the road rehabilitation project:

Name: Kylychbek
Residential address: Kuiruchuk village
Proposals concerning the road rehabilitation project:
Build ditches along the road inside the village.
Provide for opportunities of connecting two markets.
Transfer old removed structures to the village authority.
Lay sleeve pipes for drinking water to be used by new rural communities
Questions related the road rehabilitation project:
Are there standards for prevention of road collapse in swampy areas?

Name: Nurbubu Turdalieva
Residential address: Tugol-Sai village authority
Proposals concerning the road rehabilitation project:
It would be good not to destroy cemeteries along the road to avoid discontent of local people.
It would be good if the road went around the village.
Questions related the road rehabilitation project:
Will the Contractor arrange for sidewalks?
Is it possible to build a road on swampy area?

Name: Bektemirova Baktygul
Residential address: Tugol-Sai village authority
Proposals concerning the road rehabilitation project:
Expand the road; build eight bridges, one big bridge and seven small bridges on Tugol-Sai and Epkin road.
Questions related the road rehabilitation project:
When will the construction be started?

Name: Aslanbek
Residential address: Kuiruchuk village, Zhumgal region
Proposals concerning the road rehabilitation project:
Please lay two pipes for drinking water on two places.
Please connect two markets through an underpass.
Questions related the road rehabilitation project:
Will the Contractor turnover concrete pipe culverts, old pipes to the village authority and use the same for improving roads inside the village?

Name: Zheenbek Sadykov
Residential address: 11 Rysbaev Sydyk Street, Zhumgal village
Proposals concerning the road rehabilitation project:
As the road inside the village is located close to the school, we request you to change the route of the road, for example towards Chet-Bulak.
Questions related the road rehabilitation project:

Name: Tursunov Jalil
Residential address: Zhumgal village authority
Proposals concerning the road rehabilitation project:
Please check if my house is located very close to the road. Please arrange for subway or install a traffic light in front of the school.
Questions related the road rehabilitation project:

Name: Saparov Adyl
Residential address: Baizak village
Proposals concerning the road rehabilitation project:
Please install lighting lamps inside the village.
Turn over old removed concrete pipe to the village authority.
Questions related the road rehabilitation project:

Name: Zamir Zhumushov
Residential address: Tugol-Sai village
Proposals concerning the road rehabilitation project:
Tugol-Sai – Epkin section of the Bash-Kuugandy – Kyzart road will cross the farmlands; so please provide for roundabouts. It would good if the Contractor built five bridges within the Tugol-Sai – Epkin section.
Questions related the road rehabilitation project:

Annex D – Transcript of the video recording: in Bashkuugandy, Kochkor District

Mr. Ruslan, IPIG/MOTR:
As I said, heads of village authorities should take measures to provide the list of utilities to be laid under the road to the MOTR as soon as possible. Specialists shall soon start preparing detailed project design. If you submit your proposals/requests before the start of detailed project, specialists shall identify whether it is possible to meet your requirements or not. It would be good if you have submitted your proposals/requests before April 15.

Local specialist with scale map /plan (architect):
I am holding in my hand a scale map/general plan, where every utilities and places thereof are specified in detail. We need to cooperate closely with heads of each village authority and do our best to include utilities that we need into the project, even if it is a reserve pipe for future needs. Did you understand what these people said? If we fail to submit our proposals/requests before deadline, everything will be done at the expense of our village authorities. To avoid it, we need to start working on it right now.

Local resident:
My house is between the standpipe and road. If the width of the road becomes 15 m, then my house will be destroyed, am I right?

Local specialist with scale map/plan (architect):
You have heard that specialists were working right now. They will identify whether a house/structure will be removed or not. In any case, owners of structures to be removed will be compensated. For example, I am afraid that my warehouse will be removed. Do not think that 16 m width will be coated with asphalt; there will be a shoulder uncoated with asphalt. So vehicles will not be moving close to your structure.

Mr. Ruslan, IPIG/MOTR:
You need to check that against the map. If your fence is on the road, then it will be removed. Otherwise, your fence shall stay where it is. Actually, specialists shall consider whether it is possible to expand the road to opposite side, where there is no any structure. During detailed design, specialists shall take topographic mapping and identify how many electric poles should be shifted. The same is about standpipes. If water supply pipes are under the asphalt-coated part of the road, then they will be shifted. If they are under shoulder or far from it, they will remain in their places.

