Initial Environmental Examination

Project No.: 50063
31 August 2016

(Draft) – Main Report

UZB: Kashkadarya Regional Road Project

Prepared by the Republican Road Fund for the Asian Development Bank.

O`ZBEKISTON RESPUBLIKASI
MOLIYA VAZIRLIGI
HUZURIDAGI
RESPUBLIKA YO`L JAMG'ARMASI

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Ms. XiaohongYang
Director
Transport and Communications Division
Central and West Asia Department

Subject: **Project - Reconstruction of the 77 km on the route Karshi-Shakhrisabz-Kitob. Initial Environmental Examination (IEE)**

Dear Ms. Yang,

The Republican Road Fund has no objection to disclose the IEE prepared by the Consultant (Sheladia Associates, Inc.) in the website of ADB.

Sincerely,

Deputy Director
Republican Road Fund **Murodbek Allabergenov**

100017, Toshkent sh., Istiqlol, 29
Tel.: (998 71) 239-11-12, 239-14-79
Faks: (998 71) 239-14-69

100017, г. Ташкент, Истиклол, 29
Тел.: (998 71) 239-11-12, 239-14-79
Факс: (998 71) 239-14-69

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Abbreviations and Acronyms

ADB	Asian Development Bank
Khokimyat	Town Mayor Office
Ba	Barium
BAP	Borrow Pit Action Plan
CAREC	Central Asia Regional Economic Cooperation Program
CA	Calcium
CL	Center Line (of carriageway)
CO	Carbon monoxide
CO2	Carbon Dioxide
Cr	Chromium
dBA	decibel
EA	Executing Agency
EARF	Environmental Assessment and Review Framework
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EO	Environment Officer
ERP	Emergency Response Plan
ES	Executive Summary
FAO	Food and Agriculture Organization
FE	Iron
FS	Feasibility Study
GoU	Government of Uzbekistan
GLOF	Glacial Lake Outburst Floods
GOST	Technical Standard
Goskompriroda	State Committee for Nature Protection
Goskomgeodezkadastr	State Committee for Land Resources, Surveys, Cartography and the State Cadastre
Goskomgeologia	State Committee for Geology and Mineral Resources
Glavgosekoexpertiza	Goskompriroda SEE Department
GRC	Grievance Redress Committees
GRM	Grievance Redress Mechanism
Ha	Hectare
HC	Hydrocarbons
HSP	Health and Safety Plan
IBA	Important Bird Area
IFI	International Financing Institution
IEE	Initial Environmental Examination
IUCN	International Union for the Conservation of Nature
Km	Kilometer
Km^2	Square kilometer
LARP	Land Acquisition and Resettlement Plan
M	Meter
M^2	Square meter
M^3	Cubic Meter
MAC	Maximum Allowable Concentrations

MAWAR	Ministry of Agriculture and Water Resources
MPE	Maximum Permissible Emission
MPD	Maximum Permissible Discharges
MFF	Multi-tranche Financing Facility
MHRUz	Ministry of Health
MVD	Ministry of Internal Affairs
NGO	Non-Governmental Organization
NH_4+	Ammonium
NOx	Nitrogen oxides
NO_3	Nitrate
Ni	Nickel
Oblast	Province
OM	Operational Manual (of ADB)
OVOS	Uzbek EIA
PAH	Polycyclic aromatic hydrocarbons
Pb	Lead
PC	Public Consultation
PCR	Physical and Cultural Resources
PM	Particulate matter
PO_4	Phosphate
PMU	Project Managing Unit
PPE	Personal Protective Clothing
PPTA	Project Preparatory Technical Assistance (Concept Paper)
PZVOS	Draft Statement on Environmental Impacts
Rayon	District
RoW	Right of Way
RRF	Republican Road Fund
SanPiN	Sanitary Regulations and Standards
Sanoatgeokontekhnazorat	State Inspectorate for Exploration Supervision, Operations Safety Supervision of Industry, Mining and Utilities Sector
SEE	State Environmental Expertise
SNiP	Construction Standards
STD	Sexually transmitted diseases (such as HIV/AIDS)
SSEMP	Site Specific Management Plan
SO2	Sulphur Dioxide
TOR	Terms of Reference
TDI	Tashkent Design Institute
TSP	Total Suspended Particulates
USAID	United States Agency for International Development
USD	United States Dollar
Uzhydromet	Centre of Hydro-meteorological Service
VPD	Vehicles per Day
WB	World Bank
WHO	World Health Organization
WMP	Waste Management Plan
ZEP	Statement on Environmental Consequences
ZVOS	Environmental Assessment
°C	Degrees Celsius

$\mu g/m^3$	Micrograms per cubic meter

Currency Exchange Rates as of 31 May 2016:
1 US$ = 2924.63 UZS (Uzbekistan Som)
($ refers in this report to US-Dollars)

Executive Summary

1. Introduction

1. This initial environmental examination (IEE) is part of the process of compliance with the ADB guidelines in relation to the Kashkadarya Regional Road Project, or the "Project".

2. The IEE provides a road map to the environmental measures needed to prevent and/or mitigate negative environmental effects associated with the development project. The IEE provides a detailed description of the direct and indirect environmental effects associated with the proposed subproject during key periods of work. The IEE:

(i) Describes the extent, duration and severity of the impacts;
(ii) Analyzes all potential impacts, both positive and negative;
(iii) Formulates the mitigation actions and presents it all in the form of an Environmental Management Plan (EMP).

3. Based on the existing ADB Environmental Safeguards Policy (2009), this Project falls under ADB's project **Category B**.

2. Description of the Project

4. The existing road comprises four portions of roadway forming a corridor linking the city of Karshi with Kitab via Shahrizabz (see **Figure ES-1**). The Project involves the rehabilitation of 127 km of the roadway in four sub-sections, two of which will be funded by the ADB under this specific project (77 km ADB funded), and the remaining two funded by the GoU (50 km). The project will be confined within the existing right-of-way with no significant changes in alignment except where the standards require it, e.g. road curvatures. The four sub-sections are funded by the ADB and the GoU as follows:

Table ES.1: Kashkadarya Regional Road Sections

Sub-Section	Length (km)	Road Name	IEE Road Chainage	Funding Entity
1	28	4R79	0-28	GoU
2	**48**	**4R79 (36km)** **4K319 (12km)**	**28-76**	**ADB**
3	22	4K319 (6km) 4R84 (5km) M39 (11km)	76-98	GoU
4	**29**	**M39 (29km)**	**98-127**	**ADB**

5. The IEE herewith focuses predominantly on the two sub-sections funded by the ADB. Separate environmental assessments have been prepared by the Tashkent Design Institute (TDI) for the GoU funded portions of the Project. As such, this IEE will also consider these sections of the road as 'associated facilities' and thereby summarize the potential impacts of these portions of the road as far as is practical given the advance state of works in these sections.

Figure ES.1: Project Location[1]

6. Basic elements of the road design include:

(i) The reconstruction of the road will follow the existing road alignment and keep within the right of way.
(ii) The road will have a carriageway width between 15 and 22.5 meters (depending upon location) with two shoulders between 1.25 and 3 meters.
(iii) Design speeds of 120 km/h will be adopted for flat and undulated terrain and 70 km/h for urban areas.
(iv) Bridges and culverts will be reconstructed or rehabilitated.

[1] http://www.un.org/Depts/Cartographic/map/profile/uzbekist.pdf

(v) Traffic safety features such as lighting, pedestrian crossings, road signs, road marking will also be incorporated.

3. Existing Conditions

7. For most of its extent the Project Corridor traverses the flat, fairly bland agricultural landscape of the 'Karshi steppe'. The road meanders through small villages and towns as it gradually rises towards the end of Project in the foothills of the Zarafshan range which bisects Kashkadarya and Samarkand. There are no protected areas within the immediate vicinity of the Project Corridor and no special status flora or fauna.

8. Instrumental air quality monitoring was undertaken in June, 2016 at three locations, Chim, Esat and Shahrizabz. All of the parameters tested were within limits set by GoU and IFC standards for Dust, NO_X and SO_X.

9. The road crosses two rivers, including the regionally important Kashkadarya river, and numerous collectors (drainage channels) and irrigation channels. Water and gas pipelines can often be seen within the right of way as well as low voltage transmission lines. Water quality tests were undertaken in the Kashkadarya river in June, 2016. The results of the tests indicate that the parameters tested were within the limits set by GoU standards.

10. No sites of archeological or historical significance were observed within the ADB portions of the Project road, however, several cemeteries were noted within the right of way.

11. The main socio-economic activity in the Project corridor is agriculture which the Project is anticipated to benefit by improving access to and from farms and to markets.

12. Several sensitive noise receptors have been identified within the Project corridor including schools, clinics and hospitals. Noise monitoring was undertaken in June 2016 at three locations, Chim, Esat and Shahrizabz. The current noise levels in these areas are within day-time and night-time limits set by GoU and IFC standards.

13. Numerous schools were noted within close proximity of the road. There was a noticeable lack of safety measures around the school locations apart from road signs indicating their presence.

4. Alternatives

14. Several alternatives have been assessed as part of the EIA, including:

(i) "No Project" Alternative - This alternative has been ruled out on the basis that good road connectivity is the key to economic development and reduction of poverty. A "No-Project" alternative would therefore be regarded as counter-productive to such goals.

(ii) Alternative Transport Modes - A rail line exists between Karshi, and Samarkand which has recently been upgraded and electrified as part of an ADB project. The railway is considered necessary as part of a mix of transport modes, with rail promoted as the preferred mode for longer distance, containerized and bulk commodities, as this represents the most environmental and efficient mode of transport. On the other hand, the Project road is promoted for the local and

regional movement of people and goods. Accordingly, the railway is not considered an alternative to the Project but as an additional component of the country wide transport network.

(iii) Alternative Alignments – All rehabilitation works will take place within the RoW, as such no alternative alignments, other than minor alignment changes within the RoW have been proposed for the Project.

(iv) Alternative Route - An alternative road from Samarkand to Karshi exists (A378) and runs parallel to the north of the Project road (approximately 30-40km to the north). The A378 provides and alternative option for any traffic moving between these two cities. However, the A378 does not represent an alternative to traffic wishing to travel to Kitab, Shahrizabz, or any other town or village within the Project corridor. The aim of the Karshi – Shahrizabz - Kitab Project is not simply to stimulate the movement of goods and people between Samarkand and Karshi, and thereby Tashkent and the west and north of the country, its aim is also to stimulate the economy within Kashkadarya and improve transport links within the project corridor. If this aim is to be achieved then the only practical option is the development of the proposed Karshi – Shahrizabz - Kitab road project and no other alternative road corridors need to be assessed.

5. Impact Identification

15. In general, the ecological conditions along the alignment give little reason for concerns of becoming potentially damaged by the foreseen Project activities. The terrain adjacent to the road alignment comprises relatively flat agricultural land, urban settlements and rolling pastureland for its last few kilometers. Items of significant archaeological and historical importance do not appear within the RoW (with the exception of a couple of cemeteries). Accordingly, the IEE established that there were no significant environmental issues that could not be either prevented or adequately mitigated to levels acceptable Uzbek and international standards.

16. The following provides a summary of the potential impacts associated with the Karshi – Shahrizabz - Kitab Road:

Design / Pre-construction Phase

(i) Air Quality – lack of foresight in the siting of construction camps, rock crushing plants, concrete batching plants and borrow pits in the pre-construction phase could lead to significant air quality impacts in the construction phase.

(ii) Flora – inadequate assessment could lead to an excessive amount of trees being cut and the wrong species of trees being re-planted in the wrong locations.

(iii) Health safety – Failure to incorporate a full range of safety measures into the road design may result in accidents and even deaths on the road, especially close to schools.

Construction Phase

(i) Air Quality - During construction of the road, air quality is likely to be degraded by a range of operational activities including; exhaust emissions from the operation of construction machinery; open burning of waste materials; and dust generated from quarries, borrow pits, haul roads, unpaved roads, exposed soils, material stock-piles, etc.

(ii) Soils - Potential soil contamination is a possibility in the construction phase resulting from poorly managed fuels, oils and other hazardous liquids used during the project works. It is also possible, that without adequate protection measures soil erosion could occur on road and bridge embankments.

(iii) Surface and groundwater – Impacts to surface water and groundwater could occur through improper siting, design and operation of construction camps. Poor construction management around bridges and close to surface watercourses could also lead to pollution incidents. Concrete batching plants also have the potential to cause water pollution, such as elevated levels of pH and increased turbidity of water.

(iv) Flora - The most significant impact to flora will be the cutting of more than 48,000 trees as part of the Project, however, none of the trees are considered special status, and they do not provide habitat for any special status fauna.

(v) Fauna - An Important Bird Area (IBA) has been identified approximately 3.2 km north of the Project road. This habitat is unlikely to be impacted directly by Project activities during both the construction and operational phases of the Project.

(vi) Utilities - Medium and low voltage power lines, water supply and gas pipes are located within the Project corridor. It is possible that these utilities will need to be temporarily removed during construction.

(vii) Waste - Road construction will inevitably generate solid and liquid waste products including inert waste (e.g. concrete, wood, plastics, etc.) and hazardous waste (e.g. waste oils, batteries, etc.). In addition, uncontrolled discharges of sewage and 'grey water' (e.g. from washrooms and canteens) from construction sites and worker's camps may also cause odors and pollute local water resources.

(viii) Community Health and Safety - Construction of the road may result in an increase in the total number of road traffic accidents between vehicles, pedestrians and vehicles (especially around schools) and livestock and vehicles.

(ix) Physical and Cultural Resources - Several cemeteries are located close to the road, however, only two (at km 54 and km 59.6) are within the RoW. Given the rich cultural heritage of this region of Uzbekistan it is possible that unexpected discoveries of physical and cultural resources could occur in the construction process.

(x) Noise - The road passes through several settlements. Road construction works may lead to elevated above Uzbek noise standards in these areas during working hours. In addition significant noise impacts may result from long-term exposure to noise from static construction facilities such as rock crushing plants and quarries where operational activities may last for the entire construction period.

Operational Phase

(i) Climate Change - Even though traffic will increase on the Project road, vehicle emissions are unlikely to contribute in a significant way to regional or global greenhouse gas levels. However, climate change could impact upon the Project due to a change in temperature and a change in precipitation levels.

(ii) Hydrology – Run-off from bridge decks could pollute the waterways beneath them.

(iii) Noise - Noise levels are currently below the GOU noise standards within the Project corridor. However, they may potentially increase above the standards

during the operational phase of the Project. This could impact negatively on the health of people living and working in this area.

(iv) Air Quality – Increased traffic volumes could result in increased levels of air emissions, including dust. This could lead to health impacts to the people living and working within the proximity of the road.

(v) Health and safety – Increases in traffic volumes may result in increased levels of accidents on the road.

Cumulative Impacts

17. The main cumulative impacts relate to increased traffic. Traffic levels on ADB portions of the road will not increase without the completion of the other road sub-sections. The main impacts resulting from the increased traffic will be an increase in noise levels during the operational period of the Project. Air quality may be compromised slightly in the form of vehicular emissions. Increased traffic in urban area may lead to an increase in accidents between vehicles and pedestrians, however, the safety measures proposed for the project should help to limit such impacts.

Compliance Impacts

18. In addition to the impacts associated with the construction and operation phases of the project several compliance impacts have also been identified including a lack of environmental clauses in contracts and a lack of construction compliance inspection and environmental training (e.g: if there is no one knowledgeable to undertake compliance monitoring, inspection and regular reporting, little of the EMP will be implemented or completed).

Impacts Associated with GoU Funded Section of the Road

19. The Project has already been subject to ZVOS and the relevant approvals have been given by Glavgosecoexpertiza of Goskompriroda. However, in accordance with the concept of an associated facility (ADB SPS. Appendix 1, para. 6) the sections funded by the GoU are considered associated facilities to this project. Accordingly a due diligence exercise of the GoU funded sections has been undertaken as part of this IEE to determine what potential significant impacts currently exist, or may arise as a result of construction activities in these portions of the road.

6. Mitigation Actions

20. The summary mitigation measures for the potential impacts identified above for the ADB funded portions of the Karshi – Shahrizabz - Kitab Road includes:

Design / Pre-construction Phase

(i) SSEMP – To ensure that all of the potential mitigation measures are applied during the construction phase, the Contractor shall be responsible in the pre-construction phase for the preparation of his Site Specific Environmental Management Plans (SSEMP). The Engineer shall be responsible for reviewing and approving the SSEMP.

(ii) Siting of Facilities – During the pre-construction phase the Contractor shall consult with the Engineer, local Khokimyats, the EA and Goskompriroda to

determine the locations of construction camps and ancillary facilities, such as concrete batching plants. Correct siting of these facilities will help reduce noise and air quality impacts.

(iii) Permits – The Contractor shall be responsible for obtaining all of the required environmental permits prior to the start of construction. All permits will be reviewed by the Engineer before construction work commences.

(iv) Climate Change - The Tashkent Design Institute (TDI) should undertake an assessment of climate change impacts and how they may potentially impact the road including; a) the assessment of the use of advanced concrete materials and structures to help improve the durability of concrete infrastructure and their adaptation to climate change; b) Assessment of 1/50 year flood return period for all bridges and roads embankment; c) assess designs of piers, abutments and embankments to determine if protection methods (e.g. rip-rap) are required to cope with additional water volumes and increased flow intensity; and d) consider adopting plastic joint profiles made of ethylene-propylene-diene monomer rubber (EPDM) to improve the resilience of road joints.

(v) Bridge Design - Bridge designs should ensure that drainage from bridge decks over 50 meters does not discharge directly to the watercourses beneath the bridges. If possible the discharge waters should lead to a filter pond adjacent to the bridge in order to trap oil and grease run-off. In addition, the bridge design and layout must be aesthetically pleasing and in harmony with the existing environment.

(vi) Health and Safety - Traffic safety issues shall be accounted for during the design phase of the Project to include; safety barriers, road crossings and speed limits. It is especially important to consider additional traffic safety measures close to schools, including reduced speed limits (maximum 50 kilometers per hour) and traffic calming measures such as speed bumps.

Construction Phase

(i) Dust and Emissions – Proper control, siting and maintenance of equipment, including concrete batching plants, shall mitigate emissions impacts. Spraying of roads with water during dry periods and covering of friable materials will also help prevent dust impacts.

(ii) Water Quality – Proper design, siting and management of facilities (including construction camps and concrete batching plants) will help reduce impacts to water quality. Accidental spills could occur and provisions are recommended in the IEE to manage such accidents.

(iii) Soils – Measures are outlined within the IEE to reduce the impacts of potential spills and leaks. They include storing hazardous liquids in special storage areas within concrete bunds and the provision on spill kits in these areas. Erosion control measures are also recommended within the IEE.

(iv) Tree cutting – During the construction phase the Contractor shall be responsible for planting and maintenance of trees. The local Khokimyat will be responsible for periodic monitoring of the trees to ensure that they are being maintained by the Contractor. Local Khokimyats will be responsible for the maintenance of the trees after the defects liability period.

(v) Important Bird Area - No construction camp, or construction facility, such as a concrete batching plant, shall be constructed within 5 km of the IBA.

(vi) Infrastructure – Before the removal of utilities or other infrastructure (such as irrigation channels), the Contractor shall notify the general public of the potential

disruption and arrangements will be made between the Contractor and those affected to minimize the disruption.

(vii) Noise – Noise levels from construction equipment and vehicles can be reduced by introducing activity time constraints and by ensuring proper siting and maintenance of equipment.

(viii) Waste and Spoil – The Contractor will be responsible for the safe collection and removal of all waste materials from his site. Accordingly, he should prepare contracts with a suitably licensed waste management contractor for the removal of inert and hazardous wastes from his sites. Waste manifests shall also be kept by the Contractor as proof of the shipment of these wastes.

(ix) Health and Safety – Health and safety plans, training and HIV/AIDS awareness programs will be provided by the Contractor. In addition he shall prepare traffic management plans to reduce potential impacts to villagers during construction periods. The Contractor shall also be responsible for providing adequate Personal Protective Equipment for all workers, including sub-contractors and site visitors.

(x) Cultural Heritage – The IEE provides a procedure for chance finds and procedures to limit impacts to the cemeteries closest to the Project road.

Operational Phase

(i) Noise – Further investigation into the issue of operational noise impacts and mitigation is required in the form of noise modeling. A plan to complete noise modeling is outlined in Section E.9.1. The IEE will be updated based on the findings of the noise modeling exercise.

(ii) Air Quality – Air emissions, including dust, could increase during the operational phase of the Project. It is recommended that the EA undertake annual monitoring in urban areas to assess this issue during the operational phase of the Project.

