

Environmental Management Plan

Project Number: L3056/G0366
January 2016

KGZ: CAREC Corridor 3 (Bishkek–Osh Road) Improvement Project, Phase 4 (Performance-Based Management Contract; Kara-Balta– Suusamyr [68.5 km])

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Prepared by the EPTISA Servicios De Ingenieria for the Ministry of Transport and Communications of the Kyrgyz Republic and the Asian Development Bank.

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Asian Development Bank
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*Subject: CAREC Corridor 3 (Bishkek-Osh Road) Improvement Project
Performance Based Contract: Kara-Balta – Suusamyр (68.5 km).
Environment Management Plan (EMP).*

The Ministry of Transport and Communications of KR approves the Environment Management Plan prepared under the CAREC Corridor 3 (Bishkek-Osh Road) Improvement Project Performance Based Contract: Kara-Balta – Suusamyр (68.5 km) and you are kindly asked to post the document on ADBs website.

The document was prepared according to the requirements of the Asian Development Bank and considering the possibility of implementing and monitoring from MOTC side.

The Ministry of Transport and Communications of KR deems that the Environment Management Plan can be updated during implementation if needed, subject to preliminary agreement with ADB.

Respectfully,

Deputy Minister

U. Uezbaev

№ 019749

Ministry of Transport and Communications of the Kyrgyz Republic

Environmental Management Plan

CAREC Corridor 3 Bishkek-Osh Road Rehabilitation
Performance Based Management Contract; Kara-Balta –
Suusamyр (68.5 km)

January 2016

This Environmental Management Plan (EMP) has been prepared by
EPTISA Servicios De Ingeniería S.L./ Eptisa Muhendislik / RAM for MoTC.

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Project Details

<p><u>Project title:</u> Central Asia Regional Corridor 3 (Bishkek-Osh Road) Improvement Project Phase 4 for Engineering and Construction Supervision</p>	<p><u>Client:</u> Ministry Transport and Communications of the Kyrgyz Republic (MoTC)</p>
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1. Designation

The project CAREC Corridor 3 Bishkek-Osh Road has been assigned to B-category and the Initial Environmental Examination (IEE) was prepared. As the Performance Based Management Component has been added to the original project scope, it was required that the IEE be updated in accordance with ADB's SPS 2009. Due to the small-scale of impact magnitude and the nature of activities, it was agreed between ADB and the Ministry of Transportation and Communication (MoTC) that a simplified Initial Environmental Examination (IEE) in a form of an environmental management plan (EMP) would be developed. This project does not require any environmental assessment under Kyrgyz law. Under Kyrgyz law No. 60 of 13/02/2015, no environmental assessment of any type is required for standard road maintenance work.

2. The Performance-Based Contract

This project is being developed as a performance-based-contract dealing with the basic maintenance of an existing and operating national highway between Kara-Balta and Suusamyr. The existing average daily traffic volumes ranges from 8000 to 13.000 veh/d, of which between 8% and 22% are buses and trucks¹; in other words a heavily travelled road.

The work will involve simple highway maintenance activities including:

- cleaning/sweeping of the carriageway and shoulders,
- patching and crack sealing,
- cleaning and replacing of damaged road signs, road markings,
- local short distance resurfacing and surface dressings Works;
- pothole repair; and,
- repair of damaged retaining walls.

No work is to take place outside the existing carriageway-shoulder width of the road and no new construction or realignment is proposed. Further, no slope cutting of filling will be undertaken, rather clean up at pre-existing destabilized slopes and possible repair work may be conduction, based on road safety issues.

3. Project Area Description

The project road is a section of the Bishkek-Osh corridor from km 61 to 129.5, located in the Chui Province, Jayil rayon. Total length of project roads is 68.5 km and a detailed inventory of all assets along the road, including structures, signs and culverts, pipes is found in Annex 6 of the contract technical specifications.

Starting at the roundabout before the access road to the city of Kara-Balta at km 61 up to km 95, the road traverses relatively flat and open terrain, with some agricultural land use on either side of the highway. After km 95 the alignment becomes more undulating as it enters the mountainous terrain, with steeper grades and more curves in the road. The only settlement crossed is Sosnovka village. Besides, there are such villages as Kairma, Bekso-Zhol, Bekitai located 150-400 meters far from the project

¹ Traffic counts carried out by MoTC in 2014, as part of the "RAMS" project financed by World Bank

road. The only access to the core road network of the residents of those villages is this road.

The final section between Km 95 and 129.50 is located in mountainous terrain, without any settlements or human activity. This road section has steep slopes and sharp bends, with the peak altitude above 3300 m at the tunnel gates, which is at Km 129.5 and the end of the contract.

3.1. Physical Environment

The project road section is located in the mostly flat-lying alluvial-proluvial Chui intermountain valley, at the foot of the alpine region. The road Kara-Balta - Suusamyр is oriented in longitudinal direction. The project road sections slopes steadily toward the north starting at 3,300 m at the entrance to the Suusamyр Tunnel and ending at 800 m above sea-level in Kara-Balta.

The project is located within a High Risk Seismic Zone (9-point) and coupled with high soil erodability steep slopes and large cuts between Km 97 and 129 are a constant environmental concern related landslides and earthquake induced slope slips.

Annual precipitation along the project section is about 450 mm, with 60 days of winter events (snow fall), in the mountainous area of the project.²

3.2. Ecological Environment

The project is located in a semi-arid zone, with a long cold season. Frosts in the mountain section start as early as October and occur till late May. Near Kara-Balta, in the Chuy River valley, the winter is shorter, and lasts between December and April.

Land use within the area of influence of the Kara-Balta-Suusamyр road section is mainly agricultural in its first flat section. Cultivated crops near Kara-Balta are mainly wheat, feed and technical crops, different kinds of vegetables like potatoes, peppers, carrots, water melons and egg plants and fruit plantations like apple trees and apricots.

In the mountainous section, human activity is limited to breeding with herds of horses and sheep. The landscape changes to steppe and the soil is covered with grasses and low shrubs such as saxaul. Chiy, a common grass with whitish, cane-like reeds, is also common.

The PBC road corridor (Kara-Balta to Suusamyр) does not interfere with any waterways, wetlands or sensitive areas.

Sensitive Areas- As stated earlier the REA, the project road section does not pass over, through or beside any designated sensitive ecological areas. The existing road passes through Sosnovka, a village of around 5000 people. Besides there are such villages as Kairma, Bekso-Zhol, Bekitai located 150-400 meters far from the project road. Since the road is not expected to generate new traffic, new safety measures other than better enforcement of speed limits and provision of crossing areas, are not expected to be applied. Through the village speed limits are posted as 40 kph, which will be enforced once the road is repaired.

The Kara-Balta River- Between Kara-Balta Town, through Sosnokova and on to the boundary of the project, the existing road crosses the Kara-Balta River 22 times. These crossings are all bridges. Kyrgyz Republic Decree No. 561 (7/09/2009) "On fisheries development and use of natural and artificial water bodies in the Kyrgyz Republic" classifies the Kara-Balta River as a fishery water body. In other words the river has native fishes and is a recreational fishing water, most likely further upstream beyond the project boundary, where it runs through a relatively flat

² Information has been taken from the Climate Change Adaptation Report of the Consultant submitted to IPIG on 31.07.2015.

area. This category of river is given a level of protection that includes no aggregate mining, and no construction of obstructions, dams, or installation of water conveyances that prevent fish movement³.

The Kara-Balta River should therefore remain off limits for any work, other than erosion protection to limit sediment flow into the river.

Since roadside ditches will be repaired, diversion of runoff water to grassed or field areas before emptying into the river would help to improve water quality and fish habitat. This will however be difficult since the drainage from the road will not be modified, as no new culvert crossing will be placed, and working in the area can lead to exposed earth and more sedimentation and erosion.