Local resident:
Last summer I was cultivating my potato. A car parked close to my land and American person with translator got off the car. They asked me if I was local resident. When I said yes, they asked if there was pipe of clean water. I showed them the place where it was. Then they asked about the road to be reconstructed. I answered that the road would be reconstructed and I did not know about its dimensions. They told that they built clean water supply system and they would be controlling it.

Mr. Ruslan, IPIG/MOTR:
That was just a provocation. You know that many years have passed since this road was built. We need to find out if that was licensed or not.

Head of Bashkuugandy village authority:

Every village authority has its land specialist, architect, pasture specialist, etc. They need to cooperate closely and discuss the village's needs concerning utilities.

Local resident:
Thank you very much for your efforts. You are improving our life through improving the road. I am the elder of the Jumgal village. Since I heard that the road would be reconstructed I did not know whom I should apply to. The road shall pass near the school. The school is two-story building. You said that heavy machines would be operating during construction of the road. Is it possible to provide for bypass? We old people know where the bypass road could be arranged and can show the place. Bypass road should start from Chet-Bulak and end with Kyzart.

Mr. Ruslan, IPIG/MOTR:
Does that road cross arable lands? We need to study its soil composition and many factors. However, you may write down your request. I would like to underline that we shall reconstruct the old, existing road. We will not build a new road. You need to understand it as related to financing. Transformation of road will require much time, bureaucracy issues will arise etc. Contractor will reconstruct road according to standards inside villages. The same standards were applied during construction of the road in the city. Therefore, there is no need to worry about it. In no way shall the Contractor damage public structures, he carries out construction operations according to standards and with due care.

Head of Bashkuugandy village authority:
We already applied concerning a bypass road. Specialists came, examined that road you were telling about and drew a conclusion that it was unsuitable. Mr. Ruslan you should be honest, you are asking us to write down our proposals despite the content thereof. If you are not able to fulfill them, you should not say so. You should be straight and tell that the old/existing road will be reconstructed and no bypass is allowed. (Addressing to local residents) If we, local residents, request to arrange for a bypass road, transformation process will take 6 months-1 year at least and we will lose 2-3 years as a result. Donors' specialists came and examined all possible bypass roads, conducted physical analyses and concluded that they were unsuitable. In addition, they told that if reconstruction of old road required for instance 900 000 000 USD, constructing additional bypass roads would require 3 times as much. Therefore, they refused to build bypass roads.

Local residents are discussing:
Mr. Ruslan told to write down your request concerning the bypass road just to be polite. In fact, no by pass road will be arranged. We need to tell so to our people.

Local resident:
My question is whether our Bashkugandy village will be covered by the project. You were telling that the road would be reconstructed to Bashkugandy village.

Translator:
We were telling that the section 2 would end in Bashkugandy village. However, there are sections 3 and 4 and Bashkugandy village road will surely be reconstructed.

Mr. Ruslan, IPIG/MOTR:
Do not be confused. We divided the road into sections just for the reason that one donor cannot finance all sections. There might be 4 different donors, or might be 3, which will finance by one or two sections of the road. Bashkugandy is surely included into the project. Currently specialists are identifying how many structures will be removed in your village. I hope that financing matters