7. Monitoring Actions

21. To ensure that all of the above mitigation actions are completed according to the requirements of this IEEs EMP, monitoring shall be undertaken of Project works by the Engineer and by independent monitoring specialists. Specifically both observational monitoring and instrumental monitoring shall be undertaken on the Karshi - Shahrizabz - Kitab Road as follows:

(i) Instrumental Monitoring – This shall be completed by independent specialists and will include routine air quality, water quality and noise monitoring during the construction phase. Schedules, parameters, locations are indicated by the EMP and shall be adopted by the Contractors SSEMP.

(ii) Observational Monitoring – The Contractors actions shall be continually monitored by the Engineer throughout the Projects Construction phase. This will be achieved through weekly inspections of the Contractors environmental performance by national and international environmental specialists engaged by the Engineer throughout the construction period. The Engineer shall have the right to suspend works or payments if the Contractor is in violation of any of his obligations under the EMP and this IEE.

8. Consultations

22. Stakeholder consultations were undertaken in May, 2016 in Yakkabog, Shahrizabz and Chim. The consultations did not reveal any environmental impacts that could not be mitigated by this IEE. In addition, consultations with the State Committee for Nature Protection (Goskompriroda) in Tashkent did not reveal any specific environmental issues that would result from Project works.

9. Implementation

23. The EMP, its mitigation and monitoring programs, contained herewith shall be included within the Project Bidding documents for project works. The Bid documents state that the Contractor shall be responsible for the implementation of the requirements of the EMP through his own SSEMP which will adopt all of the conditions of the EMP and add site specific elements that are not currently known, such as the Contractors final list of borrow pit locations. This ensures that all potential bidders are aware of the environmental requirements of the Project and its associated environmental costs.

24. The EMP and all its requirements will then be added to the Contractors Contract, thereby making implementation of the EMP a legal requirement according to the Contract. He shall then prepare his SSEMP with the oversight of the Engineers International Environmental Specialist. The SSEMP will then be approved by the EA and monitored by the Engineer and the EA. Should the Engineer note any non-conformance with the SSEMP the Contractor can be held liable for breach of the contractual obligations of the EMP. To ensure compliance with the SSEMP the Contractor should employ a national environmental officer to monitor and report Project activities throughout the Project Construction phase.

A. Introduction

A.1 Purpose of the report

25. This initial environmental examination (IEE) is part of the process of compliance with the ADB's Safeguard Policy Statement in relation to the Kashkadarya Regional Road Project, or the "Project".

26. The IEE provides a road map to the environmental measures needed to prevent and/or mitigate negative environmental effects associated with the development project. The IEE also provides a detailed description of the direct and indirect environmental effects associated with the proposed subproject during key periods of work.

27. More specifically, the IEE:

(i) Describes the extent, duration and severity of the impacts;
(ii) Analyzes all significant impacts;
(iii) Formulates the mitigation actions and presents it all in the form of an Environmental Management Plan (EMP).

A.2 Identification of the Project and Project Proponent

28. The Republican Road Fund (RRF) under the Ministry of Finance will act as the overall technical and administrative authority for this Project. Leading the day-to-day implementation of the project as a whole will be a Program Management Unit (PMU) located within the RRF.

29. The RRF has developed the Project within the framework of the Central Asia Regional Economic Cooperation (CAREC) Investment Program.

A.3 The Nature, Size, Location and Importance of the Project

30. The Project activities funded by the ADB will comprise upgrading of 77 km of two sub-sections of roadway between Karshi and Kitab (see **Figure ES-1**). The project will be confined within the existing right-of-way and will lead to enhanced regional cooperation and inclusive economic growth in Uzbekistan, particularly in the Kashkadarya province and will improve quality and efficiency of road transport service.

A.4 IEE Boundaries

31. For purposes of establishing the environmental conditions, the overview of regional data is followed by the description at the project level if data is available. This IEE covers the entire length of the Project Road funded by the ADB (77 km). For purposes of this impact assessment, an envelope of 200 meters wide on each side of the project road over its entire length is identified as the primary impact area ("Project Area" or "Project Corridor"). This distance takes into account the common impacts associated with road works such as noise, dust and emissions. However, the project impact area maybe widened depending on conditions on the ground and with regard to specific construction sites outside of the right of way (RoW – the Project road RoW varies between 34 meters and 51 meters), e.g. borrow pits and quarries. The road sections where sensitive receptors are present, such as schools, hospitals or other places

where people congregate are given particular attention so that ample mitigation is formulated. For road sections that cross rivers, the impact assessment is expanded to cover the identified continuous extent of any ecologically important habitats / features along the Project Corridor. **Table A-1** indicates the assessment boundaries adopted for the IEE.

Table A.1: Assessment Boundaries adopted for this IEE

Terrestrial Environment	Aquatic Environment	Air Shed	Acoustic Environment
200 m on either side of the road.	50 m upstream and 100m downstream of any project road crossing a river (not including irrigation or drainage channel)	200 m from center line of road (and rising 100 m from the road centerline), and 500 meters from rock crushing plant, batching plants, borrow pits, etc.	200 m from center line of road and extended on sensitive areas such as settlements.

32. In addition to the above, in accordance with the concept of an associated facility (SPS. Appendix 1, para 6) it is necessary to mention that sections funded by Government are associated facilities to this project. A due diligence assessment of the GoU sections of the road is summarized in **Section E.11** of this report.

A.5 Methodology Applied

33. The methodology is based on the ADB, Safeguard Policy Statement (2009) and the joint experience of the International and National environmental consultants involved in the IEE. Background data and information was obtained from published and unpublished sources, e.g., on: climate, topography, geology and soils, natural resources, flora and fauna, agriculture, and socio-economic data. Several site inspections were conducted jointly by the International Environmental Specialist and National Counterpart during April and May, 2016. The existing road was driven and areas of potential environmental significance assessed carefully. Discussions were held with a number of stakeholders in order to determine their perceptions of the level of impact from road works (see **Section F**). Data and information obtained have been included where appropriate in the IEE Report.

A.6 Constraints and Limitations

34. Given the limited available time for the study, and the unavailability in-country of the necessary qualified consultants, modeling of noise impacts was not possible before the first draft of the IEE was submitted to ADB for review. The purpose of the modeling is to determine if the impacts will be significant enough during the operational phase of the Project to warrant additional mitigation measures. The IEE will be amended when the noise modeling has been completed by an independent specialist.

A.7 Structure of the Report

35. The report is organized to comply with ADB Safeguard Policies (2009) as follows:

(i) **Section A: Introduction –** The section in hand provides the introductory information for the Project.

(ii) **Section B: Legal, Policy and Administrative Framework -** This section presents an overview of the policy/legislative framework as well as the environmental assessment guidelines of Uzbekistan that apply to the proposed project. The section also identifies relevant Asian Development Bank Safeguard Policies that will apply.

(iii) **Section C: Description of the Project –** Section C describes the Category of the Project and the need for the Project. A detailed scope of works is also provided indicating the type of engineering works required. The final portion of this section discusses Project alternatives.

(iv) **Section D: Description of the Environment –** This section of the report discusses the regional and local environmental baseline conditions. This section is divided into subsections relating to physical environment, ecological environment, economic conditions and socio-cultural characteristics.

(v) **Section E: Screening of Potential Environmental Impacts and Mitigation Measures –** Section E outlines the potential environmental impacts and proposes mitigation measures to manage the impacts.

(vi) **Section F: Environmental Management Plan & Institutional Requirements –** This section provides the EMP for the Project and a the institutional requirements for its implementation.

(vii) **Section G: Public Consultation, Information Disclosure & Grievance Mechanism –** Section G provides a summary of all of the stakeholder consultation activities undertaken. A grievance mechanism for project affected persons is also provided along with information regarding the disclosure process.

(viii) **Section H: Conclusions and Recommendations –** The final section of the report provides the report conclusions and any necessary recommendations.

B. Legal, Policy and Administrative Framework

B.1 General

36. This section of the IEE presents an overview of the policy/legislative framework as well as the environmental assessment guidelines of Uzbekistan that apply to the proposed project. The section also identifies relevant Asian Development Bank Safeguard Policies that will apply. The project will be required to comply with all relevant national and international environmental and social policies / guidelines.

B.2 Country Policies and Administrative Framework

B.2.1. Overall legal framework

37. Environmental protection is administered in Uzbekistan by the State Committee for Nature Protection (Goskompriroda). Goskompriroda is the primary environmental regulatory agency, and reports directly to the Parliament, and is responsible for the implementation of The Law on Environmental Protection (1992). Specifically, it is responsible for supervising, coordinating and implementing environmental protection and controlling the usage and renewal of natural resources at the central, region and district levels. The mandate of Goskompriroda is based on the Regulation on the State Environmental Committee of the Republic of Uzbekistan (1996).

38. The overarching legislative framework that establishes the legal framework for environmental protection in Uzbekistan is The law “On nature protection” (Law No.754-XII, 1992). The law states legal, economic, and organizational bases for the conservation of the environment and the rational use of natural resources. Its purpose is to ensure balanced relations between man and nature, to protect the environmental system and to guarantee the rights of the population of a clean environment. According to the legislation of the Republic of Uzbekistan, the Cabinet of Ministries of Republic of Uzbekistan, Goskompriroda and the local government bodies are responsible for implementing state laws on environmental protection and management and the use of natural resources. Article 25 of this law states that State Environmental Expertise (SEE) is a mandatory measure for environmental protection, preceded to decision making process. In addition, article 25 says that the implementation of the project without a positive conclusion of SEE is prohibited.

B.2.2. Environmental Impact Assessment

39. State Environmental Expertise (SEE), i.e. preparation of or the review and approval (or rejection) of developments on environmental grounds, is regulated by the Law on Ecological Expertise (2000) and by Decree of the Cabinet of Ministers No 491.31.12.2001: “On approval of the Regulation of the State Environmental Expertise”. Goskompriroda, through its SEE Department (Glavgosekoexpertiza) reviews, inter alia; environmental impact reports, prepares and implements ecological regulations and standards, coordinates environmental programs and elaborates the structure for environmental monitoring and governance of nature reserves. It approves regulations and issues permits for pollutant emissions and may prohibit projects and construction works that do not comply with environmental legislation. According to the article 3 of the abovementioned law Ecological Expertise is carried out in order to determine:

(i) compliance of projected economic and other activities with environmental

requirements in the stages preceding decision making on its implementation;

(ii) level of ecological danger planned or carried out business and other activities, which may have or had a negative impact on the condition of the environment and public health;

(iii) adequacy and reasonableness of the measures provided for the protection of the environment and rational use of natural resources.

40. The main responsible organization for state environmental review is the Main Directorate for State Ecological Expertise (Glavgosecoexpertiza) of Goskompriroda. State environmental expertise of the Republic of Karakalpakstan, Provinces and Tashkent city implements state environmental expertise upon the below objects:

(i) Pre-project and project documentations, operating enterprises and other objects effecting negative impact on environment and population health, objects with special legal status (on activities belonging to Category III and IV)

(ii) Town planning documents for object designing with total 50 thousand population and below

(iii) Project on protected natural areas management plans

41. All economic activities subject to SEE are classified into one of four categories:

(i) Category I – Corresponds to ADB category A;

(ii) Category II –Corresponds to ADB category B;

(iii) Category III –Corresponds to ADB category B or C;

(iv) Category IV - Corresponds to ADB category C. [2]

42. According to the paragraph 11 of the Regulation, evaluation stages of the environmental impact should include the following basic issues (depending on the type and nature of work):

(i) Stage 1: Draft Statement on Environmental Impacts (DSEI) ('PZVOS' is the national acronym) to be conducted at the planning stage of the proposed project prior to development funds being allocated. This stage is similar to the scoping stage used in EIA.

(ii) Stage 2: Statement on Environmental Impact (SEI) ('ZVOS' is the national acronym) to be completed where it was identified by the Glavgosecoexpertiza at Stage I that additional investigations or analyses were necessary. The Statement must be submitted to the Glavgosecoexpertiza before approval of the project's feasibility study, and therefore before construction. The Statement is required:

[2] Based on the report "Uzbekistan Regional Roads and Development Project (P146334) Environmental and Social Management Framework" World Bank, March, 2015. Note – the WB and ADB EIA categories are broadly the same.

- Assessment of environmental problems of the chosen site on the results of engineering-geological investigations, modeling and other necessary researches;

- Environmental analysis of technology applied to the issues identified on the site;

- The results of the public hearings (if necessary);

- Reasoned investigations of the nature-conservative measures to prevent the negative consequences of the expertising object.

(iii) Stage 3: Statement on Environmental Consequences (SEC) ('ZEP' is the national acronym) represents the final stage in the SEE process and is to be conducted before the project is commissioned. The report details:

- Correction of the design decisions and other taken measures on the consideration of the DSEI by the bodies of Goskompriroda, as well as on the proposals made at the public hearings;

- Environmental regulations governing the activities of the expertising object;

- Requirements for the organization of work and the implementation of measures for environmental guiding of the operation of the object.

43. At Stage 3 Goskompriroda, working at both the state and oblast levels, defines the pollution limits the project is permitted to reach. Uzbekistan prescribes the maximum review period for Goskompriroda as 30 days review for Cateory I and II projects and 20 days for category III and 10 days for Category IV projects.

44. The Project has already been subject to ZVOS and the relevant approvals have been given by Glavgosecoexpertiza of Goskompriroda.

B.2.2. Administrative Framework

45. As stated above, Environmental protection is administered in Uzbekistan by the Goskompriroda which consists of a central body in Tashkent, and regional and district branches and agencies for scientific and technical support. Goskompriroda, through Glavgosecoexpertiza reviews, inter alia; environmental impact reports, prepares and implements ecological regulations and standards, coordinates environmental programs and elaborates the structure for environmental monitoring and governance of nature reserves. It approves regulations and issues permits for pollutant emissions and may prohibit projects and construction works that do not comply with environmental legislation.

46. The other State bodies within the Uzbekistan administrative framework with relevant environmental responsibilities are as follows:

(i) Ministry of Agriculture and Water Resources (MAWR)
(ii) State Committee for Land Resources, Surveys, Cartography and the State Cadastre (or Goskomgeodezkadastr)
(iii) State Committee for Geology and Mineral Resources (or Goskomgeologia)
(iv) Centre of Hydro-meteorological Service (or Uzhydromet)
(v) Ministry of Health (or MHRUz)

(vi) State Inspectorate for Exploration Supervision, Operations Safety Supervision of Industry, Mining and Utilities Sector (or Sanoatgeokontekhnazorat)
(vii) Ministry of Internal Affairs (or MVD).

B.3 Air, Water, Noise and Waste Standards and Regulations

47. Uzbekistan has a large set of specific standards that refer to emission, effluent, and noise standards, as well as standard to handle and dispose specific wastes ranging from sewage to hazardous wastes. The following summarizes these laws and standards.

B.3.1. Air Quality Legislation and Standards

48. The key regulators dealing with air emissions and ambient air quality in Uzbekistan are:

(i) Goskompriroda develops air quality standards to protect the environment, the climate and the ozone layer

(ii) The Ministry of Health who develops air quality standards (sanitary norms) to protect human health and oversees the compliance with hygienic norms and standards associated with air quality.

49. The key legislation relating to air emissions and ambient air quality in Uzbekistan applicable to the Project includes the following:

(i) Law of the Republic of Uzbekistan on Atmospheric Air Protection - No.353-I of 27.12.1996 (as amended on 10.10.2006). It describes regulations on atmosphere protection and its objectives. It specifies standards, quality and deleterious effect norms, requirements on fuels and lubricants, production and operation of vehicles and other transport means and equipment, ozone layer protection requirements, obligations of enterprises, institutions and organizations toward atmospheric protection, and compensations for damages from atmospheric pollutions. The Cabinet of Ministries of the GoU, Goskompriroda and local government bodies are responsible for implementing the law.

(ii) Law of the Republic of Uzbekistan on State Sanitary Control - No.657-XII of 03.07.1992 (as amended on 03.09.2010). It regulates social relations on sanitary-epidemiological well-being and radiation safety, the right of persons to a healthy environment and other associated with it, the rights and guarantees of their implementation.

(iii) Criminal Code, Section 4. Environmental Crimes approved on 22.09.1994 (as amended on 04.01.2011). It is specifies the conception and defines punishment for violation of the norms and requirements of environmental safety, willful concealment or misrepresentation of environmental pollution, violation of flora and fauna, water, land, subsoil, protected areas use.

(iv) Law of the Republic of Uzbekistan on Environmental Expertise - No.73-II of 25.05.2000 (as amended on 04.01.2011). It specifies the purposes, objectives and types of environmental expertise. The law defines the qualifications, duties and obligations of environmental experts. Goskompriroda has overall responsibility for implementing this legislation through The Departments of

Glavgosecoexpertiza and Gosecoexpertisa (which are both under Goskompriroda) and the Provincial branches of Goskompriroda.

50. The key sanitary rules and norms include:

(i) List of Maximum Allowable Concentrations (MACs) of pollutants in ambient air of communities in the Republic of Uzbekistan SanR&N RUz No.0179-04.

(ii) Sanitary norms and requirements to protect ambient air in communities of the Republic of Uzbekistan SanR&N RUz No.0246-08.

(iii) List of Maximum allowed concentration (MAC) of pollutants into the atmosphere air of settlements in Uzbekistan SanR&N No 0293-11.

(iv) List of maximum permissible concentration (MPC) - microorganism-producers in the air of settlement areas SanR&N No 0147-04.

Table B.1: Ambient Air Quality Standards[3]

Parameter	Unit	Averaging Period	Concentration	Source of Standard
Sulphur Dioxide (SO_2)	$\mu g/m^3$	1 year	50	Uzbekistan
		1 month	100	Uzbekistan
		24 hour	20	IFC
		10 minute	500	IFC
		One time	500	Uzbekistan
Nitrogen Dioxide (NO_2)	$\mu g/m^3$	1 year	40	IFC/ Uzbekistan
		1 month	50	Uzbekistan
		24 hour	60	Uzbekistan
		1 Hour	200	IFC/ Uzbekistan
		One time	85	Uzbekistan
Nitrous Oxide NOx	$\mu g/m^3$	1 year	60	Uzbekistan
		1 month	120	Uzbekistan
		24 hour	250	Uzbekistan
		One time	600	Uzbekistan
Carbon Monoxide (CO)	$\mu g/m^3$	1 year	3000	Uzbekistan
		1 month	3500	Uzbekistan
		24 hour	4000	Uzbekistan
		One time	5000	Uzbekistan
Hydrocarbons saturated C12- C19	$\mu g/m^3$	One time	1000	Uzbekistan
Particulate matter PM_{10}	$\mu g/m^3$	I Year	20	IFC
		1 month	80	Uzbekistan
		24 hour	50	Uzbekistan
Particulate Matter $PM_{2.5}$	$\mu g/m^3$	1 year	10	IFC

[3] OLTIN YO'L GAS TO LIQUIDS PROJECT, Environmental, Social, Health and Safety Impact Assessment (ESHSIA), SECTION 4.0 – LEGAL. Golder Associates, 2014.

		24 hour	25	IFC

B.3.2. Water Quality Legislation and Standards

51. Water resources management, allocation and use in Uzbekistan are under the control of the Ministry of Agriculture and Water Resources (MAWR), which oversees national specialized associated, provincial and district departments of agriculture and water resources, and interprovincial and inter-district canal management authorities. The key law relating to water and water use is the Law of the Republic of Uzbekistan on water and water use (No.837-XII of 06.05.1993). It regulates the water relations, rational use of water by the population and economy. The law regulates the protection of waters from pollution and depletion, and prevention and liquidation of harmful effects of water, improvement of water bodies and the protection of the rights of enterprises and institutions, organizations and dehkan farms and individuals in the field of water relations. This Law also authorizes the State (through authorized agencies) to carry out management and control of water use and protection. The following special state agencies are authorized to regulate water use:

(i) MAWR (surface water);
(ii) State Committee for Geology and Mineral Resources (Goskomgeologia);
(iii) State Inspectorate for Exploration Supervision, Operations Safety Supervision of Industry, Mining and Utilities Sector (or *Sanoatgeokontekhnazorat*).

52. Key regulations relating to water quality and use include:

(i) Regulation Document on Regulations on rationing discharges of pollutants into water bodies and on the terrain, taking into account technically achievable performance of wastewater treatment (RH 84.3.6:2004).
(ii) Regulation Document on Order of endorsement and approval of projects of wastes disposal and limits for its disposal (RH 84.3.22:2006).
(iii) Hygiene requirements for the protection of surface waters in RUz SanR&N No 0172-04 Main criteria for hygienic assessment of the level water bodies contamination for health risks population in Uzbekistan (SanR&N No 0255-08).
(iv) Sanitarian requirements for development and approval of maximum allowed discharges (MAD) of pollutants discharged into the water bodies with waste waters (SanR&N No 0088-99).