3.3. Social Environment

The Project road section starts at the exit to Kara-Balta, the main market town and business center for the rayon (provincial) centre. It then runs through mainly open fields, passing the settlement of Sosnovka at km 86. The next village is located on the other side of tunnel, about 40 km after the end of the project, in the Suusamyry valley.

The road plays an important role in the transport system of Kyrgyzstan, being the only all-year open road connecting the northern part of the country, where the capital Bishkek is located, to the South and the country's second largest town of Osh. Therefore, good maintenance and operation of the road section, to allow free flowing traffic in all seasons is critical to the political and economic life of KR.

Much of the traffic along the road is long-distance transport, and the road is used by local villagers who live on the southern side of tunnel, outside the project area. These residents do however depend on the highway to get their products to markets in Kara-Balta and Bishkek.

4. Scope of Work

The road is presently maintained by the MoTC's maintenance unit in charge of that road section. This work will continue without appreciable changes, except for the improvement in regularity and quality of maintenance.

The scope of PBC work is to maintain the road over 3 years, with implementation of the required routine and periodic maintenance works, unchanged from the past. The level of service that the road has to provide during the contract period is defined in the contract in terms of quality of the carriageway (cleanness of the carriageway, number of potholes, cracks, rutting) and road assets (presence of road marking and signalization, etc.). The quality of the maintenance activity will be monitored by the Construction Supervision Consultant (CSC), with monthly payments tied to the quality of the maintenance as defined during the monthly inspections.

During the three years, the physical maintenance works on the whole section will be:

- Routine Repair of Pavements (pothole patching, crack sealing, cleaning)
- Cleaning and repair/replacement of signs and road safety furniture
- Cleaning and repair of culverts and grading and levelling of earth ditches to ensure the run-off water flow without obstruction.

³ Although not verified, much of the sewage from Kara-Balta and Sosnovka likely ends up in the Kara-Balta River.

- small concrete repairs to manholes and pipes in case of deterioration
- Vegetation control limited to grass cutting (mainly in the flat area), along the shoulders, but no herbicides will be used.
- Slopes stabilization (cuts and embankments) and removal of loose material
- Cleaning and small repairs to structures
- Road Surface cleaning during winter season, including spreading of sand and limited quantities of salt

All of these activities are currently carried out by the territorial subdivisions of the Ministry of Transport through the traditional maintenance arrangements, but will be contracted to a private contractor for the three years.

4.1. Work Details

Of the seven maintenance activities the following are defined in more detail.

Cleaning and Repair of Drainage Structure- There are a total of 69 culverts along the project road section facilitating road runoff as well as drainage from one side of the road downstream to another. Those structures have no flow during the summer season where repairs can be made without affecting the seasonal flows. Culverts are precast concrete and will be cleaned manually. Small concrete repair works may be needed at the outlets (in case of scour) or inside the pipes (at the joints between culvert sections). Repairs are expected to take up small volumes of materials for each structure (about 20-50 kg of concrete), mixed by hand on in a small concrete mixer, and placed and finished manually. All ditches are earth ditches, and works consist in removal of dirt and debris and eventually grading to ensure a smooth water flow. Without this maintenance the culverts will likely clog leading to flooding, road overtopping, erosion and potentially traffic delays. Therefore this activity has a net positive impact.

Vegetation Control-In the flat sections between km 61 and 85 (between Kara-Balta and Sosnovka) the road is located on a small embankment, about 0.5-1m high, next to agricultural land. The shoulders are unpaved, and the berms and slopes are grassed with natural vegetation. Due to the climate and type of mountain flora, the vegetation usually does not growing above a height of 30 cm, which does not require any intervention. In places, where the grass exceeds such height, the grass will be cut manually, by the contractors or the owner of the adjacent fields. That vegetation is usually used as livestock fodder. No herbicides will be used.

Slope Stabilization (Cuts and Embankments) Removal of Loose Materials-The highway section between km 104 and km 129.5 has increasingly large cut areas. These are areas with mixed profiles i.e., the road has been built across a hillside such that one side is cut and the other is an embankment. Due to rain (infrequent), unstable soils, frequent tremors, the cut areas are subject to landslides. Therefore, the work of the contractor will be to locate unstable areas and remove the loose material and to clean the carriageway and rock and earth debris to a designated storage area, where it can be processed and reused. The contractor will then be required to contact authorities who will stabilize the slope.

Cleaning and Small Repairs to Bridges, Culverts and Retaining Walls: There are 26 Bridges, 10 Culverts and 5500 m of existing retaining walls along the 68.5 km project road. The bridges cross the Kara-Balta River itself, while the culverts are drainage structures directing surface runoff during the rainy season and from snow melt, into the Kara-Balta River.

Bridge Repairs will involve mostly safety related repairs such as restoration of guardrails after accident or collision. Works in the river beds should be limited to cleaning debris that has fallen into the stream and could lead to blockages, flooding and erosion. Concrete repair works are not in the scope of work of the maintenance contractor, however they may happen occasionally, after emergency situations, e.g., if the structures is damaged during a flash-flood event or vehicle accident.

Retaining Walls- As part of the inspection of the retaining walls any cracks or weaknesses will be reported and repairs undertaken, depending on the severity of the condition.

This work will be completed within the road RoW and no works on bridge decks or piers will be undertaken and any in-water work will be to clear debris that is hampering proper drainage.

4.1.1. Special Work for Year 1 and 2

During the first two years of the PBMC work the contractor is expected to concentrate on carrying out initial rehabilitation works to bring the following selected road sections up to an acceptable standard. This work will be:

1. The rehabilitation of km 108 – 112, and 2 additional kilometers (exact location to be defined) involving:
 - i. the demolition of existing asphalt layers (5 cm + 8 cm) up to the gravel base, using a backhoe and jackhammer attachment. The excavated material will be broken up and stored at the side of the road within the RoW, then reused as fill for the shoulders. Excess material, if any, will be transported to the adjacent local road and used for local road surface stabilization.
 - ii. scarifying (loosening of the top 10 cm) of the road surface, levelling and compacting this layer, in preparation for the placement of a new asphalt layer.
 - iii. placing of a bitumen tack coat and placing of base and surface asphalt layers according to the materials specifications.
 - iv. reinstatement of shoulders using the excavated material, repairing ditches, painting road traffic lines, and erecting traffic signs. Traffic signs in good condition are to be reused where possible. Signs in poor condition will be disassembled and transported to an agreed dump site or given away as scrap metal.
2. Basic Road Repair from km 61-70 and km 80-90, and 2 additional kilometres (exact location to be defined), involving:
 - I. patching of existing potholes using chipped excavated materials and waterproofing via bitumen emulsion; and,
 - II. reinstatement of shoulders using the excavated material, repairing ditches, painting white lines, erecting traffic signs. Traffic signs are to be reused where possible (in good condition). Signs in poor condition are dismantled and transported to an agreed dump site or given away as scrap metal.

4.2. Application of Better Environmental Safeguards

With the implementation of the PBMC contract, the works will be contracted to a private contractor, not the government unit, and who will be paid on the basis of acceptable performance. Hopefully the quality and environmental sensitivity of the work will improve, while the physical tasks will remain the same. Unlike the current practice, the EMP prepared will be part of the works contract, thus improving contractor's environmental sensitivity, avoiding possible negative impacts.

5.0. The Screening Checklist

an environmental screening checklist was prepared to guide the development of an EMP, based on field visits.. According to KR law (N°60 of 13/02/2015): no formal environmental assessment of any kind is needed.