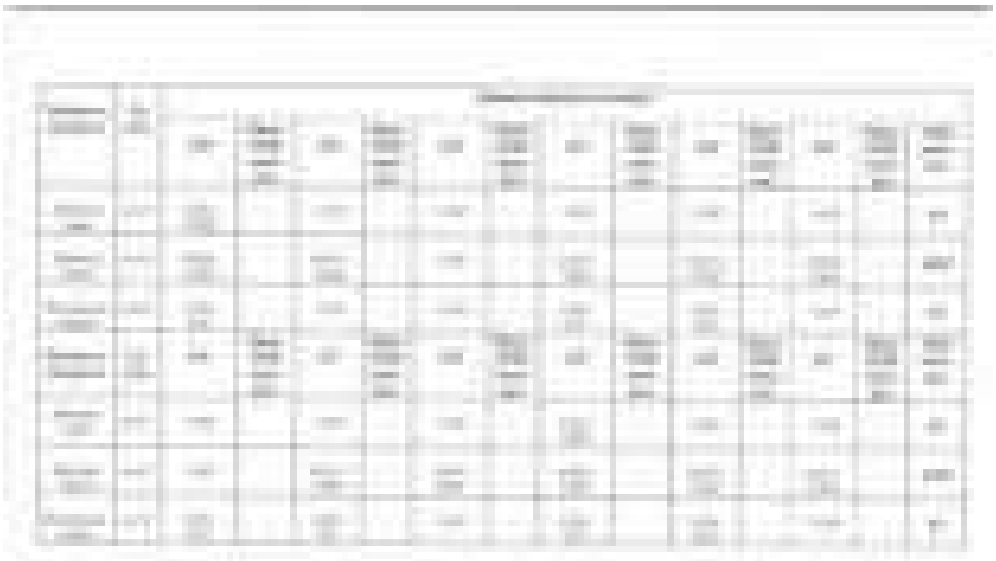
will have been solved by the end of the President's period of service and our President is also making great efforts in that direction.
Last time I asked to provide your proposals in written. Unfortunately, the MOTR has not received any proposal/request by now. I currently do not know how many pipes should be laid and how many traffic lights should be installed in your village. Once again, I repeat make sure that you have submitted your written proposals by April 15, so we could be able to include them into detail design.
As for underpasses, please decide at first, which is better for you – traffic light or underpass; and then include it into your official request. I would like to note that underpass eventually turn into toilets, for example those in the city. Therefore, you need to decide about it.

Local resident (woman):
Thank you for your coming. We understood your purpose; you are trying to help us. We, local residents, try to include our little requests into your project as usual. (Addressing to local people) We need to sit down and prepare a list of our proposals within two days instead of doing the same until April 15. You may be concerned about cemeteries, I am sure builders are smart people; if they need to expand the road they will do it to opposite side, where there is no structure. The same is about the school you were telling. If you keep on quarrelling, you will lose time and make donors to lose their time. Stop doing so and calm down.
(Addressing to local translator) Please say great thanks to our guest for his assistance in reconstruction of the road.

Head of Bashkuugandy village authority:
We have been looking forward for reconstruction of Jumgal's road. Thanks God, it is about to be reconstructed. Therefore, all residents, we need to support this process by correct explaining it to our villagers. Heads of each village authorities, please support the resettlement/removal process through your land specialists, accompany donors' specialists and explain everything to owners of structures to be removed/shifted to speed up the reconstruction process.

Annex E – Results of laboratory analysis

1. Air quality



2. Water quality

3. Noise

4. Vibration

Annex F: Conclusion of the Ministry of Culture and Tourism, KR

Annex G: Information letter from MOTR

Долбоор жана долбоордун [illegible]
[illegible]

<u>Балыкчы ш., Таш-Сарай жана Орто-Токой айылдары.</u>

Кочкор району:

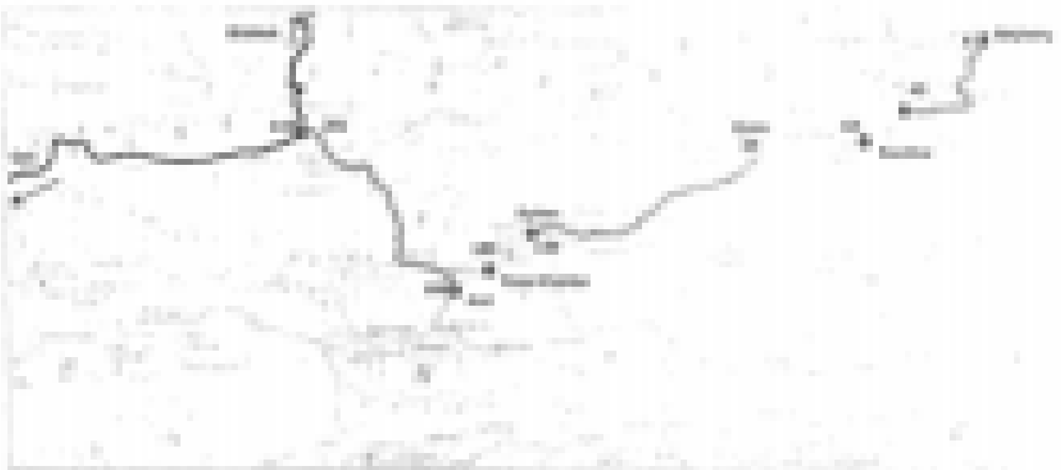
1. Кок-Жар а/а – Кок-Жар айылы
2. [illegible] а/а – Чекилдек айылы
3. Чолпон а/а – [illegible] айылы