Table B.2: Maximum Allowable Concentrations to Water[4]

#	Parameter	MAC (River)	MAC (Canal)
1	Ammonium (NH_4+)	0.50 mg/l	1.50 mg/l
2	Nitrate (NO_3)	9.10 mg/l	25.0 mg/l
3	Nitrogen Dioxide (NO_2)	0.02 mg/l	0.50 mg/l
4	Sulphate (SO_2)	100 mg/l	-
5	Phosphate (PO_4)	0.3 mg/l	1.00 mg/l
6	Calcium (Ca)	180 mg/l	-
7	Iron (Fe)	300 µg/L	-
8	Barium (Ba)	100 µg/L	-

[4] http://nodaiweb.university.jp/desert/pdf/JALS-P17_195-198.pdf

9	Chromium (Cr)	500 µg/L	-
10	Nickel (Ni)	100 µg/L	-

B.3.3. Noise Standards

53. In order to provide rules on acceptable noise levels for habitable areas Uzbekistan utilizes the law (SanPiN) number 0267-09. This law presents a table of noise levels for a variety of internal and external applications, the most relevant of which is replicated below in **Table B.3**. Uzbek standards are in line with IFC standards as indicated in **Table B.3**.

Table B.3: Noise Limits from SanPiN No. 0267-09 & IFC EHS Guidelines

Location	Time	SanPiN No. 0267-09	IFC Standards (7am – 11pm / 11pm – 7am)
Areas adjacent to homes, clinics, dispensaries, rest homes, boarding houses, boarding homes for the elderly, childcare facilities, schools and other educational institutions, libraries	From 7 am to 11 pm	55 dB(A)	55 dB(A)
	From 11pm to 7 am	45 dB(A)	45 dB(A)

54. In order to protect the health of staff in the workplace Uzbekistan utilizes the law (SanPiN) number 0120-01 – "Sanitary norms and rules to ensure acceptable noise levels in the workplace". This law presents a table of noise levels for a variety of internal and external applications, the most relevant of which is replicated below in **Table B.4**. In addition, the IFC provide noise limits for various working environments which are also illustrated in **Table B.4**.

Table B.4: Work Environment Noise limits

Type of Work, workplace	SanPiN No. 0120-01 /	IFC General EHS Guidelines
Performing all types of work on the permanent workplaces in industrial premises and in the enterprises operated from March 12, 1985	80 dB(A)	-
Heavy Industry (no demand for oral communication)	-	85 Equivalent level LAeq,8h
Light industry (decreasing demand for oral communication)	-	50-65 Equivalent level LAeq,8h

B.3.4. Waste Regulations

55. The Cabinet of Ministers of Uzbekistan sets and approves national policies, strategies, programs and procedures relating to waste management including allocation of hazardous waste disposal sites and adjustment of waste disposal charge rates as set forth in Article 5 of

the Law on Wastes. Local governments are responsible for waste management policies, strategies and procedures at the local level.

56. The key law relating to waste is the Law on Wastes (No.362-II of 05.04.2002 (as amended on 04.01.2011)). It addresses waste management, exclusive of emissions and air and water pollution, and confers authority to Goskompriroda concerning inspections, coordination, ecological expertise and establishing certain parameters with regard to the locations where waste may be processed. Dangerous waste that is transported domestically or internationally must pass ecological certification and be moved by special vehicles.

57. The principal objective of this law is to prevent negative effects of solid wastes on people's lives and health, as well as on the environment, reduce wastes generations, and encourage rational use of waste reduction techniques in household activities. The law regulates the procedures for treating solid wastes and defines the authorities of various institutions involved in solid wastes management. The law also stipulates the rules for transporting solid wastes and provides market base incentives for efficient treatment of solid wastes. The Cabinet of Ministries of the GoU, Goskompriroda, Ministry of Health, Uzbek Agency "*Uzkomunhizmat*", Agency on supervision for safe operation in the industry and mines inspectorate (hereinafter Agency "*Sanoatkontekhnazorat*") are responsible for implementing the law.

58. Other relevant regulations, standards and norms include:

(i) Order of disposal of hazardous chemicals and hazardous materials on special landfills, their protection and maintenance, approved by Goskompriroda, Ministry of emergency situations, Ministry of Finance, Ministry of Healthcare, No. 2438 of 20 March 2013. The regulation provides definitions of hazardous chemicals, toxic materials, special landfills and special transportation vehicles. State organization "Qishloqkimyo" (Agriculture chemicals) is responsible for transportation handling and disposal of hazardous materials.
(ii) Sanitarian Rules of inventory, classification, storage and disposal of industrial wastes SanR&N No. 0127-02.
(iii) Sanitarian requirements on storage and disposal of solid waste in special landfills SanR&N No. 0157-04.
(iv) Sanitary regulations for collection, storage, transportation, disposal and recycling of municipal solid waste SanR&N No. 0068-96.
(v) GOST 17.0.0.05-93 - Unified system of standards for environmental protection and rational use of resources. Waste Data Sheet.
(vi) GOST 30333-95 Material Safety Data Sheet. Basic principles. Information on safety during production, use, storage, transportation, and recycling (adopted as the interstate standard by Uzstandart letter _05/01-144 06.11.2003).
(vii) GOST 17.9.0.2-99 Environment protection. Waste management. Waste Data Sheet. Composition, content, presentation and amendment procedures.

B.3.5. Other Regulations Relating to Road Construction

59. The following section provides a summary of other regulations relating to road construction in Uzbekistan.

(i) Uzbek Law on Automobile Roads (July 03, 1992) states that any construction or reconstruction of roads requires the official approval of the Ecological Committee.

(ii) Law on Protection of Archeological Monuments (October 13, 2009). Regulation of the relations in the range of protection and use of cultural heritage objects which is national property of Uzbek people.

(iii) ShNK 2.05.02 – 07; KMK 2.05.03-97 Building Code & Regulations for Automobile Roads Environmental Protection: Indicates the general need to minimize adverse environmental impacts in road design and provides for instructions on the removal and re-use of top soil; the need to provide buffer between the road and populated areas and to carry out noise reduction measures to assure compliance with the relevant sanitary norms; on the dumping of excess materials.

(iv) The Law of the Republic of Uzbekistan on Sanitary and Epidemiological Safety, 1995 Section III: Responsibilities of State Bodies, Agencies, Companies on the Provision of Sanitary and Epidemiological Safety: General framework provisions on the requirement to provide healthy and safe conditions at workplaces and work camps (and many others) in compliance with the relevant sanitary hygiene, construction regulations and norms.

(v) ShNK 3.06.03 – 08; KMK 3.06.04-97 Norms of Construction Safety: Detailed regulations on construction worker's health and safety. Chapters 2 and 5 provide organizational procedures of construction and work sites and material transport. Annex 9 contains standards on maximum concentrations of toxic substances in the air of working zones; Annex 11 states that workers need to be informed and trained about sanitation and health care issues and the specific hazards of their work.

(vi) Guidelines for Road Construction, Management and Design, Part I: Planning of Automobile Roads: Addresses environmental issues in road design, construction and maintenance. Part II: Construction of Automobile Roads: Requires that the impacts on the ecological, geological, hydro-geological and other ecological conditions are minimized by implementing adequate protective measures. Part III: Protection of the Environment: Requires the consideration of appropriate protection measures, which shall contribute to the maintenance of stable ecological and geological conditions as well as the natural balance. Provides general overview on the requirements for environmental protection.

(vii) KMK 2.01.08-96; ShNK 2.07.01-03; KMK 2.10.09-97 Regulations on Environmental Protection in Construction, Rehabilitation and Maintenance of Roads: Comprehensive provisions on environmental protection measures of surface and groundwater resources; protection of flora and fauna; use, preparation and storage of road construction machinery and materials; servicing of construction machinery; provisional structures; provisional roads; fire protection; borrow pits and material transport; avoidance of dust; protection of soils from pollution, prevention of soil erosion etc. The appendices to this document also state standard for: maximum permitted concentrations of toxic substances; noise control measures; soil pollution through losses of oil and fuel from construction equipment; quality of surface water. (see **Appendix M** for the main conditions of the regulations).

B.3.6 International Conventions and Agreements

60. The Republic of Uzbekistan has ratified the following international conventions that are part of this environmental examination.

Table B.5: International Conventions and Treaties

#	International Conventions and Treaties	Date of ratification	Date of coming into force for Uzbekistan
1	UN Framework Convention on Climate Change	20 June 1993 (acceptance)	21 March 1994
2	Kyoto Protocol to UNFCCC	20 October 1999	16 February 2005
3	Montreal Protocol on Substances that Deplete the Ozone Layer (with London, Copenhagen, Montreal amendments)	18 May 1994 (succession) London – 01.05.1998; Copenhagen – 01.05.1998; Montreal – 07.09.2006.	18 May 1993 London – 08.09.1998; Copenhagen – 08.09.1998l; Montreal – 29.01.2007.
4	Vienna Convention on the Protection of Ozone Layer	18 May 1993 (succession)	18 May 1993
5	Ramsar Convention on Wetlands of International Importance Especially as Wildlife Habitat	30 August 2001 (accession)	8 February 2002
6	UN (Rio) Convention on Biological Diversity	6 May 1995 (accession)	17 October 1995
7	Convention on International Trade in Endangered Species of Wild Fauna and Flora	25 April 1997 (accession)	8 October 1997
8	Convention on Migratory Species of Wild Animals	1 May 1998 (accession)	1 September 1998
9	Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	22 December 1995 (accession)	7 May 1996
10	United Nations Convention to Combat Desertification	31 August 1995	29 January 1996
11	UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes (UNECE Water Convention)	9 August 2007 (accession)	3 December 2007
12	Convention on the Law of the Non-Navigational Uses of International Watercourses	9 August 2007 (accession)	Has not entered into force yet
13	Paris Convention on Protection of the World Cultural and Natural Heritage	22 December 1995	15 June 1996

B.4 Asian Development Bank Safeguard Policies 2009

61. The ADB has three safeguard policies that seek to avoid, minimize or mitigate adverse environmental impacts and social costs to third parties, or vulnerable groups as a result of development projects[5].

[5] ADB. 2009. Safeguard Policy Statement, Manila

Safeguard Requirements 1: Environment.

62. The objectives are to ensure the environmental soundness and sustainability of projects, and to support the integration of environmental considerations into the project decision-making process. Environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts. Eleven 'Policy Principles' have been adopted as part of the SPS, including:

(i) Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks. (*The Project was initially screened by the ADB and classified as a Category B project*)

(ii) Conduct an environmental assessment for each proposed project to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary and global impacts, including climate change. Use strategic environmental assessment where appropriate. (*The IEE herewith provides the environmental assessment for the Project, including an assessment of climate change. Transboundary impacts are not applicable*).

(iii) Examine alternatives to the project's location, design, technology, and components and their potential environmental and social impacts and document the rationale for selecting the particular alternative proposed. Also consider the no project alternative. (*Alternatives have been considered, including the 'no project' alternative in* ***Section C.7 – Alternatives***)

(iv) Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset adverse impacts and enhance positive impacts by means of environmental planning and management. Prepare an environmental management plan (EMP) that includes the proposed mitigation measures, environmental monitoring and reporting requirements, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators. Key considerations for EMP preparation include mitigation of potential adverse impacts to the level of no significant harm to third parties, and the polluter pays principle. (*An EMP has been prepared for the Project and is outlined in detail in* ***Section F - Environmental Management Plans and Institutional Requirements****).*

(v) Carry out meaningful consultation with affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the

project's environmental performance. *(Consultations were held in Chim, Yakkabog and Shahrizabz to discuss environmental issues, the findings of the consultations (and a description of the Project grievance redress mechanism) are presented in* ***Section G - Public Consultation, Information Disclosure & Grievance Mechanism****)*

(vi) Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders. (*This IEE and its EMP will be disclosed on the ADB web-site*)

(vii) Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports. (The IEE and its EMP outline a plan to monitor the implementation of the EMP and the institutional responsibilities for monitoring and reporting throughout the Project lifecycle: **Section F.2 - EMP Institutional Responsibilities**)

(viii) Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the over all benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources. (*No critical habitats have been identified that would be significantly impacted by the Project*)

(ix) Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phase-outs. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides. *(The IEE and its EMP outline specific mitigation and management measures to prevent and control pollution:* ***Section F - Environmental Management Plans and Institutional Requirements.*** *No pesticides will be used during the lifecycle of the Project****)***

(x) Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities. *(The IEE and its EMP outline the requirement for specific health and safety plans and*

emergency response plans: ***Section F - Environmental Management Plans and Institutional Requirements.)***

(xi) Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of "chance find" procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation. *(With the exception of a couple of cemeteries, no physical and cultural resources have been identified that would be significantly impacted by the Project. A chance find procedure is provided in* ***Section E.9.4 – Physical and Cultural Resources****)*

Safeguard Requirements 2: Involuntary Resettlement.

63. The objectives are to avoid involuntary resettlement wherever possible; to minimize involuntary resettlement by exploring project and design alternatives; to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and to improve the standards of living of the displaced poor and other vulnerable groups. The safeguard requirements underscores the requirements for undertaking the social impact assessment and resettlement planning process, preparing social impact assessment reports and resettlement planning documents, exploring negotiated land acquisition, disclosing information and engaging in consultations, establishing a grievance mechanism, and resettlement monitoring and reporting.

64. The involuntary resettlement requirements apply to full or partial, permanent or temporary physical displacement (relocation, loss of residential land, or loss of shelter) and economic displacement (loss of land, assets, access to assets, income sources, or means of livelihoods) resulting from (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas. Resettlement is considered involuntary when displaced individuals or communities do not have the right to refuse land acquisition that results in displacement. A land acquisition and resettlement plan (LARP) has been prepared for the Project to ensure compliance with the safeguard on Involuntary Resettlement.

Safeguard Requirements 3: Indigenous Peoples.

65. The objective is to design and implement projects in a way that fosters full respect for Indigenous Peoples' identity, dignity, human rights, livelihood systems, and cultural uniqueness as defined by the Indigenous Peoples themselves so that they (i) receive culturally appropriate social and economic benefits, (ii) do not suffer adverse impacts as a result of projects, and (iii) can participate actively in projects that affect them.

66. For operational purposes, the term Indigenous Peoples is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees:

(i) self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
(ii) collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
(iii) customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and

(iv) a distinct language, often different from the official language of the country or region.

67. In considering these characteristics, national legislation, customary law, and any international conventions to which the country is a party will be taken into account.

68. Guidelines provide a rational approach for determining environmental category of the Project, the need for public consultation and disclosure, environmental management planning, and resolving involuntary resettlement, indigenous people and gender issues.

69. Activities carried out under the project needs to conform to current laws in Tajikistan and sound social and environmental principles. In general, the project activities will not trigger serious impacts on physical and human environment.

C Description of the Project

C.1 Type of project

70. The Project is a road rehabilitation project involving 127 km of roadway between Karshi and Kitab via Shahrizabz (**Figure C-1**) rehabilitated in four sub-sections, two of which will be funded by the ADB under this specific Project (77 km ADB funded), and the remaining two funded by the GoU (50 km).

Figure C.1: Karshi - Shahrizabz - Kitab Road (Including ADB and GoU Sections)

71. The project will be confined within the existing right-of-way with no significant changes in alignment except where the standards require it, e.g. road curvatures. **Appendix L** indicates the minor realignments of the road within the existing RoW. The four sub-sections are funded by the ADB respectively the GoU as shown in **Table C.1** and illustrated by **Figure C.2**.

Table C.1: Project Road Sections

Sub-Section	Length (km)	Road Name	IEE Road Chainage	Funding Entity
1	28	4R79	0-28	GoU
2	**48**	**4R79 (36km)** **4K319 (12km)**	**28-76**	**ADB**
3	22	4K319 (6km) 4R84 (5km) M39 (11km)	76-98	GoU
4	**29**	**M39 (29km)**	**98-127**	**ADB**

72. The IEE herewith focuses predominantly on the two sub-sections funded by the ADB. However, it will also consider the GoU sections of the road as 'associated facilities' and thereby

assess potential impacts of these portions of the road as far as is practical as given the advance state of works in these sections.

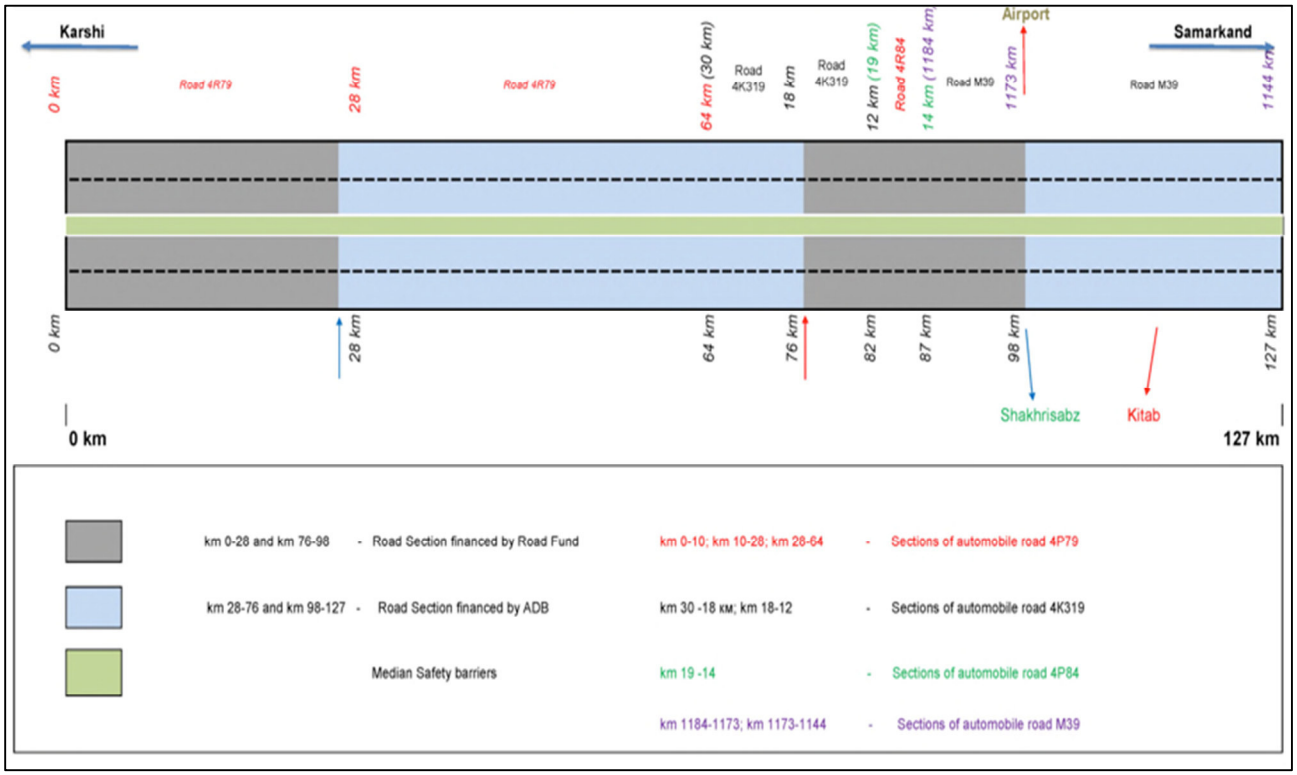


Figure C.2: Project Road Sections

C.2 Category of Project

73. Based on the existing ADB Environmental Safeguards Policy (2009), this Project falls under ADB's project **Category B**. This category is defined as:

"*Projects with potential to cause less significant fewer environmental impacts than Category A, yet still require a prescribed level of environmental management to protect the environment. For these projects an initial environmental examination (IEE) could be considered as final environmental assessment report if the stated document determines that an environmental impact assessment (EIA) is not required for the project under examination*".

C.3 Need for the Project

C.3.1 General

74. The road network is a key element of the economy of the Republic of Uzbekistan. Its effective functioning and sustainable development are important for its economic growth, integrity and national security, as well as to improve living standards and livelihoods. Roads are an essential part of the transport infrastructure. The share of road transport accounts for 89.2% of the volume of freight traffic. On average, vehicle fleet increased by 7 - 10% annually in the

country. In addition to the traditional transportation to a distance of 250-300 km, recent trends show that there is steady development of long-distance transportation.

75. The primary economic benefits of the investment program will be cost saving operation of vehicles and time savings, and savings on other transaction costs related to transportation. Studies using surveys have shown that majority of the trips are linked to business objectives. However, most of the goods transported are perishable goods such as fresh agricultural commodities, and in lesser extent building materials. A small part of the traffic is associated with commuting to and back from works. These travellers will benefit from the reduction of the time spent on the road.