Table 1: Screening Checklist

SCREENING QUESTIONS	Yes	No	Severity	Remarks
A. Project Pre-Construction and Sighting			1=marginal, 5=excessive	
A-1: Is the project corridor as defined by the Road RoW and the boundary specifications within 2 km of any of the following environmentally sensitive areas?				
1. cultural heritage site		X		The road is located in open field. No cultural heritage has been registered by Kyrgyz authorities in the project area.
2. buffer zone of a protected area		X		The landscape either side of the road is either agricultural land (fields with cereals, feed or vegetables) or steppe, with limited vegetation, grass and shrubs.
3. significant wetland providing important habitat		X		
4. old-growth forest		X		
5. special area for protecting biodiversity		X		
A-2: Is the Project area ...				
6. in densely Populated district(s)?		X		
7. in potential Conflicts with other Development Activities		X		
8. inside or very close to boundary of a tribal or indigenous people area		X		The is only one settlement with < 5000 inhabitants without indigenous people on the project road
A-3: Will Bridge Rehabilitation work lead to:				No Bridge Rehabilitation Works
9. loss of agricultural lands		X		
10. deterioration of local environmental conditions		X		
11. require temporary crossings thus degrading land in vicinity of crossings		X		
A-4: Will new culverts need to be installed or fully replaced.		X		No New Culverts Expected
B. Project Construction and Operating Periods				
B-1: Will a project lead to:				
Construction Period				
12. encroachment on historical/cultural areas?		X		
13. disfiguration of landscape by road embankments, cuts, fills and quarries?		X		
14. encroachment on precious ecology (e.g. sensitive or protected areas)?		X		
15. alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams/canals affected by increased soil erosion at construction sites?	X		1	May occur marginally in case of cleaning of stream under bridge crossings, flushing of existing culverts
16. pollutant discharges into streams, including oil and fuel wastes, plus spilled cargo as well as construction materials spilled into the waterway during construction?	X		1	May occur marginally or incidentally during surface dressing works. During surface dressing, the bitumen emulsion (water mixed with bitumen) is applied to the carriageway using a hand-held sprayer and emulsion is stored in a cistern. The emulsion is sticking to the carriageway, but in case it is applied in too high concentration, the excess can run-off to the ditches. The works control should ensure appropriate spreading rate of the bitumen emulsion, as well as good condition of the emulsion tank to avoid spillage or leakage, as specified in the technical specifications of the contract.

17.	deterioration of environmental quality (incl. surface water quality) on the territory adjacent to a construction camp – household wastes, storage platforms for chemicals used in construction?		X		The existing depot in Sosnovka should be used and upgraded. No "construction camp" required. The depot shall consist indicatively of office facilities (100m ²), open parking for vehicles and plant (300m ²), closed stores (50m ²) and garage (50m ²) and a storage platform for sand (200m ² for winter maintenance). According to the specifications of the contract, the contractor shall conclude an agreement for solid waste collection and sanitation disposal. Storage of fuel, oils, paint and bituminous products shall be kept to a minimum and be located in the separate covered store room with waterproof flooring.
18.	increased local air pollution due to rock crushing, crushing, cutting and filling work, and volatile chemicals discharged into the air from asphalt production?		X		Only marginal asphalt works planned using asphalt produced in registered asphalt plant, away from the site.
19.	noise and vibration due to ANY construction works?	X		1	Noise may occur marginally for truck transport (winter maintenance) and during rehabilitation works (removal of asphalt using digger and saw cuts). There is no use of milling machine (not available in this area). No vibration is expected.
20.	dislocation or involuntary resettlement of people		X		No resettlement shall be required
21.	other social concerns relating to inconveniences of living in project corridor during construction and operating period		X		The only settlement passed by the road is Sosnovka village. In the section crossing the village, only maintenance works on the carriageway will be performed, there are no structures and no rehabilitation / surface dressing works located there.
22.	hazardous vehicle movement conditions on the sections where repair works are undergoing on the existing road?		X		Maintenance traffic on the road is minimal compared to existing traffic and integrated into the main flow. Where maintenance vehicles stop for work, appropriate signalisation shall be put in place.
23.	poor sanitation and solid waste disposal in construction area and work sites, and possible transmission of communicable diseases from workers to local populations, or development of insect-borne diseases?		X		The contractors depots will be inspected and brought into compliance with KR and ILO standards. Contracts shall be concluded by the maintenance contractor for disposal of all solid waste and sanitation. None of the road occurs in areas where there is standing water or where the climate allows insects such as malaria and dengue fever mosquitoes to exist
Operating Period					
24.	increased risk of accidents associated with increased traffic volume leading to greater no. of spills of toxic and Haz. Materials and loss of life?		X		Maintenance traffic on the road is minimal compared to existing traffic and integrated into the main flow. No additional traffic flow is generated by the road maintenance.
25.	increased noise and air pollution resulting from traffic volume increases?		X		Traffic volume along the road increases steadily, at the average rate of traffic increase in the KR, about 5% annually. The traffic increase is generated by the economic growth of KR, independently of the project, no additional capacity is created.
26.	significant increase in risks of environmental damages due to the need		X		No new bridges and culverts are created.

for large number of new bridges and other water crossings?				
Score Total	3	25	3	
Additional Comments	The project consists in replacing the current arrangement for maintenance contracting with performance-based maintenance. Activities remain the same, but the approval and payment mechanism differs			
Environmental Assessment to be Undertaken	Category C			

Additional Questions:

Legislative and Enforcement Capacity (1= least; 6=best)	1	2	3	4	5	6
Does the country have specific environmental assessment legislation, including specific instructions for environmental management plans?					X	
Does the country have supporting environmental standards and enforcement regulations/decrees?				X		
Is there the technical capacity to effectively implement the legal instruments?				X		
Is there a well established history of enforcement			X			
Summary Comment: Unlike large construction projects, there has been little or no environmental monitoring for maintenance activities, particularly when routine maintenance is involved. The EMP does exist in the legislation of the KR, but capacity in the field for environmental monitoring has to be strengthened. A minimum ½ day workshop on environmentally acceptable construction practices focusing on the work items discussed in more detail above- both for maintenance and rehabilitation, for both the contractor and the CSC team will be planned prior to the start of the works.						

Climate Change and Disaster Risk Questions The following questions are not for environmental categorization. They are included in this checklist to help identify potential climate and disaster risks.	Yes	No	Remarks
<ul style="list-style-type: none"> Is the Project area subject to hazards such as earthquakes, floods, landslides, tropical cyclone winds, storm surges, tsunami or volcanic eruptions and climate changes ? 	X		The project is partly located in steep mountains, where landslides occur regularly
<ul style="list-style-type: none"> Could changes in temperature, precipitation, or extreme events patterns over the Project lifespan affect technical or financial sustainability (e.g., changes in rainfall patterns disrupt reliability of water supply; sea level rise creates salinity intrusion into proposed water supply source)? 		X	Landslides in mountainous terrain occur and are cleaned as part of maintenance, without road disruptions
<ul style="list-style-type: none"> Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (e.g., high incidence of marginalized populations, rural-urban migrants, illegal settlements, ethnic minorities, women or children)? 		X	
<ul style="list-style-type: none"> Could the Project potentially increase the climate or disaster vulnerability of the surrounding area (e.g., by using water from a vulnerable source that is relied upon by many user groups, or encouraging settlement in earthquake zones)? 		X	Independently of the maintenance project, but as part of regional climate change (see Consultant's climate change report for Bishkek-Kara-Balta), the number of extreme events (heavy rains) is increasing in the project area, with additional risk of landslides. The contractor shall have to make additional efforts to maintain the road open to the general public at all times and dealing with emergency situations.