Жумгал району:

1. Жумгал а/а – Жумгал айылы
2. Куйручук а/а – Куйручук айылы
3. Туголь-Сай а/а – Туголь-Сай айылы
4. Баш-Кууганды а/а – Баш-Кууганды, Кырчын айылдары
5. Байзак а/а – Байзак айылы
6. Чаек а/а – Чаек, Ак-Татыр айылы
7. Кызыл-Жылдыз а/а – Кызыл-Жылдыз айылы

Жайыл району:

Суусамыр а/а – Кызыл-Ой, Кожомкул, Суусамыр, Тунук айылдары



Кыргыз Республикасынын Өкмөтү Азия өнүктүрүү банкынын (АӨБ) КАРЭС [illegible] 1 жана 3-коридорлорун [illegible] [illegible]

[illegible] 5 участкага [illegible]:

- [illegible] километр [illegible] километр [illegible].
- [illegible] 25 км;
- [illegible] 79 км;

- Дүйнөлүк аймактардын тармагы (159-км) Кытай-Жакында аймагынын чөйрөсү (182-км), Аксыйнын 24-км, маанай Чаек айылын жана Кытай-Жакында аймагынын бир бөлүгүн айлана өтүү үчүн айлана жолду курап чыгууда жок.
- Арыктуун тармагы (199-км) Тянь-Аксуу мамлекеттик чөйрөсү (209-км), Бейшеке поселе 91-км.

Долбоордун алкагында мамлекеттик коомдоштуктун сунуштары изилденүүдө. Ошого карата айрым деталдарда өзгөчөлүктүү жетишүү таяк маанилүү, анткени төмөнкүлөр керек: (i) Кыргыз Республикасында акыл активдерин башкаруучуну өнүктүрүүнү жогорулатуу, (ii) жеңилүү транспорт операторлорду жөнгө салуучулук реформалар менен коштоо, (iii) автомобилдүүлүк коопсуздук көйгөйүн комплексүү чечүүгө киришүү (iv) Кыргыз Республикасында экологиялык коргоону жогорулатуу.

Транспорт жана коммуникация министрлигинин (ТжКМ) карамагы Инвестициялык долбоорлорду жана жөнөкөй тобу (ИДЖТ) курулуш бизнесинин уюлу долбоор бөлүгүн Аткаруучу органы (АО) катары чыгат. Мурунку болуучу финансылык жардамдын бөлүгүнө ээ болуу катары, АОБ бүтүндөй долбоор үчүн техникалык-экономикалык негиздөөнүн жана баалоонун долбоордук документтерин үчүн «Бова Консультэнт Гмбх», Германия, жалпысы Консультациялык кызмат көрсөтүүлөрдүн келишим боюнча экологиялык сактоонун (ЭСК), жана социалдык таасирлер жана экологиялык талдоонун жана 2009-жылдагы №16 Кеңешмелер сакталы жөнүндө Буйрукуна (ЭСК) ылайык коопсуздукту башкаруу планын.

Сунушталып жаткан долбоор Кыргыз Республикасынын региондорунун инженердик-экономикалык көрсөткүчтөрүн жакшыртат:

- Түштүк регионунан Нарын жана Ысык-Көл облустарынын аймактарын жана төмөнкүдөн жогорулатуу менен аткаруу убактысын кыскартуу.
- Кыргызстандын жана жакын жана алыстагы аймактарынын байланышуу транспорт чыгымдарын азайтуу.
- Кыргызстандын жана ага аралаш тандоолорун жана сыйымдуулугун көбөйтүү.
- Жергиликтүү ишканалар үчүн конкурсчу көрүнүш алып келүүчү мүмкүнчүлүктөрдүн пайда болушу.
- Жаңы жумушчу орундарын түзүү.
- Транспорт каражаттарынын (ТК) ак ыкмы Пайдалануу чыгымдарын кыскартуу.