76. In addition to the above, the EA have identified the following benefits:

(i) Establishment of an effective area of international transport corridors;
(ii) Improving the industrial and economic status in Kashkadarya region;
(iii) Improving the welfare of the population of Kashkadarya region, the creation of an economic base to raise the living standards of the population and generate additional jobs and attracting foreign investment;
(iv) Improving the efficiency of road transport;
(v) Increase in freight and passenger transport by improving the quality of roads;
(vi) Improve the capacity of the road axle load to 13 tons; and
(vii) Improve road safety.

C.3.2 Status of the Project Road

77. The following section summarizes the current status of the Project road in its entirety (including the GoU sections):

(i) The road section km 0-64 of 4R79 (km 0-28 funded by GoU / km 28-64 funded by ADB) starts in Karshi. For the first eight kilometers the road has four lanes, which corresponds to category I road roadway width of 14-21 m, the rest of the road has two lanes of traffic covering the width of 8-12 m. The current thickness of the coating of asphalt concrete is 5-20 cm, the upper layer of the base material is 6-15 cm, the lower layer of the base material is sandy gravel 8- 40 cm thick. The status of the existing pavement in this section is unsatisfactory: over large areas there are cracks and fractures, potholes, rutting, depression, and other defects.

(ii) The road section of 4K319 (km 64 – 76 funded by ADB / km 76 – 82 funded by GoU) currently has two lanes and is classified as a category II road. The main part of the road passes through the district center Yakkabog and has similar defects as the first portion of the Project road, e.g. cracks and fractures, potholes, rutting, etc,. On the road, there is one unguarded railway crossing. The width of the road ranges from 8-16 m. The thickness of the coating of asphaltic concrete is 5-16 cm with a base layer of sandy gravel 8-50 cm thick.

(iii) The road section of the Road 4R84 (km 82 – 87 funded by the GoU) passes through the edge of the district center Yakkabog and has two lanes (category II). The road surface is in poor condition, with cracks and fractures, potholes, rutting, etc,. There are no sidewalks, bus stops and lighting. The coating thickness of the

asphaltic concrete is 4-16 cm, the upper layer of the base material is 6-22 cm (sometimes it is not present), the lower layer of the base of the roadway is sandy gravel 6-42 cm.

(iv) The road M-39 (km 87 – 98 funded by the GoU / km 98 – 127 funded by ADB) corresponds to a category I road. The road comprises cement concrete and asphalt surfacing. On the cement concrete section the pavement (width 16-21m) has cracks, chipped corners and joints in poor condition.

78. In addition to the above, the EA have identified several issues with the roadway in its current form that need to be remedied:

(i) All four road sections have longitudinal gradients, corresponding to the requirements of the standards, but in some places, there are curves with radii which is less than acceptable, and there is no visibility of the road in some areas.
(ii) The status of embankment slope protection, channel walls and culverts is mostly unsatisfactory.
(iii) There are irregularities, cracks, fracture coatings on the roadway, erosion of embankments, etc.
(iv) The dimensions of bridges and overpasses do not meet the increased requirements of the traffic flow. The deck of the bridges are clogged with debris, and in general the bridges are in a poor state of repair.
(v) Traffic management in the form of road markings, road signs, traffic lights, barriers and signal bars, also have serious drawbacks.

79. Traffic counts undertaken by the EA indicate that road traffic on the rehabilitated road will increase substantially by 2033. **Tables C.2 & C.3** illustrates the traffic forecasts for different sections of the road. The average annual average daily traffic in the project area is 12,255 vehicles per day (vpd). The composition of the average flow distributed as follows: passenger cars - 93%, trucks up to 3.5 t - 2%, trucks 3.5-12 tons - 2.5%; trucks over 12 tons - 1.5%, buses - 0.2%, train - 0.5%, tractors and agricultural machinery - 0.3%.

Table C.2: Traffic Forecasts, Vehicles Per day (VPD), 2013 – 2033 - Highway M-39 (at 1173km)								
Year	Structure of the flow, unit per day							Total units per day
	Light duty vehicle	Autobuses	Commercial vehicle up to 3,5 t	Commercial vehicle from 3,5 to 12 t	Commercial vehicle more than 12 t	Auto trains	Tractors and agricultural vehicle	
2013	19,093	45	355	493	260	37	56	20,339
2018	23,208	55	431	599	316	45	68	24,722
2023	29,619	70	551	765	403	57	87	31,552
2028	37,803	89	702	976	515	73	111	40,269
2033	48,247	114	897	1246	657	93	141	51,395

Table C.3: Traffic Forecasts, Vehicles Per day (VPD), 2013 – 2033 - Highway 4R79 (at 52km)								
Year	Structure of the flow, unit per day							Total units per day
	Light duty vehicle	Autobuses	Commercial vehicle up to 3,5 t	Commercial vehicle from 3,5 to 12 t	Commercial vehicle more than 12 t	Auto trains	Tractors and agricultural vehicle	
2013	4,860	31	193	147	235	100	37	5,603
2018	5,907	38	234	179	286	121	45	6,810
2023	7,539	48	299	228	365	155	57	8,691
2028	9,622	61	382	291	465	198	73	11,092
2033	12,281	78	488	371	594	253	93	14,158

80. Accident data provided by the Directorate of Internal Affairs, Road police department between 2006 and 2015 indicates that there have only been three fatalities recorded in the last five years on the road section “railway station Tanhoz – Yakkabog town – Esat village – Kozok village”. Most of the accidents recorded between 2006 and 2015 resulted from vehicle on

vehicle collisions and vehicle – pedestrian collisions. **Appendix G** provides the data in tabular format for this section of the road.

C.4 Locations & Size of Operations

C.4.1 Project Locations

81. The Karshi – Shahrizabz - Kitab Road begins on the outskirts of Karshi, the capital of Kashkadarya Region. The road broadly follows an easterly route until it reaches its destination at a checkpoint approximately 10 kilometers beyond Kitab in Kashkadarya. The road passes through the territories of Karshi, Guzar, Kamashi, Yakkabog, Shahrizabz and Kitab districts within Kashkadarya region.

82. **Figure ES-1** provides a location map of the road within the context of Uzbekistan. **Figure C-1** provides a map of the road within Kashkadarya. **Appendix A** provides an overview of the environmental setting of the road, **Appendix B** provides detailed mapping of the road with chainages.

C.5 Scope of Works

C.5.1 Project Phases

83. The Project is being undertaken in several phases as follows:

(i) **Design Phase & Due Diligence** – A preliminary design has been prepared by the TDI and has been handed over to a team of international consultants (Sheladia) to undertake a Due Diligence. The PPTA due diligence covers technical, economical, and financial, governance, and safeguards aspects. As part of the due diligence Sheladia has reviewed the existing IEE prepared by the government and will update the IEE to meet the ADB requirements (the task in hand). The IEE EMP will be provided to the prospective Contractors with the Bidding Documents.

(ii) **Construction Phase** – During this phase the following activities will be undertaken:

(a) **Land Acquisition -** Under the terms of the Loan of the Asian Development Bank (ADB), before the commencement of the construction works at any part of the site, the *Employer* must prepare the Land Acquisition and Resettlement Plan (the LARP), obtain the approval of ADB and then implement the plan and acquire the land.

(b) **Site Specific Environmental Management Plan (SSEMP)** - Ensure that the Site Specific EMP is submitted to the Engineer for review at least 10 days before taking possession of any work site. No access to the site will be allowed until the SSEMP is reviewed by the Engineer and approved by the Project Management Consultant.

(c) **Site Clearing Works -** The Works include the following site clearing works within or adjacent to the RoW of the Project Road, in accordance with the Drawings or instructions of the Engineer:

- Clearing and grubbing.
- Removal and disposal of traffic signs, sign posts and their foundations.
- Demolition, removal and disposal of existing bridges including foundations, abutments, piers, retaining walls, riverbank and waterway protection works.

- Demolition, removal and disposal of existing culverts, inlet and outlet structures, headwalls, concrete drains, channel lining, and erosion protection works.
- Removal of and any other natural or artificial objects within the RoW.
- Removal and disposal of all vegetation and debris within the designated limits of the Right-of-Way.

(d) **Relocation of Existing Services -** The Works include the relocation of all services affecting the construction of the Project Road within the Right-of-Way. The services include the following

- water mains
- overhead electric supply lines
- gas pipelines
- underground telephone cables
- sewer mains

(e) **Construction Activities** – The main construction phase aspects are described in detail below.

(iii) **Operational Phase** – Commences from the date of Taking Over of the Works by the Employer.

C.5.2 Major Components and Design Characteristics

Road Standards and Typical Profiles

84. The Project Road will be rehabilitated to a Category Ib road. **Table C.4** provide an overview of the Geometric Standards for Category II roads (according to SNiP 2.05.02-85)

Table C.4: Geometric Design Standards for Category Ib Roads

Description	Design Standard			
Road Category	I			
Rural Design Speed (km/h)	120			
Urban Design Speed (km/h)	70			
Cross-sectional Elements (m)	No. of Lanes	Lane Width (m)	Carriageway Width (m)	Shoulder Width (m)
	4 (6)	3,75	2 x 7.5 to 2 x 11.25 m	1.25 - 3.0 m
Cross Slope, %	Roadway		Shoulder	
	1.5 – 2.0		4.0	
Maximum Superelevation %	6.0			
Minimum Radius in Plan (m)	General		Mountain	
	800		600	
Minimum Sight Distance	Stopping		Passing	
	250		450	

85. **Appendix F** illustrates typical cross sections of a Category II road.

Bridges

86. Seventeen bridges will be constructed or widened during the project works. **Table C.5** below provides summary details of the bridges and their locations.

Table C.5: Bridges

Bridge No.	Location (km)	Nearest settlement	Watercourse type/ Name	Bridge length (m)	Number of spans
1	28+740	Karatikan	Canal	31.815 m	3
2	29+625	Karatikan	Collector	36.6 m	3
3	43+025	Chim	Pakhtaabad canal	45.6 m	3
4	45+857	Chim	Collector	18.94 m	1
5	55+375	Mangit	Collector	30.6 m	3
6	61+390	Takbay	Collector	18.5 m	1
7	69+150	Karamurcha	Canal	15.5 m	1
8	71+326	Yangiabad	Collector	19.196 m	1
9	73+625	Esat	Collector	16.46 m	1
10	98+656	Shahrizabz	Collector	27.6 m	3
11	102+525	Shahrizabz	Railway overpass	72.9 m	5
12	103+825	Shahrizabz	Collector	15.5 m	1
13	106+460	Akdarya	Aksudarya river	90.7 m	5
14	108+345	Navkat	Naukhat canal	15.5 m	1
15	113+470	Kitab	Kashkadarya river	72.65 m	4
16	115+985	Ruskishlak	Ankhor canal	18.5 m	1
TOTAL					

87. The construction of new and widening of the existing bridges includes but is not limited to the following parts of the structures and associated works:

(i) Foundations.
(ii) Substructure including bridge bearings.
(iii) Superstructure, including construction of expansion and deformation joints and footpaths.
(iv) Deck pavement including hydro isolation, drainage, hand railing, and conduits for services.
(v) Approach slabs.
(vi) Slope treatments in front and around the abutments.
(vii) Construction and maintenance of traffic detours.
(viii) Scour and erosion protection of the waterway areas and river bank protection upstream and downstream of the bridge crossing, and removal of old foundations and substructure from the waterways.
(ix) All necessary and incidental items required for a complete bridge.

(x) All new and widened bridges will be designed for the life expectancy of 100 years.
(xi) The bridge rehabilitation and strengthening works will be designed for the life expectancy of 50 years.

Culverts

88. Project works include the design and construction of cross drainage structures (culverts), including inlet and outlet structures and associated works in accordance with the Specification. The scope of the cross drainage works includes:

(i) Complete replacement of existing culverts which are old, structurally deficient or undersized;
(ii) Extension of existing culverts which are of adequate design and in good condition;
(iii) Construction of new culverts at locations where no cross drainage structure existed before;
(iv) Cleaning of existing culverts which are partially or completely silted;
(v) Miscellaneous repair of the existing culvert joints, headwalls, wing walls, and scour and erosion protection works; and
(vi) Construction of new scour protection and channel lining works.

89. Approximately 220 culverts will be rehabilitated or constructed as part of the Project. The culverts will be constructed from either reinforced concrete pipe or steel pipe. A schedule of the culvert types and locations is attached as **Appendix O**.

Other Drainage Structures

90. Surface runoff from the carriageway and all other pavements, and any cut and embankment slopes must be discharged through longitudinal drains designed for adequate cross section, bed slopes, invert levels and the outfalls. The Works include construction of the drainage system components in urban and rural areas according to the types, dimensions, classes and material requirements for this work shown on the typical cross section drawings (**Appendix F**).

Earthworks

91. The Works include the following types of earthworks necessary for the construction of the Project Road and all associated works:

(i) Removal of topsoil.
(ii) Construction of embankments.
(iii) Construction of subgrade.
(iv) Excavation and removal of the existing pavement materials and the existing road embankment.
(v) Removal and replacement of unsuitable materials.
(vi) Structural excavation.
(vii) Excavation for the construction of side drainage and cross-drainage works.
(viii) Excavation for the removal and relocation of the existing utilities.
(ix) All backfilling necessary for the construction of bridges, retaining walls or other earth retaining structures, cross drainage structures and associated works, side drains and erosion protection work.

(x) Preparation of beddings and filters for all structural, cross drainage, side drains or pavement works.

(xi) Excavation, filling or backfilling necessary for the execution of any other incidental works.

92. **Table C.6** indicates the approximate earthworks and pavement quantities for the Project Road.

Table C.6: Estimated Earthworks

Description	Unit	Quantity
Clearing and grubbing of trees diameter less than 32cm	no.	27,500
Clearing and grubbing of trees diameter more than 32cm	no.	570
Stripping of topsoil	M^3	65,000
Road bed excavation and excavation in cut	M^3	420,000
Embankment Construction for roads and associated works up to bridge pay lines	M^3	1,565,000
Subgrade Preparation	M^3	1,975,000
Preparation of the underlying granular pavement layer	M^3	115,000
Dismantling of existing concrete structures, loading on trucks and haulage of up to 3km	M^3	425
Removal and transportation of existing bituminous pavement	M^3	100,000
Structural excavation for culverts, headwalls, wingwalls and retaining walls	M^3	250,000
Granular backfill to culverts, headwalls, wingwalls and bedding for culverts	M^3	220,000

Pavement

93. The design of the pavement takes into account the value and function of the road, traffic, reliability and cost, availability of local building materials, soil and climatic and hydrological conditions, operating conditions and maintenance of the road. The following pavement specification has been proposed by the TDI:

(i) Cement concrete pavement B30 (M-400) F100 (sulfate resistant) - 27 cm;

(ii) (CTB) Base course with gravel-sand mixture (cement treated grade M-75) - 20 cm;

(iii) Sub-base course with gravel-sand mixture with the addition of recycled material from the existing pavement - 20 cm; and

(iv) The capping layer of gravel-sand mixture - 25 cm.

94. The project road provides single-layer cement concrete pavement with high strength and a long service life under intense heavy traffic. In order to avoid the destruction of the concrete from the combined effect of the transport load and temperature fluctuations significantly

increases with the length of the plates, the concrete pavement will be constructed to the following standards:

(i) Requirements set to the concrete in the document "GOST 26633-2012 Concrete heavy and fine-grained. Specifications".

(ii) Cement under the "GOST 10178-85 Portland cement and slag. Specifications" and "GOST 22266-94 sulfate resistant Cements. Technical specifications";

(iii) Gravel under the "GOST 8267-93 crushed stone and gravel of solid rocks for construction works. Technical specifications";

(iv) Sand under the "GOST 8736-93 Sand for construction works. Specifications".

Removal of Asphalt

95. The Contractor shall remove the existing bituminous pavement layers and stockpile this material at locations that will be specified by the PMU and instructed by the Engineer. The asphalt will be re-used, where practical, for access roads and temporary roads, after which it will be re-used for shoulder material.

Construction Equipment

96. **Table C.7** and **Table C.8** provide indicative lists of the key equipment required in the construction phase.

Table C.7: Key Equipment - Section 1: Km 28–Km 76 (48 km)		
No.	**Equipment Type and Characteristics**	**Minimum Number required**
1	Bulldozer (>245HP)	4
2	Excavator (>100HP)	12
3	Crushing and screening plant – mobile type at least 150 m3/h including rock material washing machinery	2
4	Concrete Paving Machinery width not less than 9.0 m for 2-layer concrete placing including film-forming machinery	2
5	Small Concrete Paving Machinery width not more than 5.0 m including film-forming machinery	1
6	Front Loader (>135HP)	15
7	Concrete batching plant (>150m3/hr)	2
8	Motor grader (>135HP)	10
9	Vibratory roller (> 13T)	8
10	Tipper truck (10T)	30
11	Tipper truck (16T)	30
12	Mobile concrete carriers (>25T)	25
13	Transit mixer (>6m3)	6

Table C.8: Key Equipment - Section 2: km 98 - km 127 (29 km)		
No.	**Equipment Type and Characteristics**	**Minimum Number required**
1	Bulldozer (>245HP)	4
2	Excavator (>100HP)	12
3	Crushing and screening plant – mobile type at least 150 m3/h including rock material washing machinery	2
4	Concrete Paving Machinery width not less than 9.0 m for 2-layer concrete placing including film-forming machinery	2
5	Small Concrete Paving Machinery width not more than 5.0 m including film-forming machinery	1
6	Front Loader (>135HP)	15
7	Concrete batching plant (>150m3/hr)	2
8	Motor grader (>135HP)	10
9	Bitumen Distributor (>6000 L)	2
10	Asphalt Plant (>100 t/hr)	1
11	Paver (>200t/hr)	2
12	Vibratory roller (> 13T)	8
13	Tandem roller (8T)	4
14	Pneumatic Tyred Roller (>15T)	2
15	Tipper truck (10T)	30
16	Tipper truck (16T)	30
17	Mobile concrete carriers (>25T)	25
18	Transit mixer (>6m3)	6

C.5.3 Source of Materials

97. During the construction phase the main materials used will be gravel and sand excavated from sites at Guzar, Tanhoz, Kitab and Kashkadarya located in Kashkadarya region. These five quarries have a total reserve of more than 380 million m^3, meeting the requirements of GOSTs. According to the TDI and the PMU there is no need for the creation of new sand and gravel quarry's. **Appendix Q** illustrates the approximate locations of the borrow pits and **Table C.9** provides further details of the borrow pits.

Table C.9: Borrow Pits					
#	**Name**	**Location**	**Material**	**Licensed**	**Environmental Conditions**
1	Guzar borrow pit	Located from the right side 22 km away from km 38 of 4R79 road	sand and gravel mix	Yes	An existing borrow pit located in a river bed. Existing residential properties border the east and west boundaries of the site.
2	Tanhoz borrow pit	located from the right side 4 km	sand and gravel mix	Yes	An existing borrow pit located in a river bed. Surrounded by

		away from km 99.5 of 4R79 road			agricultural land the nearest residential properties are more than 500 meters from the site.
3	Kitab Sanoat Qurilish borrow pit	located from the left side 0.2 km away from km 1157.6 of M-39 road	sand and gravel mix	Yes	An existing borrow pit extracting materials from the river bed. Most surrounding land uses are non-residential.
4	Kashkadarya borrow pit	located from the right side 2.1 km away from km 1163.7 of M-39 road.	sand and gravel mix	Yes	An existing borrow pit located in a river bed. Residential properties can be found within 150 meters of the site.
5	Kashkadarya borrow pit	located from the right side 16 km away from km 1173 of M-39 road.	sand and gravel mix	Yes	An existing borrow pit located in a river bed. Surrounded by agricultural land the nearest residential properties are more than 400 meters from the site.

In addition, the following materials will be sourced:

(i) Cement concrete will be supplied from established, licensed cement plants with an average haulage range of 10 km.

(ii) Asphalt will be obtained from the Shaykhan and Tanhoz plants (average distance of haulage from the carriage - 28 km). Cement - from the plant "Kyzylkumcement" (average distance of haulage from the carriage - 234 km). Crushed stone - Shaykhan plant and Kitab MK (average haulage distance - 26 km).

(iii) Reinforced concrete structures, support traffic signs and other concrete structures will be sourced from Kitab plant concrete products (average haulage distance - 51 km).

(iv) Concrete culverts will be sourced from Karshi plant (average haulage distance - 82 km).

(v) Reinforced concrete structures for bridges and overpasses, fences, metal pipes, screens road signs will be sourced from Tashkent (average haulage distance - 444 km).

(vi) Process water will be sourced from local sources (average haulage distance - 5 km).

(vii) Saplings - from Karshi, Shahrizabz, Kitab (average haulage distance - 33 km).

Concrete Batching

98. The Contractor will be responsible for ensuring the concrete batching facilities comply with the conditions outlined in **Section E** and that all necessary permits to operate are obtained from the local authorities. The Contractor will source concrete from existing batching plants or from his own dedicated plant. **Section E** provides explicit conditions for operating batching plants and the conditions for sourcing concrete from existing batching plants.