Conclusions: The project including only maintenance activities should not be affected by climate change, therefore no action are needed.			
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1. Photos of the project area

Start of project - flat section after Kara-Balta	Galleries protecting the road from landslides
	
Road moving uphill to the tunnel	Entrance to the tunnel - end of Project
	
Examples of unstable slopes	Material filling ditches across retaining walls
	
Example of landslide with concrete guardrail	Example of landslide without retaining wall
	

6.0. The Environmental Management Plan (EMP)

The maintenance contract will consist of many small tasks requiring the use of lubricants, and small quantities of hazardous substances such as bitumen and fuels for construction vehicles, and under varying climatic conditions. While there is little chance that negative impacts will result from the maintenance work, a basic Environmental Management Plan has been prepared, defining actions/impacts, mitigative measures and monitoring tasks that the contractor and CSC will need to implement during the 3 years.

It is hoped that the actions defined in the EMP (Table 2), which can be used as a code of environmental practices, and will be adopted permanently by whomever continues the road maintenance after this PBMC contract is over.

6.1. Technical/Legislative Capacity and Enforcement

While all legal instruments necessary to regulate and enforce environmental safeguards relate to road maintenance are in place both at the national and local levels, they have not been enforced as maintenance was always carried out by Ministry's own staff. One government agency does not enforce requirements in another agency!

The EMP will become a legally binding part of the PBMC, making enforcement of environmental safeguard requirements easier. As defined by ADB, and using the EMP to prepare a compliance-monitoring checklist, an independent specialist will complete a semi-annual due diligence audit. This audit report will be submitted to the Project Management Unit for submission to ADB.

Using the EMP's monitoring table and simply replacing the last 2-3 columns with headings such as 'outputs identified' and 'effectiveness of actions', a compliance monitoring checklist matching the EMP and its numbering can be easily prepared.

6.2. Implementation Arrangements and Timetable

The EMP is organized into two sections (cross-referenced tables), one for mitigation and the second for monitoring. Within that division the impacts, mitigative measures and monitoring actions split into effects or actions likely to occur during the pre-implementation, implementation, and post-implementation periods⁴.

Pre-Implementation and Post-implementation mitigative and monitoring actions will be implemented by MoTC, its Investment Projects Implementation Group (IPIG) and the CSC. During the implementation period, i.e. when the contractor is maintaining the road, most mitigative measures and some of the monitoring tasks will be implemented by the contractor and monitoring functions by the IPIG but carried out by the CSC. Who does what and when has also been defined in the EMP (Table 2).

While IPIG of MoTC will have oversight and management decision responsibility for the project, the CSC will manage the contract and contractor, making sure that the EMP is implemented and will also be completing the mandatory semi-annual monitoring reports.

⁴ In standard infrastructure projects these three divisions are usually pre-construction, construction and operating periods, but since this work involves only routine maintenance a different set of terms was used.

6.3. Mitigation and Monitoring Details

6.3.1. Pre-implementation Period Actions

For the pre-implementation period the EMP lists six environmental issues that if addressed effectively will result in no or far fewer impacts during the implementation period.

6.3.2. Implementation Period Actions

While the actual maintenance tasks such as painting lines on the road or replacing bridge guardrails will generate few negative impacts, it is how the work is carried out by the contractor that could lead to problems. It is for this reason that the implementation section of the EMP focuses on contractor work methods and proper handling and storage of materials and prompt clean up after work has been completed or while unwanted conditions, such as excessive dust have been created. Twenty actions, mostly related to contractor good housekeeping practices are defined in detail. The implementation period mitigative and monitoring also address proper contractor liquid and solid waste management, including storage of materials and surface runoff controls.

Construction materials required by the contractor, such as asphalt, bitumen and aggregate, cement and possibly concrete will all be obtained from existing licensed operators, thus no action will be needed as these sources are operating within the law. Contractors will be required to provide confirmation that materials suppliers are licensed and operating legally.

6.3.3 Post-Implementation Period Actions

The post implementation actions deal with checking that implementation period mitigative and monitoring measures were implemented in a credible and timely manner. This EMP has three such activities, focusing on reporting, checking contractor work clean up and ensuring the improvements to environmental conditions, such as better dust control and roadside vegetation management are carried over into the post-implementation period and are adopted as regular operating functions of the road maintenance units.

Table 2: Environmental Management Plan: Environmental Mitigation Table (EMiT)

N°	Environment Issue	Impact	Mitigative Measures	Time Frame	Location	Implementer	Supervisor
1	PRE-IMPLEMENTATION PERIOD						
1.1	Preservation of Top Soil	Topsoil washed away or blown away	MoTC/IPIG will prepare an earthworks checklist that defines for the contractor, limits to the excavation during the road rehabilitation. Instructions for topsoil management will also be defined, including the removal and storage of all topsoil to be used in landscaping, once the road work is completed. Use of soil from private land will be minimized and only after consultation and recorded agreement with landowners on compensation	During Planning phase, in parallel with the preparation phase of the contractors	At any locations where borrow pits, quarries will be operated.	CSC (since CSC has been appointed at the moment of preparation of this document)	MOTC
1.2	Disturbance to Archaeological and Cultural Sites	Arch. or cult, site damaged	No cultural or archaeological sites have been identified in the area within the road RoW or near the road and thus no mitigation measures are required.	----	---	-----	-----
1.3	Disturbance of environmental sensitive areas, as wetland, old-growth forest or areas protected for biodiversity	ESA's , biodiversity areas damaged	No environmentally sensitive sites have been identified within the 100m-wide RoW of the road (no wetland, no forest, no special biodiversity hotspot) or on either side of the boundary, and thus no mitigation measures are required.	----	---	-----	-----
1.4	Materials Haul Routes use	Vehicle traffic causes pollution and safety issues	Construction vehicles hauling materials along urban roads and anywhere where there are roadside residence will be limited and the MoTC will establish a route plan to minimize this disruption	During contractor mobilization, i.e. before contractor starts work in the field	On all identified haul routes	CSC (since CSC has been appointed at the moment of preparation of this	MOTC

N°	Environment Issue	Impact	Mitigative Measures	Time Frame	Location	Implementer	Supervisor
						document)	
1.5	Consultation Plan with affected roadside landowners	Landowners not aware of upcoming work and block activity	The work will not result in restricted access from a businesses and residences to the road. Therefore no mitigation measures are required. If the issue occurs during implementation it shall be monitored according to laws and regulations of Kyrgyz Republic	Completed prior to contractor mobilization and provided the contractor as part of the contract documentation	Applied to any location where there is likelihood of delays and temporary access restrictions	CSC jointly with IPIG (since CSC has been appointed at the moment of preparation of this document)	IPIG/MOTC
1.6	Contractor's Occupational and Environmental health and Safety Capacity	Worker OHS issues arise during work	Unfortunately contractors have a very poor record complying with workplace and environmental safety regulations. To address this the contract will include the requirement for an H&S Officer and require the contractor to define a Occupational and Environmental Health and Safety standard for all work, including work camp operation, management of cement dust, and use of Personal Safety Equipment.	Standard to be prepared by the Consulting Engineer, IPIG and the contractor prior to start of work. The standard will be based on KR regulations and of they are not available ILO standards	The standards will be applied to all work undertaken by the contractor or any subcontractor	Contractor and CSC	IPIG/MOTC
2	IMPLEMENTATION PERIOD						