Кыргыз Республикасынын майнаардын ылайык коргоо түрлөр чөйрөсү тизмесине баалоо жүргүзүү керек. ТЭБ башкарыла коргоо түрлөр чөйрөсү тизмесине баалоо ылайык Экономикалык-экологиялык жетекчилик (ТЭБ) коргоо Коргоо түрлөр чөйрөсү тизмесин ишке ашыруучу (КЧТИА) катары кароо жана ЭЧБ-нчөгү чыгып чыгышы.

АОБ Кыргыз Сакалы биосфера Жайлоосуна аймагынын алдын (2009) долбоор II [Da] категориялык жүрүп жана коргоо түрлөр чөйрөсү тизмесин кошо баалоону (ЭЧБ) талап кылабыз. АОБ «Ак категориялардагы долбоорлор үчүн аймактын алдын Баалоонун экологиялык баалоону (ЭЧБ) даярдап жүрө.

Кыргыз Республикасынын майнаардын алдын долбоорду категориялар үчүн өзгөчөлөнүп, берок ЭЧБ жана ЭЧПЖБ документтерин бирдей талаптагы сапаты керектелбейт.

Экология жана Сорголоон Башкармасы министрлиги

- Ар кандай түз жана кайыр экологиялык көйгөйлөрүнүн алып салууларын жана же жана баалоо жана ошол жана Байланышуу экологиялык аспектилерди аткаруучу болуучу кубултуу;
- Долбоордун ЭЧБ/ЭЧПЖБ даярдоо
- Жергиликтүүлүктүн коргоо жетекчилигинин алдын (ЖКЖ) даярдоо.

Үчүн ЭЧБ/ЭЧПЖБ жаңылыгын кубултуучу жаңыдан долбоорлуу түрлөр түрлөр чөйрөсү, ага кошумча, консультация өткөрүлүүгө тиешелүү баалоо жана экологиялык көзөмөл Бөлүп көрсөтүү. Экологиялык баалоо процессинде, коргоо жетекчилик кубултуу жаңыдан

[illegible] байланышту курап турган чейрек эң ылдый сызыгы жаткан жайгашкан таамандар болгонунан кем. БӨЛҮНҮҮ бөлүгү үйдүн фундаментин курап турган аралыктагы жергиликтүү [illegible] материалдарга жана конструкциялар (же жайгашкан жерлерде жыгачтан жасалган) бөлүгүнө бөлүнүшү керек. Бул [illegible] бөлүктөрдү [illegible] жана жыгачтан жасалган [illegible] жана [illegible] жана [illegible] жана

- Жолдун жалпы узундугу: 10.00 м

- Ар кыймылдуу аралыктар:
- Тилкелердин саны: 2
- Тилкенин кеңдиги: 3.5 м
- Ортоңку тилкенин кеңдиги: 7.00 м
- Жолдун четинин кеңдиги: 2.5 м (анын ичинен 0.50 м тилкенин)
- Жолдун жалпы узундугу: 12.00 м

Күрөөнүн турган чөйрөсинен күтүлүүчү таасирлерге жана ал жаатында болгон тарыхтар.

Таасирлер.

Жол кыймылдуу таасирлерге карата бирдей эмес сезгичтикке ээ. Кээ бир таасирлер башкаларга караганда маанилүү. Ар бир таасирдин потенциалдуу таасирин түшүнүү, ошондой эле аларды жеңилдетүү же жок кылуу үчүн кандай чараларды көрүү керектигин түшүнүү маанилүү.

Төмөнкүдөй таасирлер каралган:

(i) ачык-чачык таасирлер, бул таасир катышуучу объект таасирлердин натыйжасында түз өзгөрүүлөрдү билдирет. Бул таасирлер жолдун курулушунун убагында жана андан кийин пайда болушу мүмкүн. Мисалы, таасирлер пайдубал тилкелерин, жолдун бетин, жол чектерин, дренаждык системаларды, жол белгилерин, жол чырактарын, жол тосмолорун, жол белгилерин, жол чырактарын, жол тосмолорун, жол белгилерин, жол чырактарын, жол тосмолорун