Technical and Potable Water

99. Approximately 200 m^3 of technical water will be needed per day during the construction phase and around 15 m^3 of potable water per day. Potential locations for the

technical water include the numerous irrigation channels and the Kashkadarya River. Potable water will be sourced from existing water supply pipelines. The final locations of the extraction points (for both technical and potable water) will require the approval of the Engineer and the PMU prior to the start of extraction to ensure that over extraction of water resources does not happen. Potable water will also need to be tested regularly throughout the construction period to ensure it meets the drinking water standards of GoU.

C.5.4 Tree Cutting

100. According to the TDI more than 48,000 trees will need to be cut within the RoW of which approximately 28,000 are within the ADB sections. The following table, **Table C.10** indicates the locations and number of trees to be cut before construction starts.

Table C.10: Locations and Numbers of Trees to be Cut (ADB Section)

District	Section	Affected trees
Kamashi	4P79 / 28,5-35 km	3204
Kamashi	4P79 / 35-42 km	5454
Kamashi	4P79 / 42-58 km	4947
Yakkabog'	4К319 / 12-30 km	6388
Yakkabog'	4P79 / 58-64 km	2376
Shahrizabz	M-39 / 1164-1173 km	1805
Kitab	M-39 / 1144-1154 km	256
Kitab	M-39 / 1154-1184 km	3364
	Total	**27,794**

C.5.5 Temporary Storage Areas

Construction Camps

101. Camp sites will be selected keeping in view the availability of an adequate area for establishing camp sites, including parking areas for machinery, stores and workshops, access to communication and local markets, and an appropriate distance from sensitive areas in the vicinity. Construction camps will be required for all Project Lots. The final locations of the camps will be selected by the Contractor after the approval from the EA and the Engineer.

102. The area requirement for construction camps will depend upon the workforce deployed and the type and quantity of machinery mobilized. For example, the camps may include rock crushing plant and concrete batching facilities. In view of the area required, it will not be possible to locate camp sites within the RoW and the contractors will have to acquire land on lease from private landowners. The construction camp will also have facilities for site offices, workshop and storage yard, and other related facilities including fuel storage.

103. The Contractor will provide the following basic facilities in the construction camps:
- (i) Safe and reliable water supply.
- (ii) Hygienic sanitary facilities and sewerage system.
- (iii) Treatment facilities for sewerage of toilet and domestic wastes
- (iv) Storm water drainage facilities.
- (v) Sickbay and first aid facilities.

104. Detailed criteria for siting of construction camps and establishment of facilities are given in **Section F**.

Storage Areas

105. Temporary storage areas will be required for certain activities, such as the storage of sand and gravels and construction equipment. These storage areas may range in size from anything between 50 m^2 to more than a hectare. The precise locations of these temporary facilities is not known at this stage, as such mitigation measures shall be prepared to ensure that these areas are sited in approved locations.

C.5.6 Road Safety

106. The following elements are provided for traffic control and security on road:

(i) Road signs and indicators;
(ii) Fences;
(iii) Signal posts;
(iv) Traffic markings;
(v) Lighting;
(vi) Traffic lights;
(vii) U-turns;
(viii) Ground for short time stops for vehicles;
(ix) Sidewalks;
(x) Bus stops.

107. Traffic control and safety facilities are designed according to the requirements of SHNK2.05.02-07 "Automobile roads". Road signs will be located and constructed according to the GOST10807-78 "Road signs" and GOST23457-86 "Technical means of traffic management".

108. The main road safety benefits the project will deliver are the following:

(i) Reduced risk of vehicles leaving their lane to avoid potholes and surface deformations;
(ii) Improved sight distances;
(iii) Better separation between pedestrians and vehicles; and
(iv) Better night driving conditions due to wider carriageway and improved pavement centerline markings.

109. Some of these advantages could be partially offset by the higher speeds, which will be possible after the road improvements.

C.6 Contracting and Institutional Issues

Contracting Procedures

110. Contracting Procedures are an essential aspect of the Project Design. The Project shall incorporate procedures which include important safeguards, most notably the Site Specific

Environmental Management Plan (SSEMP), the purpose of which is to make explicit the Contractor's documented and detailed understanding of the requirements of the EMP and to make their implementation both site-specific (e.g., where water quality monitoring will be conducted pursuant to the requirements of the Contract) and time-specific. It is important to note that, to be meaningful, the recommendations of the EMP must go beyond recommendations and become legally enforceable and incorporated in the bid and contract documents.

Monitoring and Supervision

111. Supervision and monitoring are an equally important part of Project design. Supervision and monitoring provisions will be primarily the responsibility of the following:

(i) Engineer. The Engineer will be tasked with specific responsibility to ensure safeguard compliance of civil works - with particular emphasis on the monitoring of implementation of SSEMP and related aspects of the Project. The Engineers team will include one national environmental specialist (NES) and one international environmental specialist (IES).
(ii) Contractor's Environmental Specialist. The Contractor will be required to retain expertise to do this work and must keep that person/firm to oversee the operation throughout the contract period.
(iii) PMU. Responsible for overall EMP implementation and will be assisted by the Engineer. Their tasks include, but are not limited to supervision for overall compliance with SPS 2009 requirements, preparation and submission of environmental monitoring reports and update of IEE during construction in case of technical design changes or unanticipated impacts.

112. More specific recommendations in regard to monitoring and supervision roles and responsibilities are included in **Section F: Environmental Management Plan** and **Section G: Conclusions and Recommendations.**

C.7 Government Funded Road Sections

C.7.1 General

113. The government funded sections of the Project road are approximately 50 km in length over two sections (see **Table C.1** and **Figure C.2**). Although these sections are not funded by the ADB, they are considered 'associated facilities'[6] by the ADB. These portions of roadway, along with the ADB financed sections, have been subject to an environmental assessment (ZVOS) as part of Uzbek legal requirements. The environmental assessment has been approved by the State ecological expertise of Goskompriroda with the following specific conditions:

(i) The project IEE does not consider storm water control in sinkers and oil separators. Considering the fact that storm sewers will be polluted by

[6] Associated facilities can be defined as activities that are not funded as part of the project (funding may be provided separately by the borrower/client or by third parties including government), and whose viability and existence depend exclusively on the project and whose goods or services are essential for the successful operation of the project.

petrochemicals it is necessary to include sinkers and oil separators in the feasibility study.

(ii) The project should reconsider and minimize the amount of trees planned to be cut (48,502).

(iii) It is essential to work with smoke and dust forming equipment in living areas as far as it is possible from houses during the construction and to prevent storage of wastes of the construction close to lands allotted for settlement.

(iv) A tree restoration plan should be prepared. This document should prove the necessity of trees which will be cut off and to provide measures which will minimize this quantity. Also it should cover the planting of new trees and plan of re-cultivation of disturbed land and ways of ecologically proven operating of wastes caused by the construction.

114. This IEE will undertake a summary 'due diligence' exercise of the government sections of the Project road by assessing if the conditions above have been met and if there are any other potentially significant environmental issues that may be occurring during the construction phase of the government sections.

C.8 Alternatives

C.8.1 The No Action Alternative

115. The "No Action" Alternative in this instance is defined as a decision not to undertake the proposed construction of the Project Road. The "No Action" Alternative would result in the continued deterioration of the road, bridges and drainage structures along the RoW, thereby impeding the economic development of the Project Area and the Kashkadarya region. All positive benefits would be foregone. The relatively minor, less than significant environmental impacts (such as noise and short-term air quality impacts due to maintenance activities) and inconveniences (such as traffic diversions) would be avoided in the short-run. In the long-run, however, the steadily declining state of the roadway would severely hamper economic development in the area. In light of these considerations, the "No Action" Alternative is deemed to be neither prudent nor in the best interest of Uzbekistan or those with an interest in, and attempting to assist restoration of, Uzbekistan's well being.

C.8.2 Alignment Alternatives

116. All rehabilitation works will take place within the RoW, as such no alternative alignments have been proposed for the Project.

C.8.3 Alternative Road Corridor

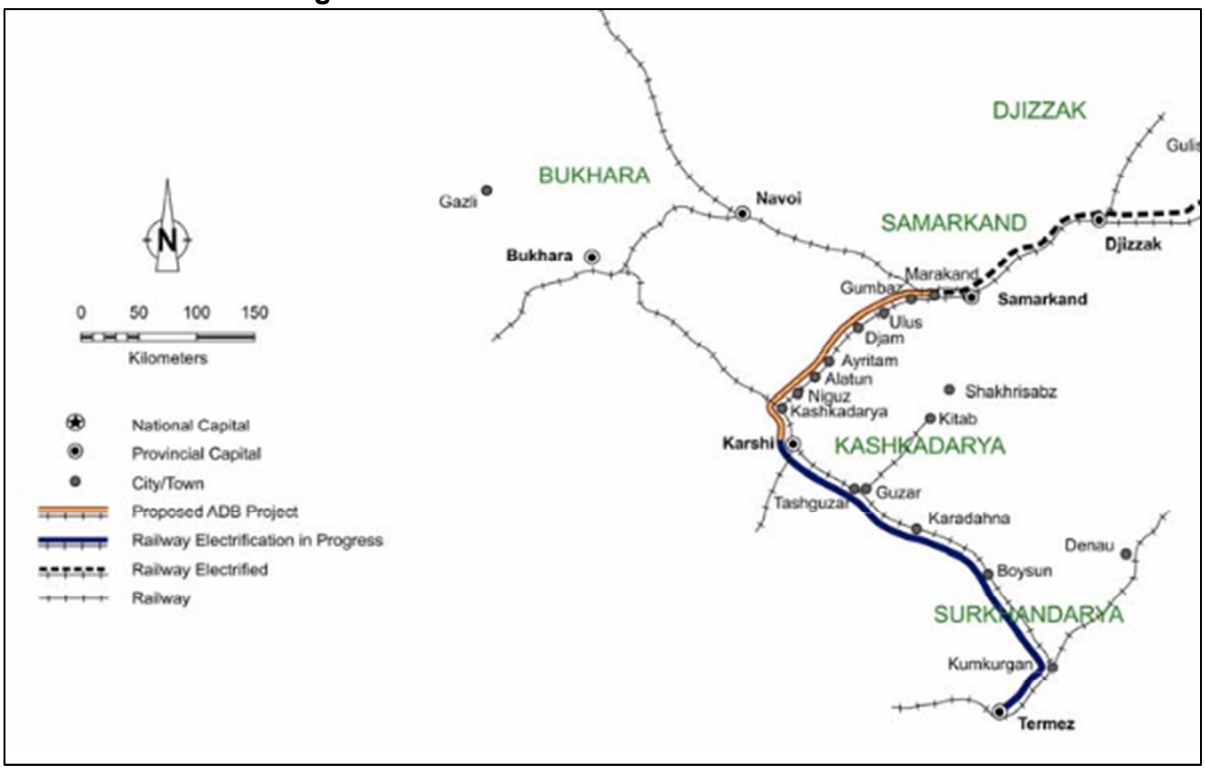
117. An alternative road from Samarkand to Karshi exists (A378) and runs parallel to the north of the Project road (approximately 30-40km north). The A378 provides an alternative option for any traffic moving between these two cities. The travel time from Samarkand to Karshi on the A378 is approximately two hours as opposed to the three hours taking the route through Kitab along the Project road.

118. However, the A378 does not represent an alternative to traffic wishing to travel to Kitab, Shahrizabz, or any other town or village within the Project corridor. The aim of the Kashkadarya Regional Road Project is not simply to stimulate the movement of goods and people between Samarkand and Karshi, and thereby Tashkent and the west and north of the country, rather its aim is also to stimulate the economy within Kashkadarya and improve transport links within the project corridor. If this aim is to be achieved then the only practical option is the development of the proposed Kashkadarya Regional Road Project and no other alternative road corridors need to be assessed.

C.8.4 Alternative Transport Modes

119. A rail line exists between Karshi, and Samarkand which has recently been upgraded and electrified as part of an ADB project (see **Figure C.3**).

Figure C.3: Rail Network in Southern Uzbekistan



120. As shown by **Figure C.3**, the rail line is more than 75 kilometers north of the Project corridor (the figure is slightly wrong in that Shahrizabz and Kitab locations are wrong). The railway is considered necessary as part of a mix of transport modes, with rail promoted as the preferred mode for longer distance, containerized and bulk commodities, as this represents the most environmental and efficient mode of transport. On the other hand, the Project road is

promoted for the local and regional movement of people and goods. Accordingly, the railway is not considered an alternative to the Project but as an additional component of the country wide transport network.

C.9 Proposed schedule for implementation & Cost

Table C.11: Schedule for Project Implementation and Cost	
Project Duration	Three years construction, one year defects liability
Construction Start Date	June 2017
End Date	Last quarter 2021
Cost	266,19 million USD (77 km)

D. Description of the Environment

121. This section of the report discusses the existing environmental and social conditions within the Project corridor of the Project under the following headings:

(i) Physical Resources (air quality, hydrology, topography, etc.);
(ii) Ecological Resources (flora, fauna, protected areas);
(iii) Economic Resources (infrastructure, land use, etc.);
(iv) Social and Cultural Resources (health, education, noise, cultural resources, etc.)

D.1 Physical Resources

D.1.1 Air quality & Climate

Air Quality

122. Uzbekistan is situated in the arid zone, which includes such large natural sources of dust from the Kara-Kum and Kyzyl-Kum deserts with their repeated windstorms, and the Aral Sea area zone (Priaralye) and the dried Aral seabed area (Aralkum). Soil and mineral particles are the main constituents of suspended particulate matters from these sources. In Uzbekistan, SO_2, NO_2 and CO, as well as solid suspended particulates of different composition and origin are the main anthropogenic air pollutants.

123. Within the Project corridor, most houses and buildings within settlements are located outside of the RoW. In addition, all road sections are currently paved with asphalt, or concrete which limits the potential for dust impacts normally associated with un-paved or degraded roads. The road traverses mainly agricultural land and urban settlements. Few stationary sources of emissions were noted within the project corridor with the exception of a couple of concrete batching yards.

124. Monitoring of air pollutants within the project corridor has been undertaken as part of this IEE by independent monitoring consultants. The results of the air quality monitoring (full results provided by **Appendix T**) indicate that only dust was recorded at the three monitoring locations and that the levels were within the limits set by the GoU.

Table D.1: Air Quality Monitoring Results

№	Parameter	**Shakhrisabz km1170 of M-39 (km 103,4 of designed section)**			
		GoU Limit	IFC Limit	Measured value	Compliance
1	Dust	0.5 mg/m^3	-	0,29 mg/m^3	Yes
2	NOx (1 hour)	0.2 mg/m^3	0.2 mg/m^3	0,00 mg/m^3	Yes
4	S0x (ten minute)	-	0.5 mg/m^3	0,00 mg/m^3	Yes
№	Ingredient	**Value (one-time) Chim 37,4 km**			
		GoU Limit	IFC Limit	Measured value	Compliance
1	Dust	0.5 mg/m^3	-	0,28 mg/m^3	Yes
2	NOx (1 hour)	0.2 mg/m^3	0.2 mg/m^3	0,00 mg/m^3	Yes
3	S0x (ten minute)	-	0.5 mg/m^3	0,00 mg/m^3	Yes
№	Ingredient	**Esat 73,2 km**			
		GoU Limit	IFC Limit	Measured value	Compliance
1	Dust	0.5 mg/m^3	-	0,30 mg/m^3	Yes
2	NOx (1 hour)	0.2 mg/m^3	0.2 mg/m^3	0,00 mg/m^3	Yes
3	S0x (ten minute)	-	0.5 mg/m^3	0,00 mg/m^3	Yes

Climate

125. Uzbekistan's climate is classified as continental, with hot summers and cool winters. Summer temperatures often surpass 40 °C (104 °F); winter temperatures average about −2 °C (28 °F), but may fall as low as −40 °C (−40 °F). Most of the country also is quite arid, with average annual rainfall amounting to between 100 and 200 millimeters (3.9 and 7.9 in) and occurring mostly in winter and spring. Between July and September, little precipitation falls, essentially stopping the growth of vegetation during that period of time.

126. The Project Area is located in a climate zone classified as 'cold semi-arid' (see **Appendix I** for the climate classification map). **Figure D-1** illustrates the monthly precipitation levels and temperature for Karshi. Temperatures in Karshi rarely fall below 0 °C in the winter months, but can reach into the 40's during the summer months when hardly any precipitation falls. Precipitation, when it does fall is mostly rain with only 16 days of snow fall per year. Annual rainfall is approximately 250 mm. **Appendix G** provides wind roses for Karshi and Shahrizabz and indicates the predominant winds are from the north and west.

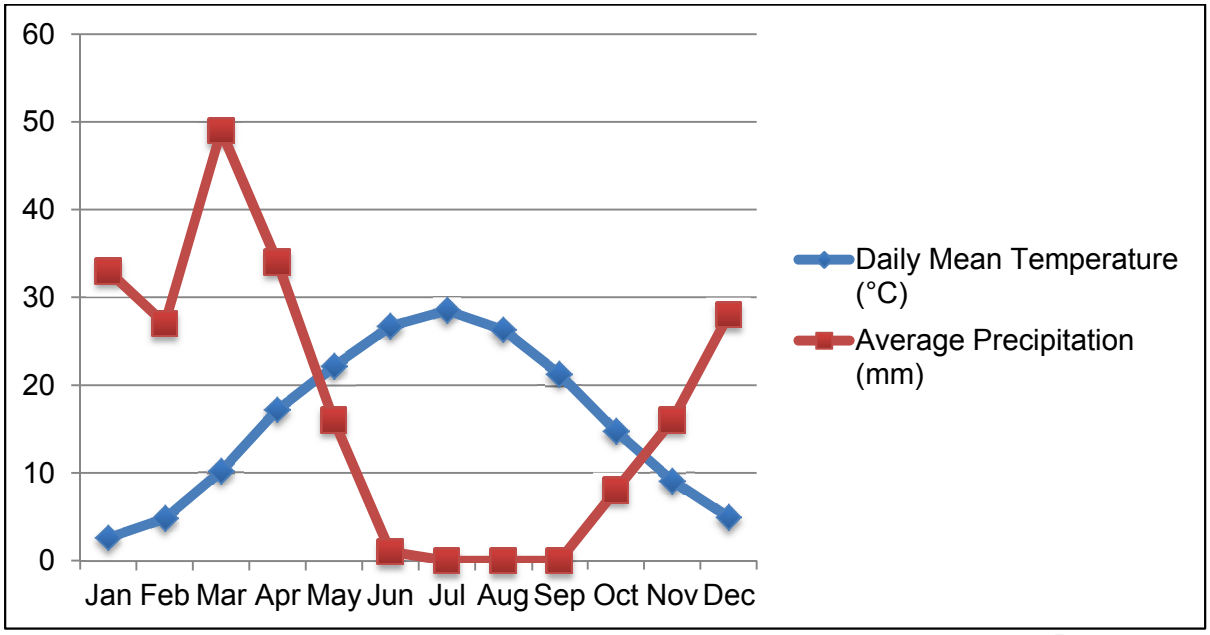


Figure D.1: Mean Monthly and Annual Temperatures In Karshi[7]

Climate Change

127. Uzbekistan is significantly threatened by climate change, with serious risks already in evidence. Climate change is projected to further lead to higher temperatures, changes in precipitation regimes, and more severe and prolonged droughts with corresponding decreases in water availability.