N°	Environment Issue	Impact	Mitigative Measures	Time Frame	Location	Implementer	Supervisor
2.1 Dust and Air Quality							
2.1.1	Dust Generation: Transportation of Material: A small increase in particulate matter (dust) is expected at the location of rehabilitation works and from vehicles hauling materials to the rehabilitation areas.	Dust pollution	<p>i. The Contractor will be required to spray water on uncovered sand and gravel layers in dry periods within villages and near houses located close to the road and to cover the trucks used for transport.</p> <p>ii. Dust control at the construction site will be controlled by watering during dry periods and setting strict speed limits of no more than 30kph across the rehabilitation sections.</p>	Throughout the construction period	Anywhere where there is material moved, earthworks cutting and filling.	Contractor and the project's CSC	IPIG and Contract Supervision Consultant
2.1.2	Dust Generation: Quarry and Batching Plant Operation and removal and placement of cut and fill materials respectively	Dust pollution	<p>i. The works do not include large cement and concrete works and shall be carried out without a batching plant. Therefore no mitigation is required.</p> <p>ii. Dust during manual batching for small concrete structure shall be minimized by slow and controlled mixing of the cement with aggregate to produce concrete.</p> <p>iii. dust during material extraction and movement shall be controlled through transport in batched trucks and watering during dry period.</p>	Throughout the construction period	Anywhere where there is material moved, earthworks cutting and filling.	Contractor and the project's CSC	IPIG and Contract Supervision Consultant
2.2	Increase in air pollution from vehicular and machinery exhaust	Air Qual. degradation	<p>Emissions will be minimized by:</p> <p>i. ensuring that the contractor's fleet of vehicles are properly maintained according to manufacturer's specifications;</p>	During Construction	Construction Site	Contractor and the project's CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Impact	Mitigative Measures	Time Frame	Location	Implementer	Supervisor
			<ul style="list-style-type: none"> ii. use of appropriate octane fuel and haul loads within specified limits. iii. Vehicle idling time limits to no more than 10 minutes, iv. Equipment such as the diesel generator will be included in the emission control program and will be and regularly tuned to prevent excessive temporary pollution. 				
2.3	Solid waste management at the construction site	Garbage litter	No open incineration of solid waste (garbage) and construction materials shall be permitted on site. All plastics , paper and useable wood will be recycled. Wood scraps can be burned.	During Construction	Construction Site	Contractor and the project's CSC	IPIG and Contract Supervision Consultant
2.4 Surface and Groundwater Quality							
2.4.1	Contamination of Water Resources (Surface& Groundwater) Surface water can be polluted by entering of bitumen and other chemicals used in rehabilitation works. Groundwater contamination from surface runoff leaking into roadside wells.	Surface water quality degradation	<ul style="list-style-type: none"> i. Fuel and oil storage areas should be at least 500m away from watercourses and repair yards to be equipped with an impervious platform, with interceptor traps so that any fuel leakage is retained within the site. ii. All fuel storage sites must be checked daily for leaks and held in an impervious site where spilled/leaking material can be collected. iii. Wash down water from machinery repair areas to be directed into this system that retains the oil and grease. Refueling not be permitted within or adjacent to watercourses. Surface water channels crossed by the road will be monitored upstream and downstream of the road before, during and after the work has been completed on that crossing. iv. Water channels have to be diverted properly, protection arrangements should be provided at each culvert / water crossing. v. Small concrete works at bridges and 	Throughout the construction period	All construction sites	Contractor and the project's CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Impact	Mitigative Measures	Time Frame	Location	Implementer	Supervisor
			culverts shall be done by mixing in small mixing machine or by hand, by protecting the area of mixing with impermeable cloth, and all remaining unused concrete shall be evacuated to an agreed dump or used on local roads if need is expressed by local residents				
2.4.2	Interruption / Contamination of Water channels: Movement/drain age of surface water interrupted due to improper construction activities, inadequate diversions and notifications.	Surface water quality degradation	<ul style="list-style-type: none"> i. Contractor should provide the adequate sized diversion, so that there shall be no disturbance to water flows of canal /water course. ii. Protection mechanism should be provided to avoid contamination. iii. The land used for the temporary diversion and the water course shall be restored as far as possible to its initial state once the work has been completed 	Construction period	Culverts and bridges	Contractor and the project's CSC	IPIG and Contract Supervision Consultant
2.5 Fauna & Flora							
2.5.1	Loss of Vegetation and trees	Terrestrial habitat loss	The project does not include any requirement for the cutting of mature trees, therefore no mitigative measures are required. If there is unforeseen cutting required, they shall be monitored according to according to the Law of KR "General technical rules and regulations for environmental safety in the Kyrgyz Republic", #151, Clause 12 dtd. 08.05.2009. and the Law of KR "On Protection and Use of Flora", #53 dtd. 20.06.2001.	Design and implementation planning for Kara-balta - Suusamy road	At any locations where mature trees will be cut down.	Contractor and the project's CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Impact	Mitigative Measures	Time Frame	Location	Implementer	Supervisor
2.5.2	Over Used Local natural resources: Project Labor force can impose a burden on, water resource, wildlife, fuel wood, and sanitation system., by using these resources indiscriminately	Excessive use pressure on land resources	Labor for the project will be hired exclusively locally, so there will be no additional impact on natural and social resources and services.	Construction period	Contractor's depots and work areas	Contractor and the project's CSC and EHS officer	IPIG and Contract Supervision Consultant
2.6 Spoil and Solid Waste							
2.6.1	Disposal of demolished asphalt layers and base materials of the existing road	Contamin. from waste	Demolished asphalt may be re-used in the soft shoulders or as fill for other parts of the rehabilitation works. It may also be used as back-fill for borrow pits and then over-lain with top soil. Asphalt can be spread on adjacent roads as surface or pothole fill material and compacted.	During Construction	All Construction Sites	Contractor and the project's CSC	IPIG and Contract Supervision Consultant
2.6.2	Unused construction material (sand, crush), empty drums, concrete waste and waste from work camps.	Contamin. from waste	<ul style="list-style-type: none"> i. The contractor will identify dumping locations for construction debris and non-hazardous solid waste with DEP9/Bishkek-Osh and the Supervision Consultant. If required, will get approval from local authorities, territorial environmental divisions. ii. The contractor shall identify any hazardous waste as part of its health and safety plan and dispose of the material through an approved waste management contractor. 	During Construction	All Construction Sites	Contractor and the project's CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Impact	Mitigative Measures	Time Frame	Location	Implementer	Supervisor
			<ul style="list-style-type: none"> iii. The cost of disposal of hazardous and non-hazardous waste shall be included in the Contractors BOQ. iv. No construction waste disposal or storage area should permit direct drainage of runoff water into the Kara-Balta River, and to that end the drainage water will be directed to either a sump area of grassed surface allowing particulates to fall out before discharge to the river takes place. The Supervision Consultant will review and approve all such drainage works and will require then at any temporary or permanent construction waste disposal sits 				
2.7	Quarry/Borrow Materials						
2.7.1	Preservation of Top Soil	erosion	<ul style="list-style-type: none"> i. Excavation of earth fill will be limited to an appropriate depth of 20cm. ii. Where deep ditching is carried out, the top half meter layer will be stripped and stockpiled. Height of top soil stockpiling should not exceed 90 cm. iii. The ditch will be filled initially with debris/scrap material from old construction and leveled with stockpiled topsoil later. iv. Where borrow pits cannot be fully rehabilitated, land owners will be compensated as provided in agreements between the land owner and contractor. 	During Construction	At any locations where borrow pits, quarries will be operated.	Contractor and the project's CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Impact	Mitigative Measures	Time Frame	Location	Implementer	Supervisor
2.7.2	Overloading of trucks, may damage pavement, bridges, and culverts	Pavement degradation	The Contractor will ensure that loaded trucks do not exceed road, bridge and pavement specifications and are checked by weighbridges. The contractor will be required to monitor the transport of material, recording vehicle movements and weights, to be inspected.	Throughout construction period	Construction sites	Contractor, the project CSC	IPIG and Contract Supervision Consultant
2.7.3	Risk of erosion and destruction of landscape from side borrow operations.	erosion	Side-borrowing along or outside the RoW will not be permitted unless a construction emergency arises, and which will trigger a mandatory consultation with IPIG.			Contractor, CSC	IPIG, CSC
2.8 Noise and Vibration							
2.8.1	Noise and Vibrations associated with earthworks and haul roads.	Noise pollution	<ul style="list-style-type: none"> i. Enforcing a speed limit of 30 kph within 500m of any village. ii. Restricting operating hours through roadside villages and settlements to between hours of 0700 and 1800. iii. Large and noisy machinery operations close to urban areas are restricted to daylight hours, and a schedule agreed to between contractor and local communities. 	During Construction period	Construction areas	Contractor, the CSC and an EHS Inspector	IPIG, Contract Supervision Consultant
2.8.2	Noise and Vibrations associated with compaction of asphalt and unbound materials	Noise pollution	<ul style="list-style-type: none"> i. Application shall be carried out with equipment checked for compliance with the applicable Laws in KR regarding Noise and Vibration at construction sites: SN 2.2.4/2.1.8.562-96 "Noise in working areas, dwelling accommodations, public buildings and on the territory of residential construction". SN 2.2.4/2.1.8.566-96 "Production vibration. Vibration in accommodations, dwelling and public buildings». ii. Restricting operating hours in villages and settlements to between hours of 0700 and 	During the Construction Period	All construction sites in villages or within 100m of a settlement	Contractor and the project's CSC	IPIG, Contract Supervision Consultant