128. Measurements of seasonal temperatures by district show that the average annual temperature has increased in Uzbekistan by 0.29°C since 1951. Furthermore, based on a

[7] http://en.climate-data.org/location/386274/

comparison of two 30-year periods (1951–1980 and 1978–2007), data shows that the number of days with temperatures lower than –20°C has declined by more than 50 % throughout Uzbekistan. Similarly, the number of days with temperatures lower than 15°C has declined by 28–48 % in the northern and mountainous regions of the country. On the other hand, the number of days with high temperatures (higher than 40°C) increased near the Aral Sea by more than 100 %, and in other regions by 32–70 %, except for foothills, where increases were more moderate (10–12 %).[8]

129. Future scenarios indicate that average warming over the next 20 years for the medium scenario will be about 1 – 2.5°C (see **Figure D.2**). Precipitation changes are more uncertain than temperature changes. The medium impact scenario indicates an increase in precipitation of about 48 mm per year in the desert and steppe zones, an increase of 42 mm per year in the piedmont zone, and a decrease of about 10 mm in the highlands zone. Despite an overall increase in precipitation, aridity is also expected to increase across the entire country, most notably in the western parts of Uzbekistan. [9]

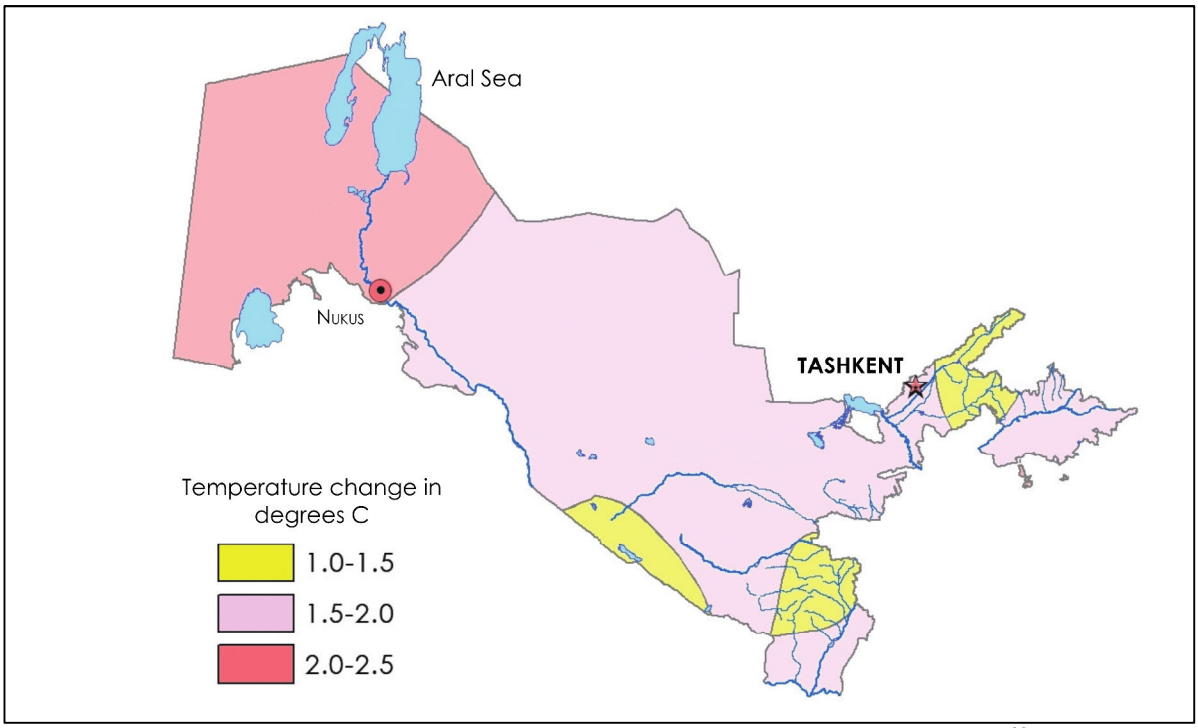


Figure D.2: Temperature Change Scenario towards 2035 [10]

D.1.2 Topography & Seismicity

130. The physical environment of Uzbekistan is diverse, ranging from the flat, desert topography that comprises almost 80 percent of the country's territory to mountain peaks in the east reaching about 4,500 meters above sea level. The southeastern portion of Uzbekistan is

[8] Environmental Performance Review – Uzbekistan. Second Review. UN, 2010
[9] http://infoclimate.org/wp-content/uploads/2014/04/Uzbekistan_Country_Profile-EN.pdf
[10] Environmental Profile of Uzbekistan. UNDP, 2008

characterized by the foothills of the Tian Shan mountains, which rise higher in neighboring Kyrgyzstan and Tajikistan and form a natural border between Central Asia and China.

131. The Project road itself sits within a relatively flat, fertile valley (also known as the Karshi Steppe) framed by two distinct mountain ranges, the Gissar Range to the east and the Zarafshan Range to the north, both of which are parts of the Pamir-Alay system. **Figure D.3** indicates the locations of these mountain ranges in relation to the Project road.

132. Starting 28 km east of Karshi, the road is situated in a relatively flat landscape at around 400 meters above sea level (msl). The road gradually rises approximately 50 meters every 15-20 kilometers as follows; Chim - 450 msl, Karabag - 500 msl, Yakkabog - 580 msl, Shahrizabz – 630 msl, road end point – 800 msl.

133. Uzbekistan is located in the middle of Central Asia within a zone of high seismic activity (see **Appendix J** for a seismic hazards distribution map). According to the Russian seismic code Chimkurgan dam (within three kilometers of the Project road) is located in seismic intensity zone VII according to MSK Intensity scale (Medvedev, Sponheuer and Karnik).[11] In 1999, the country established a law on earthquake disaster preparedness and also special building codes for planning and construction (KMK 2.01.03-96 “Norms and Regulations for Construction in Seismic Zones” and KMK 2.07.01-94 “Town-planning, lay-out and building of urban and village settlements”).

[11] Aral Sea Basin Program Water and Environmental Management Project – Component C – Dam Safety and Reservoir Management: Chimkurgan Dam Safety Assessment Report. March 2000. SMEC

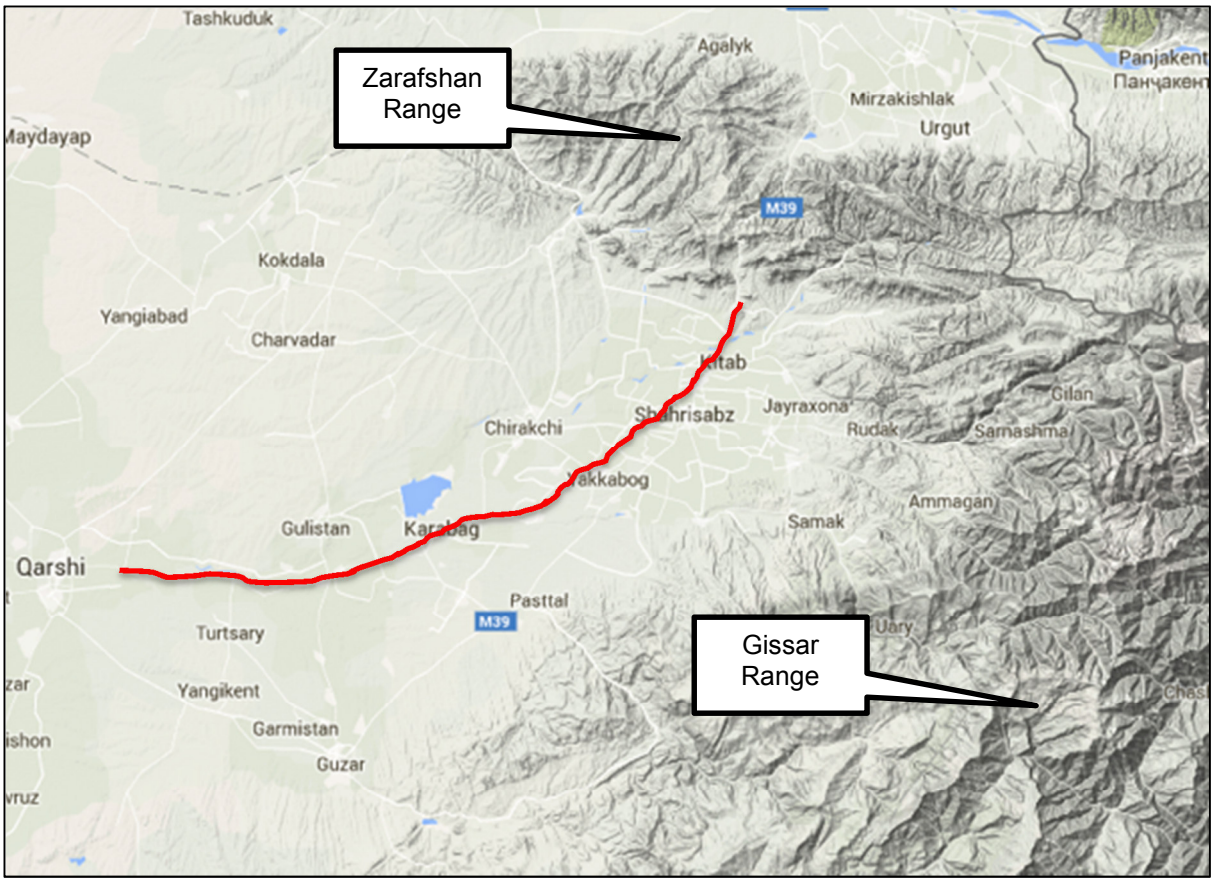


Figure D.3: Regional Topography

D.1.3 Hydrology

134. The Republic of Uzbekistan and the majority of the neighboring countries are situated in the Aral Sea internal drainage basin, transboundary waters of which are in shared use for economic and environmental needs. The fresh waters of the rivers, lakes and reservoirs are used for irrigated farming, industrial and public utility sector needs. The use of low productivity saline lands for agricultural production, in-stream disposal of collector-drainage waters and inefficient wastewater purification systems is currently resulting in deterioration of Uzbekistan's water resource quality and in increase in water salinity.

135. The largest amount of surface water resources (about 90%) is generated in the mountainous areas of neighboring countries. Internal water resources comprise lakes, groundwater resources, rivers and the water reserves of glaciers. Large and small rivers, as well as groundwater, are the main constituents of available water resources in Uzbekistan.

136. The main rivers are the Amu Darya River, formed by the confluence of the Vakhsh and Pyandj Rivers, the Syr Darya River, formed by the confluence of the Narin and Karadarya rivers, and the Chirchik River near Tashkent. The Amu Darya River basin includes the Surkhandarya, Sherabad, Kashkadarya and Zarafshan rivers, but only the Kashkadarya and Sherabad Rivers

are entirely located within the territory of Uzbekistan.[12]

137. The Project road crosses both the Kashkadarya and Aksudarya rivers (see **Figure D.4** and **Figure D.5**). The Kashkadarya river is 378 km in length with a basin of 6,800 km^2. The river rises in a mountain massive located at the junction of the Zarafshan and Gissar ridges. The largest tributaries of the Kashkadarya river are: Djinni-Darya, Aksu, Tanhaz and the Yakkabag. The Kashkadarya river is fed from snow-glacier and snowfall and rainfall.[13] The river is heavily utilized for irrigation and domestic water uses, and as such it eventually diminishes in the Karshi Steppe without drain (see **Figure D.6**). A dam and reservoir is located approximately 20 km upstream of the Aksudarya river. The discharge rates from the dam are not known, however, coordination between the operators of the dam and the Contractor will be necessary during the construction phase to avoid any significant discharges of water impacting on construction activities around the bridge crossing the river.

Figure D.4: Kashkadarya River (km 113)

138. The road also crosses a number of canals and collectors, including:

Table D.2: Other Surface Water Courses in the Project Area

#	Km	Type
1	28+740	Canal
2	29+625	Collector
3	43+025	Pakhtaabad canal
4	45+857	Collector

[12] Environmental Performance Review – Uzbekistan. Second Review. UN, 2010
[13] Aral Sea Basin Program Water and Environmental Management Project – Component C – Dam Safety: Chimkurgan Dam Safety Assessment Report. March 2000. SMEC

5	55+375	Collector
6	61+390	Collector
7	69+150	Canal
8	71+326	Collector
9	73+625	Collector
10	98+656	Collector
11	103+825	Collector
12	108+345	Naukhat canal
13	115+985	Ankhor canal

Figure D.5: Aksudarya river (Km 106)

139. Samples of water quality were taken from the Kashkadarya river at Km 113 in June, 2016 by an independent monitoring consultant. A range of parameters were measured, none of which exceed the water quality standards of Uzbekistan (see **Appendix U** for a table of the results) which is interesting given the findings of the Environmental Performance Review findings mentioned above. It should be noted that, although requests were made for a range of parameters, the independent monitoring consultants failed to monitor turbidity (total suspended solids), or oil and grease. Prior to the start of construction the Contractor will undertake baseline water quality monitoring at the Kashkadarya and Aksudarya rivers. Oil and grease and suspended solids will be monitored to determine baseline levels against which any future changes will be assessed.

140. The estimated regional groundwater reserves in Uzbekistan make up 18,455 million m^3/year. The total actual extraction is 7,749 million m^3/year, which is about 42 % of the estimated reserves. Fresh groundwater is concentrated mainly in the Fergana Valley (34.5 %) and the regions of Tashkent (25.7 %), Samarkand (18 %), Surkhandarya (9 %) and Kashkadarya (5.5 %), with the rest being brackish or saline and having limited potential for use. Groundwater supplies are mainly used for domestic and drinking water supplies (173.5 m^3/s), irrigation and stock water development needs (70.5 m^3/s) and industrial and process water supplies (29.6 m^3/s).

141. Ground water in the Project area occurs within 1–5 m. Groundwater chemical composition is concrete corrosive – its sulphate content ranges from 144 to 12230 mg/kg. In addition, high sulphate and chloride levels in the groundwater lead to salinization.

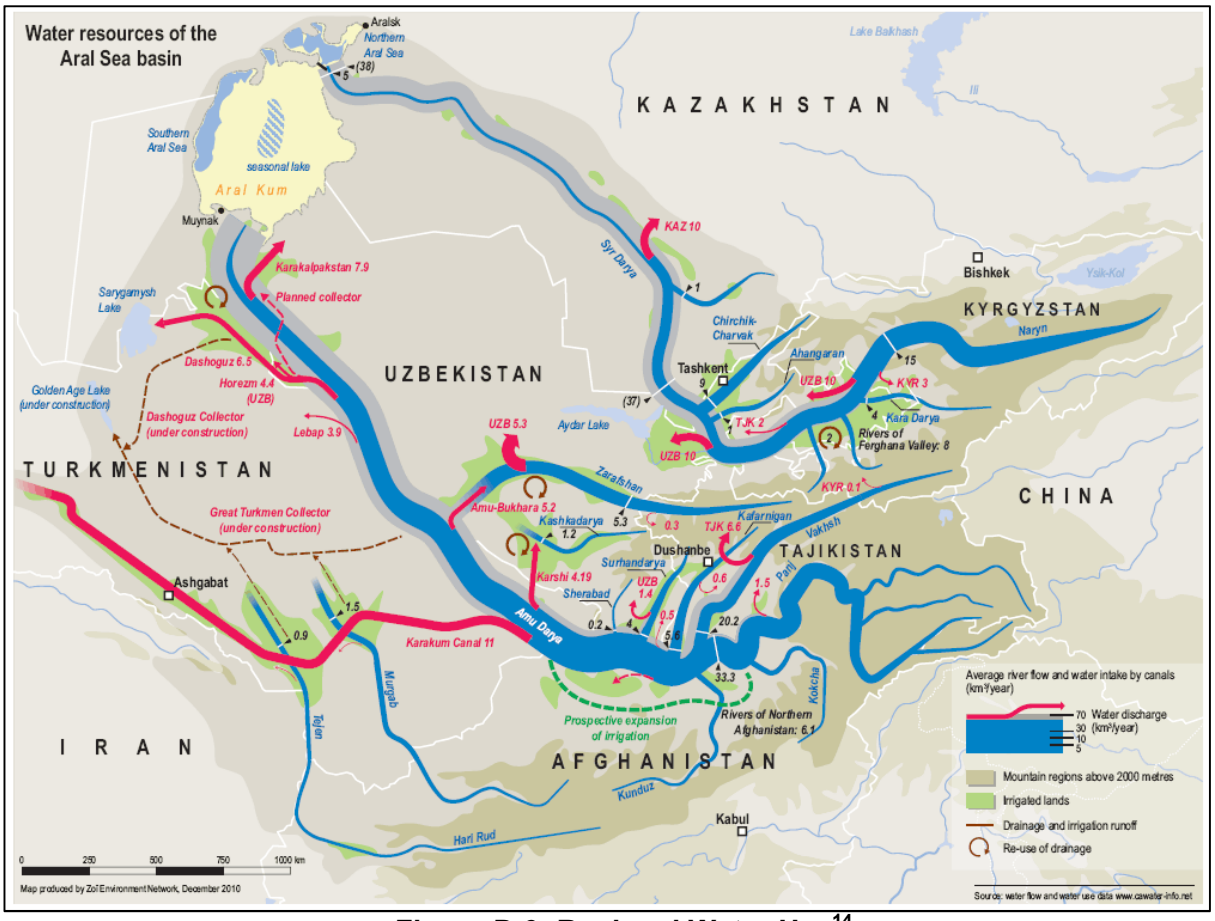


Figure D.6: Regional Water Use[14]

D.1.4 Soils & Geology

142. From geological aspect within the Project area there are quaternary rocks, which are presented as hard clay loams and fine sandy loam with inclusions of shingle, gravel, granitic subsoil, ballast and boulders, and also chalk deposits. In small rivers and ravines gravel and shingle, crushed stones and boulders occur. Also Neogen rocks occur which are represented by

[14] http://www.cawater-info.net/aral/i/vod-res-bam-e.gif

clays of red color with inclusions of rocks, gravel, granitic subsoil and boulders. As noted by **Section C – Project Description**, during the construction phase the main construction materials used will be gravel and sand excavated from borrow pits at Guzar, Tanhoz, Kitab and Kashkadarya located in Kashkadarya region. These sites have a total reserve of more than 380 million m^3. **Appendix Q** illustrates the approximate locations of the borrow pits.

143. Soils mapping by the FAO indicates that the soils in the Project area are generally salt free, but become slightly saline as the road gets closer to Karshi.[15]

D.2 Ecological Resources

144. Uzbekistan is located at the crossroads of several bio-geographical regions. It contains a variety of landscapes, including high mountain ranges, wetlands, and the infamous Aral Sea. Almost 85 % of Uzbekistan's territory is occupied by desert or semi desert, including the largest arid zones in Central Asia: the Kyzylkum, and the Ustyrt Plateau. About 10 % of Uzbekistan's land, most of it in the Fergana Valley, is classified as arable, and 0.8 % is planted to permanent agricultural crops. About 0.4 % is forested. Most of the rest is desert.

D.2.1 Flora

145. The flora of Uzbekistan is represented by at least 4,800 species of vascular plants which belong to 650 genera and 115 families. Endemism rate is rather low and equals 8 % (or 400 species) of the total number of species.[16]

146. The Project road traverses a mix of urban settlements, agricultural land and pastureland. Within these various pockets of land more than 48,000 trees can be found in the RoW that will need to be cut to allow the road to be widened to accommodate the specific design requirements. **Table C.7** indicates the numbers of trees to be cut in the specific portions of the Project road. The types of trees found within the Project corridor include Mulberry, Sycamore, Poplar, Pine, English Elm, Hazel, Almond, Apricot and Cherry.

D.2.2 Fauna

147. According to the 2008 Red List of Threatened Species of the IUCN, there are 52 critically endangered / endangered / vulnerable species in Uzbekistan. A further 415 species have a lower risk, and the data for five species are insufficient. Uzbekistan produced their national Red Book in 2006, which has a partial overlap with the 2008 International Red List, being more stringent in some instances. No IUCN Red List Species have been identified within the Project corridor and no land migration corridors exist within the Project area.

148. An Important Bird Area (IBA)[17] is situated 60-70 km north-east of Karshi town in Chimkurgan Reservoir (see **Figure D.7**). It belongs to the Kamashi and Chirakchi districts of

[15] http://www.fao.org/fileadmin/user_upload/GSP/docs/eurasian_workshop/Uzbekistan_Moscow_20.11.2013.pdf

[16] http://enrin.grida.no/htmls/uzbek/report/english/animal.htm

[17] An Important Bird and Biodiversity Area (IBA) is an area identified using an internationally agreed set of criteria as being globally important for the conservation of bird populations. The program was developed and sites are identified by BirdLife International.

Karshinskaya province. The reservoir is of the channel storage type and is located in the Kashkadarya river basin. The area of the reservoir is 44.4 km^2, with a length of 17.5 km, maximum width of 5.5 km, average depth of 17.2 m, and a maximum depth of 30 m. Its water is used for irrigation. Access to the reservoir is strictly controlled and permission is required to enter the site. **Table D.3** indicates the populations of IBA triggered species found at the site, the most important of which is the Lesser White-fronted Goose which is listed as 'vulnerable' by the IUCN Red Book.

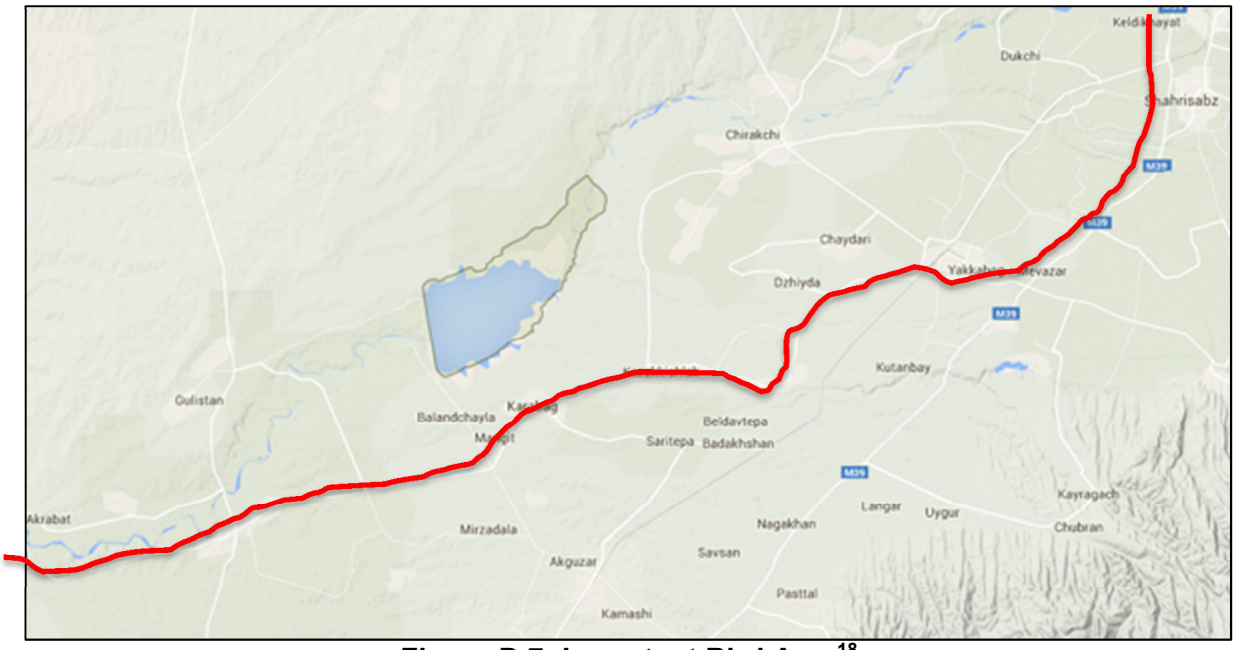


Figure D.7: Important Bird Area[18]

Table D-3: Populations of IBA Triggered Species[19]

Species	Season	Period	Population estimate	Quality of estimate	IBA Criteria	IUCN Category
Lesser White-fronted Goose Anser erythropus	winter	2007	7-18 individuals	medium	A1	Vulnerable
Greylag Goose Anser anser	winter	2007	323-12,868 individuals	good	A4i	Least Concern
Ruddy Shelduck Tadorna ferruginea	winter	2007	528-2,986 individuals	medium	A4i	Least Concern
Great Cormorant	winter	2007	108-4,640 individuals	medium	A4i	Least Concern

[18] http://www.birdlife.org/datazone/geomap.php?r=i&c=225
[19] http://www.birdlife.org/datazone/geomap.php?r=i&c=225

Phalacrocorax carbo						
Demoiselle Crane Anthropoides virgo	passage	2007	28-1,004 individuals	medium	A4i	Least Concern
Common Crane Grus grus	passage	2007	18-1,103 individuals	medium	A4i	Least Concern
A4iii Species group - waterbirds	winter	2007	3,091-20,825 individuals	good	A4iii	

D.2.3 Forests & Protected Areas

149. Uzbekistan's current protected natural areas fall into five categories: nature reserves/national reserves (zapovedniks); national parks; one ecological centre; wildlife areas (zakazniks); and national nature memorials.[20] The nearest protected areas include:

150. Kitab State geological nature reserve - situated in the south-western branches of the Zarafshan range (1300 msl. to 2650 msl). Flora includes more than 500 types. Fauna represents 21 types of mammals and 120 types of birds, including those which are listed to the Red Book of Uzbekistan. They are golden eagle, bearded vulture, booted eagle and others. The reserve is located more than 25 kilometers north-east of the Project road. **Figure D.8** indicates the locations of the reserve.

[20] Environmental Performance Review – Uzbekistan. Second Review. UN, 2010

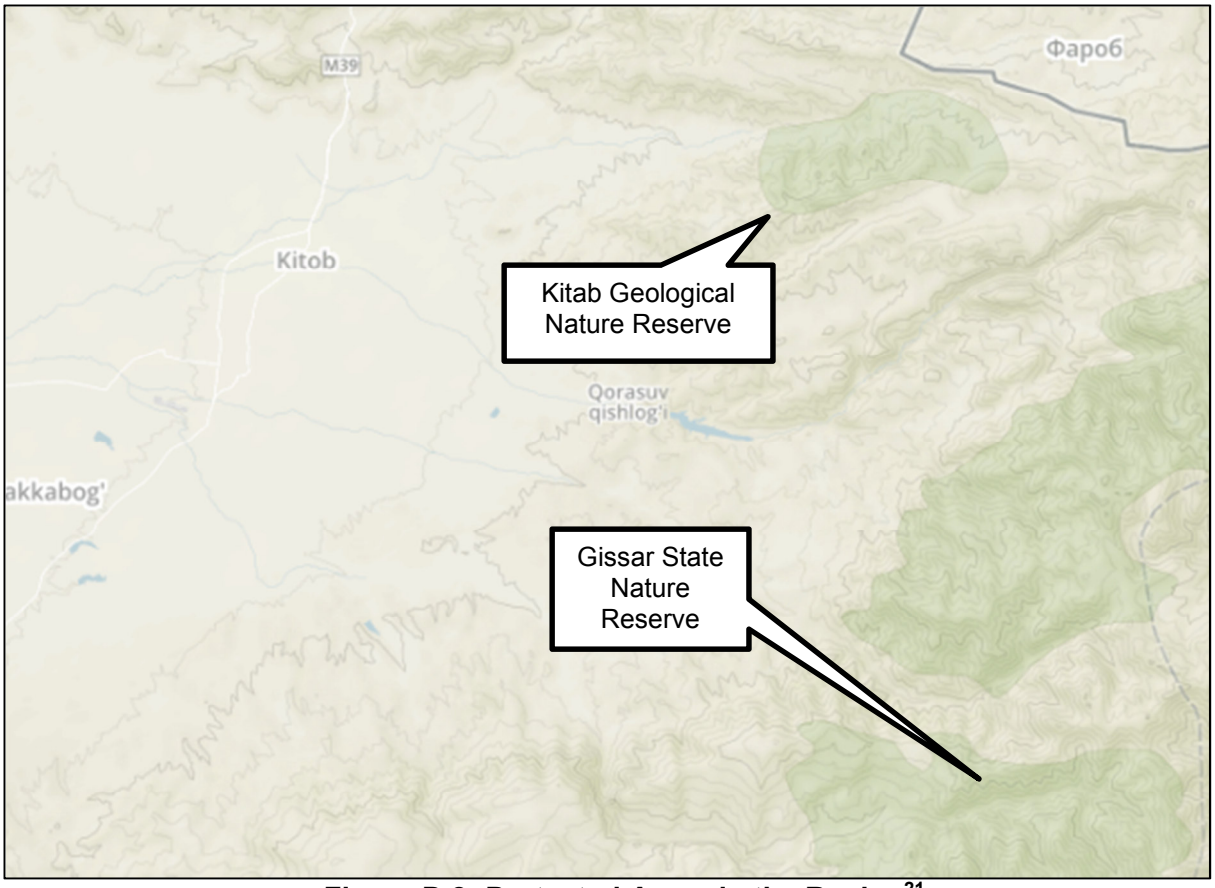


Figure D.8: Protected Areas in the Region[21]

151. The Gissar State Nature Reserve - situated on the western mountainsides of the Gissar range between 1,750 msl and 4,349 msl and was established in 1985 when two independent nature reserves were merged. The first of these was the Kizilsuyskiy Nature Reserve, founded in 1975 for the protection of one of the best extensive juniper forests in the Western Pamoro-Alay. The second was the Mirakinskiy Nature Reserve, founded in 1976 for the protection of the upper reaches and source of the Kashkadarya river and the Severtzov glacier (about 3.5 km long). The nature reserve is rich in natural features, including one of the largest caves in Central Asia – the Cave of Amir Temur – kuragoni in the southern part of the reserve, which is situated at more than 2,900 m. Mature juniper forests cover less than 10% of the site, while open juniper forests and elfin woods cover approximately 20 %. The flora of the Western Gissar is typical of the mountains of Central Asia. It is rather rich in species composition and there is a considerable number of endemics. The reserve is located more than 50 kilometers east of the Project road.

D.3 Economic Development

D.3.1 Industries & Agriculture

152. Economic production is concentrated in commodities. Uzbekistan has the fourth largest gold deposits in the world. The country mines 80 tons of gold annually, seventh in the world.

[21] http://www.protectedplanet.net/country/UZ

Uzbekistan's copper deposits rank tenth in the world and its uranium deposits twelfth. The country's uranium production ranks seventh globally. The Uzbek national gas company, Uzbekneftegas, ranks 11th in the world in natural gas production with an annual output of 60 to 70 billion cubic metres (2.1–2.5 trillion cubic feet). The country has significant untapped reserves of oil and gas: there are 194 deposits of hydrocarbons in Uzbekistan, including 98 condensate and natural gas deposits and 96 gas condensate deposits.

153. Along with many Commonwealth of Independent States or CIS economies, Uzbekistan's economy declined during the first years of transition and then recovered after 1995, as the cumulative effect of policy reforms began to be felt. However, since the mid-2000s, Uzbekistan has enjoyed robust GDP growth, thanks to favourable trade terms for its key export commodities like copper, gold, natural gas, cotton, the government's macro-economic management, and limited exposure to international financial markets that protected it from the economic downturn. Overall GDP growth for Uzbekistan has continued at around 8 % annually during 2011-15, supported by net exports and a large capital investment program.

154. Agriculture employs 26 % of Uzbekistan's labour force and contributes 18 % of its GDP (2012 data). Cultivable land is 4.4 million hectares, or about 10 % of Uzbekistan's total area.

155. The economy of the Kashkadarya Region and the Project area is focused on agriculture. The share of agricultural production in Kashkadarya in the gross regional product is more than 40 %. The gross agricultural output of the region is 796.1 billion soms. Kashkadarya is one of the main sources of grain, cotton and other agricultural products in Uzbekistan producing 10.2 % of all agricultural products (10 % of cotton, 11 % of grain). 98 % of gas and more than 80 % of oil extracted in Uzbekistan comes from Kashkadarya.[22]

D.3.2 Infrastructure and Transportation facilities

156. The villages within the Project corridor are served by mains electricity and mains gas and piped water systems. Many of the connecting utilities are located adjacent to the road sides, such as gas and water pipes. Careful consideration needs to be applied to these utilities during the design and construction phases of the Project to minimize disruption to these utilities, especially in winter months. Other infrastructure in the Project area includes irrigation channels. As with utilities, design and construction activities should be coordinated with users of irrigation waters to ensure minimal disruption.

157. Numerous access roads line the Project corridor. These access roads are important to the local population who use them to access villages, individual properties and farmland. As noted in the Project Description section of this IEE, the Project actually comprises four separate road sections, and as such it is important for access to remain open to the other portions of these sections from the Project road.

D.3.3 Land use

158. Land use mapping by the FAO (**Figure D.9**) concurs with the findings of the site visits, that the Project area is dominated by agricultural lands and pastureland.

[22] http://www.uzbekembassy.org/e/investment_guide_by_kashkadarya/

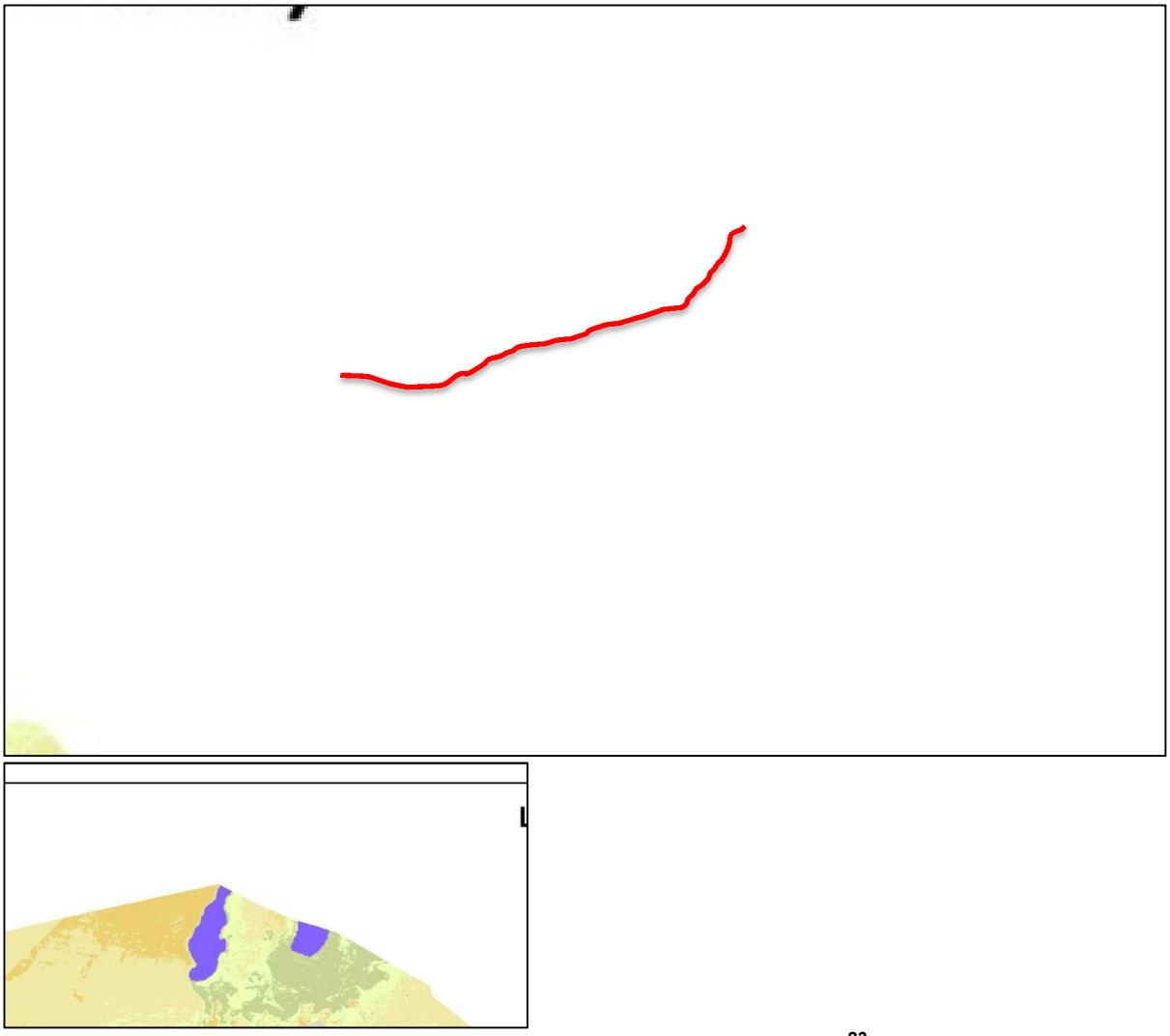


Figure D.9: Land Use in Kashkadarya [23]

The road also passes through several settlements, the most populous of which are Chim, Yakkabog, Shahrizabz and Kitab. No heavy industrial land uses were noted within the Project Corridor. Commercial and light industrial activities are within the more established settlements, such as Shahrizabz, but none of these activities were noted within the RoW. No buildings of architectural or historical importance were noted within the Project corridor. **Appendix A** provides a summary of the Projects environmental setting.

D.4 Social and Cultural Resources

D.4.1 Socio-economic conditions

Ethnic Groups

[23] http://www.fao.org/fileadmin/user_upload/GSP/docs/eurasian_workshop/Uzbekistan_Moscow_20.11.2013.pdf

159. Despite of the permanent emigration of ethnic minorities from Uzbekistan since the collapse of the Soviet Union, more than 130 nationalities still live in the country. The main ethnic groups are Uzbeks (79.2 %), Russian (4.1 %), Kazakhs (3.8 %), and Karakalpaks (2.2 %). **Table D.4** indicates the ethnic composition of Kashkadarya and its districts.

Table D.4: Ethnic Composition of Kashkadarya and its Districts[24]

Region / District	Uzbek	Tajik	Kazakh	Karakalpak	Other
Kashkadarya Region	97.7	2.2	0	0	0.1
Kasan District	100	0	0	0	0
Kamashi District	100	0	0	0	0
Yakkabog District	99.4	0	0	0	0.6
Chirokchi District	100	0	0	0	0
Shahrizabz District	97	3	0	0	0
Kitab District	89.7	10.3	0	0	0

Languages

160. By law, Uzbek is Uzbekistan's exclusive nation-wide state language. Government policy requires the use of Uzbek in all dealings with officials, in street signage, and in business and education. Russian is still spoken widely, however, and enjoys ambiguous legal status as “the language of interethnic communication." In the autonomous Karakalpakstan region, Karakalpak is a state language alongside Uzbek. In Samarkand, many people speak Tajik as their mother tongue. Within the Project area the main language is Uzbek.

Religion

161. Islam is by far the dominant religion in Uzbekistan, as Muslims constitute 90% of the population while 5% of the population follow Russian Orthodox Christianity, and 5% of the population follow other religions. 54% of Muslims are non-denominational Muslims, 18% are Sunnis and 1% are Shias.

Sensitive Receptors

162. Within the Project corridor a number of receptors sensitive to noise, vibration and air emissions have been identified **(Table D.5).**

Table D.5: Sensitive Receptors in the Project Corridor

#	Type	Location (km)	Approximate Distance from Centerline (m)
1	School in Chim	37.4	50 m
2	Clinic in Chim	38.7	>50 m
3	School in Chim	40.2	>50m
4	College	41.6	>50m
5	Cemetery	54	5 m

[24] Ethnic minorities development framework. Kashkadarya and Navoi rural water supply and sanitation sector project. ADB, 2005.

6	School	57.6	<50m
7	Cemetery	59.6	2m
8	School	60.0	>50m
9	School and Kindergarten	64.0	>50m
10	Cemetery	64	14m
11	College in Yangiobod	69.8	50 m
12	School in Esat	73.2	<25m
13	College in Yakkabog	82.2	50 m
14	School	84.9	>50m
15	School	95.8	>50m
16	Cemetery	103	>20m
17	School	107	>50m
18	School	119	50m
19	Cemetery	122	>20m
20	School	125	>100m

D.4.2 Health & Education facilities

163. Several schools, clinics and hospitals were noted within 200 meters of the centerline of the Project corridor. **Table D.5** lists the schools locations and distances from the centerline. These facilities were located both in urban and semi-rural locations where speed limits range from 70 to 120 kilometers per hour.

D.4.3 Physical and Cultural Resources

164. Consultations with the Ministry of cultural and sport affairs of the Republic of Uzbekistan (Main scientific agency of protection and use of cultural heritage objects, In Kashkadarya and Surkhandarya region) revealed that there are no cultural heritage sites within the vicinity of the ADB portions of the Project road. However, one site does exist at Km 22.5 on the GoU funded section of the road. **Appendix M** provides a translation of the letter from the Ministry confirming the location of the site.

165. Notwithstanding the above, numerous cemeteries are located within the Project area, but only three have been identified that may potentially be significantly impacted by the Project. The cemeteries are identified by **Table D.5**.

Figure D.11: Graveyard, km 59.6

166. Two other cemeteries were noted outside of the RoW, but close enough to potentially impacted be by project works during the construction phase at km103 and Km122 (see **Figure D.12**)

Figure D.12: Graveyard, km 122

D.4.4 Noise & Vibration

167. Noise is often explained as sound that is unwanted by the listener. Sound is a wave motion carried by air particles between the source and the receiver, usually the ear. Sound, pressure and noise are measured in units of decibel (dB) using a logarithmic scale. If a sound is increased by 10 dB, it is perceived as a doubling in loudness. Changes in a sound by 3 dB(A) is barely perceptible to the human ear. Noise standards in Uzbekistan and IFC noise standards are described in **Section B.3.3** above. Sensitive noise receptors[25] in the study area provided by **Table D.5** above.

168. Noise monitoring was undertaken by independent monitoring contractors in June, 2016 to assess the existing noise levels on the road in three settlements, Chim, Esat and Shahrizabz. The results (for full results see **Appendix V**) indicate that existing noise levels meet GoU and IFC standards for both day-time and night time noise.

Table D.6: Noise Levels

#	Place of monitoring	Period	Level of noise pressure / oscillating speed / in dB and octave bands with average nonmetric frequencies in hz				Accepted IFC/GoU sound level equivalent sound level, dBA
			63	250	1000	4000	
1	Chim village, km 37,4 of 4P79 road near the school №52 (left side)	Day time from 7am to 11pm	52	49	48	44	55
		Night time from 11pm to 7am	42	41	40	40	45
2	Esat village, at 73,2 km of the road near the school (right side)	Day time from 7am to 11pm	51	49	47	45	55
		Night time from 11pm to 7am	42	40	40	41	45
3	Shakhrisabz at km 1170 of м39 road near the market place	Day time from 7am to 11pm	54	50	55	54	60
		Night time from 11pm to 7am	52	51	53	51	60

169. Vibration monitoring was also undertaken by independent consultants as part of the IEE. The consultants stated that no significant levels of vibration were noted. Vibration is mainly an issue only during construction and as such no significant vibration issues are anticipated during the operational phase of the project.