N°	Environment Issue	Impact	Mitigative Measures	Time Frame	Location	Implementer	Supervisor
			1800.				
2.9 Health and Safety							
2.9.1	Damage / disturbance to Utilities within RoW	Damage to utilities	There is no relocation of utilities required under the contract, therefore there is no monitoring of eventual disruptions.	----	---	-----	-----
2.9.2	Traffic Disturbance : Loss of access for roadside residents	Noise pollution	Contractor shall provide safe and convenient passage for vehicles and pedestrians to and from side roads and properties connecting the project road/area. In case such work occurs, traffic management arrangement shall be submitted for approval by the Supervision Engineer , after consultation with local people and the traffic police, before the work takes place, and according to local regulations.	Construction Period	Town Crossings	Contractor .CSC and EHS Inspector	IPIG, Contract Supervision Consultant
2.9.3	Health and Safety Concerns: Protecting the workforce and maintaining a safe working environment.	OHS compromise -ed	<ul style="list-style-type: none"> i. Contractor must provide safety vests, hard hats and protective footwear for all workers handling heavy machinery, and working with hazardous materials such as concrete, asphalt, paints, and cleaning agents . ii. Contractor must provide protective masks to machine operators, where dust can be generated, and to anyone working in the area of the machines, with masks of a micron size, capable of capturing dust down to 2 microns. iii. Any works at night should be adequately lit and high visibility clothing worn and contractor should provide basic training on use of protective clothing and equipment. 	Construction period	Contractor's Depots and work areas	Contractor .CSC and EHS Officer	IPIG, Contract Supervision Consultant
2.9.4	Contractor's work areas and depots not	Contaminati of surface and	<ul style="list-style-type: none"> i. All depots shall be provided with septic sanitation facilities and potable water. ii. Monitoring will be required for the solid waste 	Throughout the construction period	Contractor's Depots and work areas	Contractor CSC and EHS	IPIG, Contract Supervision

N°	Environment Issue	Impact	Mitigative Measures	Time Frame	Location	Implementer	Supervisor
	maintained, no proper waste management, environmental health and safety measures.	groundwater r from contaminate work area runoff.	disposal at the depot and to ensure that the health and safety plan based on contract specifications is followed. iii. During operation, the surface of the depot used for storage of construction materials shall be protected against run-off and spills of hazardous materials using impermeable protection covering the ground and a system to collect contaminated run-off.			Inspector	Consultant
2.10	Lack of contractor's construction period mitigation completion report	Implementation measures not addressed	Contractor will be required to prepare and safeguards implementation at the end of the construction period, discussing very briefly, each construction period EMP item.	Prior to final payment to contractor	NA	Contractor and the project's CSC	IPIG, Contract Supervision Consultant
3	POST-IMPLEMENTATION PERIOD (Default Yr. 1)						
3.1	Failure to confirm submission of report defined in 2.10 above	No record of mitigative measures implementation	The contractor will provide an mitigation and monitoring completion report listing all actions taken in compliance with this EMP items defined and with any other safeguard requirement specified in the contract and submit that to IPIG before the final payment can be released. IPIG will review and approve this report	1 month before the end of the contract period	NA	Contractor and CSC	IPIG/ MoTC
3.2	Environmental Quality Degraded	Stop implementin good environmental practices	Maintenance contractor or DEP9 will endeavour to keep road dust and snow free and speed limit signs will be maintained. Traffic Police will improve enforcement of limits and conduct spot checks.	Post-Implementation period	All villages & towns (Karabalta and Sosnovka)	Contractor for maintenance and Traffic Police for traffic regulation	IPIG/ MoTC
3.3	Better Roads	Accidents	Appropriate traffic calming and signage will be	Post-	As per	Contractor	IPIG/ MoTC

N°	Environment Issue	Impact	Mitigative Measures	Time Frame	Location	Implementer	Supervisor
	and speeding	and safety issues	installed for the driver, speed limits shall be monitored by the traffic police to avoid any accident and subsequent spillage. An emergency service may be provided by the local authorities.	Implementation period	design	and Traffic police	

Note: The three work periods have been labeled as PRE-Implementation, Implementation and POST-Implementation since the work involves road maintenance over a three year implementation period after which the work will continue as standard operating procedures. There is no specific project, rather a large number of repair activities such as bridge rail painting, pothole repairs, road shoulder clearing, culvert repair, etc.

Table 3: Environmental Management Plan-Environmental Monitoring Table (EMoT)

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
1	Pre-Implementation Period Impacts						
1.1	Preservation of Top Soil	MoTC/IPIG will prepare an earthworks checklist that defines for the contractor, limits to the excavation during the road rehabilitation. Instructions for topsoil management will also be defined, including the removal and storage of all topsoil to be used in landscaping, once the road work is completed. Use of soil from private land will be minimized and only after consultation and recorded agreement with landowners on compensation	Monitor checks that topsoil management steps prepared and ready for implementation	During Planning phase, in parallel with the preparation of bid documents	Copy of topsoil protection actions	CSC	IPIG/MOTC
1.2	Disturbance to Archaeological and Cultural Sites	No cultural or archaeological sites have been identified in the area within the road RoW or near the road and thus no mitigation measures are required.	----	----	---	-----	-----
1.3	Disturbance of environmental sensitive areas, as wetland, old-growth forest or areas protected for biodiversity	No environmentally sensitive sites have been identified within the 100m –wide RoW of the road (no wetland, no forest, no special biodiversity hotspot) or on either side of the boundary, and thus no mitigation measures are required.	----	----	---	-----	-----

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
1.4	Materials Haul Routes	Construction vehicles hauling materials along urban roads and anywhere where there are roadside residence will be limited and the MoTC will establish a route plan to minimize this disruption	Route plan confirmed by IPIG-planners and recorded for use in audit report	Prior to contractor mobilization	Written and dated note indicating compliance & inspection	CSC	IPIG/MOTC
1.5	Consultation Plan with affected roadside landowners	Contractors will be required to avoid access restrictions for roadside residences and businesses, as much as possible. In order to manage this problems, MoTC, working with the contractor ,will establish a protocol for maintaining traffic and access for local residents during construction along any road section, including providing temporary crossing means when shoulders and draining ditches are being repaired or deepened, when asphalt layers are being removed or replaced or when erosion control measures are being built/repared	----	----	---	-----	-----
1.6	Contractor's Occupational and Environmental health and Safety Capacity	Unfortunately contractors have a very poor record complying with workplace and environmental safety regulations. To address this the contract will include the requirement for an H&S Officer and require the contractor to define a Occupational and Environmental Health and Safety standard for all work, including work camp operation, management of cement dust, and use of Personal Safety	Review Construction contracts and specifications- to check content for OHS plan content.	Plan to be provided to the Supervision Engineer and IPIG prior to start of work	Written and dated note indicating compliance	CSC	MOTC

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
		Equipment.					
2	IMPLEMENTATION PERIOD						
2.1 Dust and Air Quality							
2.1.1	Dust Generation: Transportation of Material: A small increase in particulate matter (dust) is expected at the location of rehabilitation works and from vehicles hauling materials to the rehabilitation areas.	i. The Contractor will be required to spray water on uncovered sand and gravel layers in dry periods within villages and near houses located close to the road and to cover the trucks used for transport. ii. Dust control at the construction site will be controlled by watering during dry periods and setting strict speed limits of no more than 30kph across the rehabilitation sections.	Travel work areas and check for dust—and if found take immediate action with contractor	Anywhere where there is material moved, earthworks cutting and filling.	Written and dated note indicating compliance or issue and action taken	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
2.1.2	Dust Generation: Quarry and Batching Plant Operation and removal and placement of cut and fill materials respectively	<p>i. The works do not include large cement and concrete works and shall be carried out without a batching plant. Therefore no mitigation is required.</p> <p>ii. Dust during manual batching for small concrete structure shall be minimized by slow and controlled mixing of the cement with aggregate to produce concrete.</p> <p>iii. dust during material extraction and movement shall be controlled through transport in batched trucks and watering during dry period.</p>	Travel Quarry and Works site and check for dust—and if found take immediate action with contractor.	Anywhere where Quarry and works are operated.	Written and dated note indicating compliance or issue and action taken	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant
2.2	Increase in air pollution from vehicular and machinery exhaust	<p>Emissions will be minimized by:</p> <p>v. ensuring that the contractor's fleet of vehicles are properly maintained according to manufacturer's specifications;</p> <p>vi. use of appropriate octane fuel and haul loads within specified limits.</p> <p>vii. Vehicle idling time limits to no more than 10 minutes,</p> <p>viii. Equipment such as the diesel generator will be included in the emission control program and will be and regularly tuned to prevent excessive temporary pollution.</p>	Record findings and conduct regular inspections in association with construction supervision	During Construction period	Inspection Note to file for use in contractor's reporting and in audit reports.	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
2.3	Solid waste management at the construction site	No open incineration of solid waste (garbage) and construction materials shall be permitted on site. All plastics , paper and useable wood will be recycled. Wood scraps can be burned.	Record findings and conduct regular inspections in association with construction supervision	During Construction period	Inspection Note to file for use in contractor's reporting and in audit reports.	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant
2.4 Surface and Groundwater Quality							
2.4.1	Contamination of Water Resources (Surface& Groundwater) -- Surface water can be polluted by entering of bitumen and other chemicals used in rehabilitation works. Groundwater contamination from surface runoff leaking into roadside wells.	<ul style="list-style-type: none"> i. Fuel and oil storage areas should be at least 500m away from watercourses and repair yards to be equipped with an impervious platform, with interceptor traps so that any fuel leakage is retained within the site. ii. All fuel storage sites must be checked daily for leaks and held in an impervious site where spilled/leaking material can be collected. iii. Wash down water from machinery repair areas to be directed into this system that retains the oil and grease. Refueling not be permitted within or adjacent to watercourses. Surface water channels crossed by the road will be monitored upstream and downstream of the road before, during and after the work has been completed on that crossing. iv. Water channels have to be 	Regular inspection of work camps, contractors yard, fueling areas , fuel storage	At least monthly throughout the construction period.	Checklist showing the check of fuel and lubricant handling, waste oil management, machinery was down water control, etc. signed and dated--filed. Checklist showing the check for lighting and signage signed and date filled .	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
		<p>diverted properly, protection arrangements should be provided at each culvert / water crossing.</p> <p>v. Small concrete works at bridges and culverts shall be done by mixing in small mixing machine or by hand, by protecting the area of mixing with impermeable cloth, and all remaining unused concrete shall be evacuated to an agreed dump or used on local roads if need is expressed by local residents</p>					
2.4.2	<p>Interruption / Contamination of Water channels: Movement/drainage of surface water interrupted due to improper construction activities, inadequate diversions and notifications.</p>	<p>iv. Contractor should provide the adequate sized diversion, so that there shall be no disturbance to water flows of canal /water course.</p> <p>v. Protection mechanism should be provided to avoid contamination.</p> <p>vi. The land used for the temporary diversion and the water course shall be restored as far as possible to its initial state once the work has been completed</p>	<p>Inspection of diversion along the road, check signage, lighting any leakage etc at the diversions and rectify through contractor. Ensure contractor has adequately restored temporary work areas.</p>	Construction period	Contractor EHS Officer	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant
2.5 Fauna & Flora							

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
2.5.1	Loss of Vegetation and trees	The project does not include any requirement for the cutting of mature trees, therefore no mitigative measures are required. If there is unforeseen cutting required, this shall be monitored according to the following the Law of KR "General technical rules and regulations for environmental safety in the Kyrgyz Republic", #151, Clause 12 dtd. 08.05.2009. and the Law of KR "On Protection and Use of Flora", #53 dtd. 20.06.2001.	----	----	---	----	----
2.5.2	Over Used Local natural resources: Project Labor force can impose a burden on, water resource, wildlife, fuel wood, and sanitation system., by using these resources indiscriminately	Labor for the project will be hired exclusively locally, so there will be no additional impact on natural and social resources and services.	Inspection of work areas and meet with local officials to establish if excessive use of local resources is a concern	Throughout construction period—at least once when work is near or in a community	Meeting note signed and dated	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant
2.6 Spoil and Solid Waste							
2.6.1	Disposal of demolished asphalt layers and base materials of the existing road	Demolished asphalt may be re-used in the soft shoulders or as fill for other parts of the rehabilitation works. It may also be used as back-fill for borrow pits and then over-lain with top soil. Asphalt can be spread on adjacent roads as surface or pothole fill material and	Monitor to check waste handling and disposal procedure of contractor	Throughout construction period	Note to file, signed and dated	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
		compacted.					
2.6.2	Unused construction material (sand, crush), empty drums, concrete waste and waste from work camps.	<p>i. The contractor will identify dumping locations for construction debris and non-hazardous solid waste with DEP9/Bishkek-Osh and the Supervision Consultant</p> <p>ii. The contractor shall identify any hazardous waste as part of its health and safety plan and dispose of the material through an approved waste management contractor.</p> <p>iii. The cost of disposal of hazardous and non-hazardous waste shall be included in the Contractors BOQ.</p> <p>iv. No construction waste disposal or storage area should permit direct drainage of runoff water into the Kara-Balta River, and to that end the drainage water will be directed to either a sump area of grassed surface allowing particulates to fall out before discharge to the river takes place. The Supervision Consultant will review and approve all such drainage works and will require then at any temporary or permanent</p>	<p>Monitor to check waste handling and disposal procedure of contractor</p> <p>Supervising Consultant to inspect and approve drainage provisions provided for all temporary and permanent construction waste disposal areas</p>	Throughout construction period	Note to file, signed and dated	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
		construction waste disposal sites					
2.7 Quarry/Borrow Materials							
2.7.1	Preservation of Top Soil	<ul style="list-style-type: none"> i. Excavation of earth fill will be limited to an appropriate depth of 20cm. ii. Where deep ditching is carried out, the top half meter layer will be stripped and stockpiled. The height of top soil stockpiling should not exceed 90 cm. iii. The ditch will be filled initially with debris/scrap material from old construction and leveled with stockpiled topsoil later. iv. Where borrow pits cannot be fully rehabilitated, land owners will be compensated as provided in agreements between the land owner and contractor. 	i. Check query sites for depth.	During Construction period	Written and dated note indicating compliance or issue and action taken.	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant
2.7.2	Overloading of trucks, may damage pavement, bridges, and culverts	The Contractor will ensure that loaded trucks do not exceed road, bridge and pavement specifications and are checked by weighbridges. The contractor will be required to monitor the transport of material, recording vehicle movements and weights, to be inspected.	Examine weighbridge records and compare to amount of material moved	Throughout construction period	Inspection Notewith findings, dated and signed	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
2.7.3	Risk of erosion and destruction of landscape from side borrow operations.	Side- borrowing along or outside the RoW will not be permitted unless a construction emergency arises, and which will trigger a mandatory consultation with IPIG.	Inspect all side borrow activities and establish what permission given, and if none require immediate closure and restoration of the site.				
2.8 Noise and Vibration							
2.8.1	Noise and Vibrations associated with earthworks and haul roads.	<ul style="list-style-type: none"> iv. Enforcing a speed limit of 30 kph within 500m of any village. v. Restricting operating hours through roadside villages and settlements to between hours of 0700 and 1800. vi. Large and noisy machinery operations close to urban areas are restricted to daylight hours, and a schedule agreed to between contractor and local communities. 	Using a portable noise meter, monitor works conditions , and inspect if work conducted within permitted time period in urban zones	During Construction period	Inspection Note to file for use in contractor's reporting with eventual noise measurements.	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant
2.8.2	Noise and Vibrations associated with Compaction of asphalt and unbound materials	<ul style="list-style-type: none"> i. Application shall be carried out with equipment checked for compliance with the Laws of KR regarding noise and vibration on construction sites, as well as the standards defined in this EMP: SN 2.2.4/2.1.8.562-96 "Noise in working areas, dwelling accommodations, public buildings and on the territory of residential construction". SN 2.2.4/21.8.566-96 "Production vibration. Vibration in accommodations, dwelling and public buildings». i. Restricting operating hours in 	Using a portable noise meter, monitor works conditions , and inspect if work conducted within permitted time period in urban zones	During Construction period	Monitoring dataset presented in a tabular format	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
		villages and settlements to between hours of 0700 and 1800.					
2.9 Health and Safety							
2.9.1	Damage / disturbance to Utilities within RoW	There is no relocation of utilities required under the contract, therefore there is no monitoring of eventual disruptions.	----	----	---	-----	-----
2.9.2	Traffic Disturbance : Loss of access for roadside residents	Contractor shall provide safe and convenient passage for vehicles and pedestrians to and from side roads and properties connecting the project road/area. In case such work occurs, traffic management arrangement shall be submitted for approval by the Supervision Engineer , after consultation with local people and the traffic police, before the work takes place, and according to local traffic regulations.	i. Inspect construction areas where access is an issue and establish if contractor is managing problem and if local residents are satisfied. ii. Always identify by clear signage according to regulation maintenance activities on the roadway	Throughout construction period	Inspection note with findings, dated and signed	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
2.9.3	Health and Safety Concerns: Protecting the workforce and maintaining a safe working environment.	<ul style="list-style-type: none"> i. Contractor must provide safety vests, hard hats and protective footwear for all workers handling heavy machinery, and working with hazardous materials such as concrete, asphalt, paints, and cleaning agents. ii. Contractor must provide protective masks to machine operators, where dust can be generated, and to anyone working in the area of the machines, with masks of a micron size, capable of capturing dust down to 2 microns. iii. Any works at night should be adequately lit and high visibility clothing worn and contractor should provide basic training on use of protective clothing and equipment. 	Inspection of construction sites to ensure proper use of OHS gear and contractor enforcement	Throughout construction period	Inspection note with findings, dated and signed	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant
2.9.4	Contractor's work areas and depots not maintained, no proper waste management, environmental health and safety measures.	<ul style="list-style-type: none"> i. All depots shall be provided with septic sanitation facilities and potable water. ii. Monitoring will be required for the solid waste disposal at the depot and to ensure that the health and safety plan based on contract specifications is followed. iii. During operation, the surface of the depot used for storage of 	Inspect all operations in the depots including worker housing and all waste management procedures.	Throughout the construction period	Inspection note re findings, dated and signed.	Contractor under supervision of CSC	IPIG and Contract Supervision Consultant

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
		construction materials shall be protected against run-off and spills of hazardous materials using impermeable protection covering the ground and a system to collect contaminated run-off.					
2.10	Lack of contractor's construction period mitigation completion report	Contractor will be required to prepare a safeguards implementation report at the end of the construction period, discussing very briefly, each construction period EMP item, how and when it was implemented and any outcome.	Collect and review report for content and completeness	Within 1 month of end of construction period	Checklist indicating that report acceptable and compliant	Contractor with assistance from CSC	IPIG and Contract Supervision Consultant
3	Post-Implementation Period (Default year 1)						
3.1	Failure to confirm submission of report defined in 2.10 above	The contractor will provide an mitigation and monitoring completion report listing all actions taken in compliance with this EMP items defined and with any other safeguard requirement specified in the contract and submit that to IPIG before the final payment can be released. IPIG will review and approve this report	Obtain completion report and review for compliance.	1 month before the end of the contract period	Note to file and copy of the completion report	Contractor with assistance from CSC	MoTC
3.2	Environmental Quality improved	The future maintenance contractor or DEP9 will endeavor to keep road dust and snow free and speed limit signs will be maintained. Traffic Police will improve enforcement of limits and conduct spot checks.	MoTC to take necessary action.	Post-Implementation period	Note-to file to indicate status of the maintenance works	Contractor, MoTC, maintenance contractor, and Traffic police	MoTC

N°	Environment Issue	Mitigation measures	Monitoring Action	Timing	Monitoring Deliverable	Implemented by	Supervised by
3.3	Risk of Accident and Injury reduced	Appropriate traffic calming and signage will be installed for the driver, speed limits shall be monitored by the traffic police to avoid any accident and subsequent spillage. An emergency service may be provided by the local authorities.	MoTC to take necessary action.	Post-Implementation period	Note to file to indicate status of the maintenance works	Contractor, MoTC, maintenance contractor, and Traffic police	MoTC

Note: The three work periods have been labeled as PRE-Implementation, Implementation and POST-Implementation since the work involves road maintenance over a three year implementation period after which the work will continue as standard operating procedures. There is no specific project, rather a large number of repair activities such as bridge rail painting, pothole repairs, road shoulder clearing, culvert repair, etc.

7.0 EMP Implementation Cost

Undertaking the environmental safeguard steps as defined in the “implementation” section of the EMP should be “business as usual” activities. In other words, environmentally aware contractors take these precautions as a matter of course, especially as this work is dealing with routine maintenance activities.

That being said, the 21 actions required of the contractor will take additional time and therefore the following estimate is provided.

Table 4: EMP Implementation Cost Estimate (Person Days)

Period & Participants	Total No. of Months	General Implementation Days/ month	Report Preparation or Review (days/month)	Total for Period (days)
Pre Implementation	6			
Contractor		variable	variable	5-7
CSC		3	1	30
IPIG		0.5	0.5	9
Implementation	36			
Contractor		4	1	180
			Semi Annual report Prep/Review; Days/year	
CSC		2	10	102
IPIG		0	4	12
Post-Implementation	4-5			
Contractor		0	NA	5-7
CSC		One time 4 days	One time 7 days	11
IPIG		1	1	10
Grand Total	Total Environmental Safeguard Days			
Contractor	194-200			
CSC	143			
IPIG	31			

Depending on the performance of the contractor, level of reporting required due to non-compliance, and need for additional inspections, the estimate may increase by as much as 15%. This 15% will be for CSC’s use, since the contractor will provide the complete estimate for the implementation of all actions. The only exception would be if unanticipated impacts occurred, such as a major landslide into the Kara-Balta River, requiring the application of additional environmental safeguard measures.

Secondly the expenses associated with these person-days, such as travel, per diem and communication have not been included.