[25] Sensitive noise receptors are classified as schools, hospitals, places of worship, etc.

E. Screening of Potential Environmental Impacts and Mitigation Measures

E.1 Introduction

170. This section of the IEE details the Projects potential impacts and proposes mitigation measures to limit any negative impacts identified. The first items discuss the types and phases of the impacts. The report then presents the impacts and mitigation in detail for the three portions of the Project in the subsections as follows:

(i) Physical Resources
- Air quality & Climate Change
- Topography
- Soils
- Hydrology – Groundwater
- Hydrology – Surface water
- Geology & Sesmicity

(ii) Ecological Resources
- Flora
- Fauna
- Forests & Protected areas

(iii) Economic Development
- Industries
- Infrastructure & Transportation Facilities
- Land use
- Waste Management
- Construction Camps and Batching Plants
- Borrow Pits

(iv) Social and Cultural Resources
- Community Health and safety
- Occupational Health and Safety
- Physical and Cultural Resources
- Noise

(v) Cumulative Impacts
(vi) Compliance Impacts
(vii) Impacts Associated with GoU Road Sections

E.2 Impact Phases

171. This impact assessment and mitigating measures cover the entire cycle of the project activities, from pre-construction to construction and operation and maintenance. The coverage of each of this sub-project phases is defined as follows:

(i) Feasibility / Design Phase, or the Pre-construction Phase
(ii) Construction Phase
(iii) Operation Phase

E.3 Types of Impacts

172. The types of impacts that may arise during Project works can be classified as follows:

(i) Direct Impacts - i.e., those directly due to the Project itself such as the impacts to air quality resulting from construction activities, equipment and vehicles. Direct impacts also include the impact of construction expenditures in the local economy.
(ii) Indirect Impacts - i.e., those resulting from activities prompted by the Project, but not directly attributable to it. The use of rock and other construction materials, for example, has an indirect impact of increasing the demand for these materials.
(iii) Cumulative Impacts - i.e., impacts in conjunction with other activities. A single road improvement may not exert a significant environmental impact, but if several roads are developed in the same area developing a road network the cumulative or additive effect could be more significant.
(iv) Compliance Impacts – i.e. impacts that would occur if correct compliance mechanisms are not enforced.

173. Impacts in all of these categories may be either:
(i) Short-term – i.e., impacts which occur during construction and affect land use, air quality and other factors. Many of these impacts, however, will be short-lived and without long-lasting effects. Even the effects of some relatively significant impacts such as borrow pits, for example, may be eventually erased if appropriate mitigation actions are taken. Many potential short-term negative impacts can be avoided or otherwise mitigated through proper engineering designs and by requiring Contractors to apply environmentally appropriate construction methods. Or;
(ii) Long-term – i.e., construction impacts that could, for example, affect regional hydrology and flooding if poor design practices are used.

174. Both short-term and long-term impacts may be either beneficial or adverse. Short-term positive impacts will include, for example, the generation of employment opportunities during construction period. Long-term benefits will include enhanced development opportunities, improved transport services, easier access to commercial and service facilities; faster communications and commodity transport; improved access to markets and growth centers and increased services and commercial facilities.

E.4 Mitigation Aspects

175. Mitigation is recommended through strategic avoidance combined with construction and monitoring. Bid and contract documents are recommended to specify that a Site Specific EMP (SSEMP) shall be required for both road Projects. The Contractor shall ensure that the SSEMP is submitted to the Engineer for review at least 10 days before taking possession of any work site. No access to the site will be allowed until the SSEMP is reviewed and approved by the Engineer and EA.

E.5 Summary of Impacts

176. **Table E.1** provides a summary of the potential Project impacts that are discussed in detail under **Sections E.6** to **E.8**.

Table E.1: Summary Impact Table

cal Characteristic						Biological Characteristic			Socio-economic Characteristic									
	Topography	Soils	Climate and Air Quality	Hydrology	Natural Hazards	Flora	Fauna	Protected Areas	Infrastructure	Land Use	Waste Management	Population	Community Structure	Socio-economic	Public Health & Safety	Educational Facilities	Cultural Heritage	Noise
										D/L				D\L				
	D/L	D/L	D/L			D/L									D/L			D/L
		D/L	D/L	D/S		D/S					D/L				D/L			D/L
		D/L	D/L	D/S		D/S					D/L			D/L	D/L			D/L
		D/L	D/L	D/S		D/S					D/L				D/L			D/L
		D/L	D/L						D/L						D/L	D/L		D/L
		D/L		D/L		D/L	D/L			D/L	D/S							D/S
	D/S	D/S	D/S	D/S		D/S			D/S		D/S				D/S	D/S		D/S
		D/S	D/S	D/L		D/L	D/L				D/S				D/S			D/S
		D/S	D/S	D/L			D/S				D/S				D/S			D/S
	D/L	D/S	D/S	D/S		D/S	D/S		D/S	D/S	D/S				D/S			D/S
		D/L		D/L		D/L	D/L			D/L				D/S				
									D/L	D/L		D/L	D/L	D/L				
			D/L											D/L	D/L	D/L		D/L

Short-term Impact	L= Long term Impact		Potential Positive Impact		Potential Low/Medium Impact		Potential High Impact

E.6 Physical Resources

E.6.1 Air quality & Climate Change

Potential Air Quality Impacts

177. The potential impacts of the Project to air quality and climate change are described as follows:

Construction Phase

178. During construction of the road, air quality is likely to be degraded by a range of operational activities including:

(i) Exhaust emissions from the operation of construction machinery (e.g. Nitrogen Oxides (NOx), Sulphur Oxides (Sox) and Carbon Monoxide (CO));
(ii) Open burning of waste materials; and
(iii) Dust (Particulate Matter (PM)) generated from quarries, borrow pits, haul roads, unpaved roads, exposed soils and material stock-piles.

179. However, the road rehabilitation works associated with the Project are generally intermittent and not permanent in a specific site, the works move along the Project road as work progresses and as such air quality impacts will be short term in specific locations. Fugitive emissions will be emitted on a longer-term basis from stationary sources such as quarries, borrow pits, concrete batching plants and rock crushing plant. These sites can however be selected and be placed in an area where it can cause the least impact on human and ecologic receptors.

Operational Phase

180. An increase in traffic levels during the operational phase will lead to an increase in the levels of vehicular emissions, such as SO_X, NO_X and CO. However, the recent air quality monitoring activity did not indicate that these parameters were even present at the monitoring locations, with dust being the only parameter recorded.

181. Generally, during dry periods dust can build up on roads and the movement of vehicles, especially heavy goods vehicles, can kick up dust plumes which can result in the types of impacts indicated above. However, it should be noted that naturally dusty conditions do occur in the Project area, especially during the summer months.

Potential Climate Change Issues

182. Even though traffic will increase on the Project road, vehicle emissions are unlikely to contribute in any significant way to regional or global greenhouse gas levels. The potential risks to the project from climate change includes the following:

(1) Change in Temperature:
   a. Potential corrosion of steel reinforcements in concrete structures due to increase in surface salt levels in some locations resulting from increased evaporation due to increased temperatures.

b. Potential for reduced pavement deterioration from less exposure to freezing, snow, and ice. Warmer winters could result in reductions in snow and ice removal costs, extend the construction season and improve the mobility/safety of passenger and freight.
c. Cement Concrete Pavement Joint Issues - Bitumen can be pressed out of road joints during the hot summer days owing to expansion of the cement concrete pavement and the resulting compression of the joints. Once displaced, this bitumen can overflow on to the surface. In the cold winter season, the cement concrete pavement can shrink, resulting in dilation of the joints, which do not have sufficient bitumen left inside. This results in an accumulation of water, which freezes at night. The ice expands inside the joint, causing lateral stress on the adjoining pavement, leading to cracking of the pavement surface.[26]

(2) Change in precipitation levels:

d. Potential damage to roads and drainage systems due to flooding - more frequent as well as intense and heavy precipitation events can cause immediate damages, undermine road structural integrity, affect the maintenance of roads, bridges and drainage systems.
e. Increases in heavy precipitation events/floods may cause more weather-related accidents due to vehicle and road damages and poor visibility, delays, and traffic disruptions. However, embankments heights are being reduced to limit fatalities and serious injuries caused when vehicles roll off the road.
f. Increase in scouring of roads, bridges, and support structures.

Mitigation Actions

Pre-construction Phase

183. To adequately manage air quality impacts, the Contractor shall be responsible for the preparation of an Air Quality Plan. The plan will detail the action to be taken to minimize dust generation (e.g. spraying un-surfaced roads with water, covering stock-piles, etc.) and will identify the type, age and standard of equipment to be used and will also provide details of the air quality monitoring program for baseline and routine monitoring. The Plan shall also include contingencies for the accidental release of toxic air pollutants (or shall make reference to the Emergency Response Plan).

184. In addition to the above plan, the following assessments associated with potential climate changes should be undertaken by the designers during the design stage of the Project:

(i) *Corrosion of steel reinforcements in concrete structures* – Assess if the use of Advanced concrete materials and structures will help improve the durability of concrete infrastructure and their adaptation to climate change.
(ii) *Damage to roads and drainage systems due to flooding* – Assessment of 1/50 year flood return period for all bridges. Increase capacity of side and cross drains to accommodate more intense floods.

[26] Climate Proofing ADB Investment in the Transport Sector. ADB, 2014.

(iii) *Increase in scouring of roads, bridges, and support structures* – Assess designs of piers, abutments and embankments to determine if protection methods (e.g. rip-rap) are required to cope with additional water volumes and increased flow intensity.

(iv) *Cement Concrete Pavement Joints* - To improve the resilience of the joints, the project should consider adopting plastic joint profiles made of ethylene-propylene-diene monomer rubber (EPDM).

Construction Phase

185. To limit air pollution during the construction phase the Contractor will take measures to ensure the following conditions are met:

(i) *Exhaust emissions* - No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the Engineer. Construction equipment shall be maintained to a good standard and fitted with pollution control devices regularly monitored by the Contractor and Engineer.

(ii) *Open burning of waste materials* - No burning of debris or other materials will occur on the Site without permission of the Engineer.

(iii) *Dust generated from haul roads, unpaved roads, material stock piles, etc.* - The Contractor shall ensure and that material stockpiles shall be located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne. All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s). Hard surfaces will be required in construction areas with regular movements of vehicles. Effective use of water sprays will be implemented (e.g., all roads within the construction areas of the Site shall be sprayed at least twice each day, and more if necessary to control dust to the satisfaction of the Engineer).

186. Locations for quarry sites, borrow pits, rock-crushing and concrete batching plants shall require approval from the Engineer and the PMU during the Construction phase. Efforts should be made to ensure that these facilities are as near to the Project road as practical to avoid unnecessary journeys and potential dust issues from vehicle movements during construction works.

187. No quarry, rock crushing plant or concrete batching plant shall be located within one kilometer of any urban area or sensitive receptor. The locations of these facilities shall be indicated within the Contractors SSEMP. Baseline air quality monitoring shall also be undertaken by the Contractor as described by the EMP.

Operational Phase

188. During the operational phase of the Project it is recommended that the PMU undertake annual air quality monitoring at Chim, Esat and Shahrizabz to determine if dust levels generated from vehicle movements on the Project road are within the limits set by the GoU.

E.6.2 Topography

Potential Impacts

Pre-construction Phase

189. The Project location in this instance has been determined by the existing RoW to be rehabilitated. No significant alteration in realignment is included in the Project and all works will occur within the RoW and no impacts to topography are anticipated.

Construction Phase

190. Sand and gravel will be sourced from riverbeds and existing borrow pits. As such no impacts to topography are anticipated during the construction phase.

Mitigation Actions

None warranted.

E.6.3 Soils

Potential Impacts

Construction Phase

191. The decision to restrict the Project road to within the existing RoW and carriageway will keep soils related construction impacts to a minimum. Potential impacts to this component may however include:

(i) Contamination Due to Spills or Hazardous Materials - Potential soil contamination is a possibility resulting from poorly managed fuels, oils and other hazardous liquids used during the project works.
(ii) Erosion – It is possible, that without adequate protection measures soil erosion could occur on road embankments and bridge embankments. It is also possible, that stockpiles of soil located close to surface waters could infiltrate the water courses during heavy rainfall and cause siltation of the rivers.
(iii) Topsoil – Several impacts to topsoil may occur during the construction phase, including; removal of top soil for construction outside the RoW; compaction of topsoil; loss of top soil by wind and water erosion and covering of top soil by project works.

Mitigation Actions

Construction Phase

192. Mitigation related to the potential soil-related impacts is recommended as follows:

(i) Erosion - During construction, the Contractor will be responsible for

ensuing material that is less susceptible to erosion will be selected for placement around bridges and culverts. In addition he shall ensure re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local grasses and shrubs; (ii) immediate re-vegetation of all slopes and embankments; (iii) placement of fiber mats to encourage vegetation growth. The Engineer and the Contractor will both be responsible for ensuing that embankments are monitored continuously during construction for signs of erosion.

(ii) Topsoil – To reduce impacts to topsoil the following measures should be employed by the Contractor; locate topsoil stockpiles outside drainage lines and protect stockpiles from erosion; construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil; rip ground surface prior to the spreading of topsoil; limit equipment and vehicular movements to within the construction zones; remove unwanted materials from topsoil such as roots of trees, rubble and waste etc.

(iii) Conversion of Agricultural Soils Due to Indirect/Induced Impacts. Although the EMP contains provisions controlling direct impacts of land takings for both the road and ancillary functions (batching plants, construction camps, etc.), control of the induced impacts is largely beyond the scope of the Project.

(iv) Contamination Due to Spills or Hazardous Materials. The Contractor, with oversight from the Engineer, shall ensure that:

- All fuel and chemical storage (if any) shall be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tank (or one tank if more than one tank is located in the bund).
- The construction camp maintenance yard shall be constructed on impervious hardstanding with adequate drainage to collect spills, there shall be no vehicle maintenance activities on open ground.
- Filling and refueling shall be strictly controlled and subject to formal procedures. Drip pans shall be placed under all filling and fueling areas. Waste oils shall be stored and disposed of by a licensed contractor.
- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.
- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any soils.
- No bitumen drums or containers, full or used, shall be stored on open ground. They shall only be stored on impervious hardstanding.
- Areas using bitumen shall be constructed on impervious hardstanding to prevent seepage of oils into the soils.

E.6.4 Hydrology – Surface Water

Potential Impacts

Construction Phase

193. Potential impacts to surface water in the construction phase can be summarized as follows:

(i) Bridge Construction - Bridge construction activities may increase silt load in the river during construction at bridge sites and may result in accidental spillage of concrete and liquid waste into the river. This may impact upon the ecology of rivers including fish species.
(ii) Discharge from Dam and Reservoir - A dam and reservoir are located approximately 20 km upstream of the Aksudarya river. Large releases of water from the dam could impact upon the construction works at the bridge site if they are not coordinated with the Contractor.

Operational Phase

194. Drainage of run-off from the re-habilitated bridge decks could flow directly to the rivers and canals if correct drainage is not installed on the bridges. This could be a problem if the bridges have accumulated oils and grease during dry periods and they are suddenly washed out during heavy rainfall.

Mitigation Actions

Design Phase

195. All new bridges shall be designed for the life expectancy of 75 years. The bridge rehabilitation and strengthening works shall be designed for the life expectancy of 50 years. The design loading and design of all structural components must conform to the bridge design standards provided in the Employer's Special Requirements. Bridge designs should ensure that drainage from bridge decks over 50 meters does not discharge directly to the watercourses beneath the bridges. If possible the discharge waters should lead to a filter pond adjacent to the bridge in order to trap oil and grease run-off. Finally, the bridge design and layout must be aesthetically pleasing and in harmony with the existing environment.

196. It is assumed that the TDI have taken into account hydrological issues during the design phase to prevent flooding due to improper siting of drainage structures.

Construction Phase

197. Potential adverse impacts in the Project Area will be avoided or otherwise mitigated by ensuring the Contractor complies with the following:

(i) Water Use - The Contractor shall ensure that all required permits have been gathered prior to the excavation of any borehole.
(ii) Discharge from Dam and Reservoir - The discharge periods and rates from the dam upstream of the Aksudarya bridge are not known, however, coordination between the operators of the dam and the Contractor will be necessary to avoid any significant discharges of water impacting on construction activities around the bridge over the river.
(iii) Bridge Construction - The Contractor shall consult with Goskompriroda to establish the fish spawning period in relation to the bridge construction works crossing the Aksudarya and Kashkadarya rivers. The Contractor

shall ensure that all works are undertaken in periods least likely to affect the fish spawning period. In addition, concerning bridge construction works, the Contractor shall:

(a) Divert the water flow near the bridge piers.
(b) Provide coffer dams, silt fences, sediment barriers or other devices to prevent migration of silt during construction within streams.
(c) Perform dewatering and cleaning of cofferdams to prevent siltation by pumping from cofferdams to a settling basin or a containment unit.
(d) Carry out bridge construction works without interrupting the traffic on the Project Road.
(e) Ensure no waste materials are dumped in the river, including re-enforced concrete debris.

E.6.5 Hydrology – Groundwater

Potential Impacts

Construction Phase

198. From the construction activities, there will be significant use of fuel and lubricant. Without a standardized materials handling and storage protocol in place, spills and contamination of nearby waters through surface runoff is likely. Other impacts to groundwater could occur from the washing out of concrete mixers onto bare soils, lack of oil and grease interceptor tanks in drainage systems.

Mitigation Actions

199. The mitigation measures outlined in **Section E.6.4**, Hydrology – Surface water, should prevent impacts to groundwater as well as surface water. For example, the conditions relating to accidental spills will also prevent impacts to groundwater (and also to soils). Regarding extraction of groundwater; it is unlikely that groundwater will be required for construction activities. However, if boreholes are required, the Contractor will be responsible for obtaining all necessary permits for the drilling and operating of a borehole during the construction period. The Engineer will ensure that all appropriate permits are in place before excavation of boreholes can begin.

E.6.6 Geology & Seismicity

Potential Impacts

200. The project is located in a seismically active area. The TDI have experience of designing roads in this region and have ensured that all designs are compliant with the relevant seismic standards (KMK 2.01.03-96).

Mitigation Actions

201. None warranted.

E.7 Ecological Resources

E.7.1 Flora

Potential Impacts

202. The most significant impact to flora will be the cutting of more than 48,000 trees as part of the Project (**Table C.4** indicated the numbers of trees to be cut in the ADB sections of the Project road). None of the trees that will be cut are considered special status, and they do not provide habitat for any special status fauna, but they do have value from an aesthetic point of view.

Mitigation Actions

203. According to the EA, all trees have been cut in the GoU sections of the Project road. No tree cutting has started in the ADB portions of the road. Discussions with Goskompriroda and the EA were undertaken to establish the process for tree cutting within the Project area and any actions to date. The following summarizes the findings of the process and current activities:

(i) A survey is completed outlining the number of trees to be cut in the various sections of the road (the survey has been completed – see **Table C.4**).
(ii) Based on the number, types and age of trees to be cut, the RFF will be responsible for paying compensation direct to Goskompriroda (the RFF has, to date, paid US$ 3m for all portions of the Project road, including the ADB sections).
(iii) Trees can only be cut once compensation has been paid to Goskompriroda.
(iv) The TDI, with the aid of an in-house ecologist, will determine as part of the road design if any trees should be replanted during the construction phase of the Project and also what types of trees should be replanted and where. As part of the projects feasibility study a detailed tree planting program has been prepared (see **Appendix R**). The Contractor will be responsible for ensuring this plan is followed correctly, including the requirements for tree planting and tree maintenance during the construction phase and defects liability period.
(v) The RFF will be responsible for paying for the replacement trees as part of the Project costs. The current estimate for the tree planting program is approximately US$ 700,000.
(vi) The Contractor will be responsible for replanting any trees based on the requirements of the TDI design.
(vii) The local Khokimyat will be responsible for maintaining the trees after the defects liability period. The costs for maintenance by the Khokimyat are not currently known.

204. The local Khokimyat will be responsible for periodic monitoring of the trees during the construction phase to ensure that they are being maintained by the Contractor.

E.7.2 Fauna

Potential Impacts

205. Consideration has been given to potential direct impact to fauna in the Project corridor due to:

(i) Habitat Loss - Improvements will occur within the existing RoW with little loss of habitat. Borrow pits and quarries used will either be operational or require the approval of the Engineer and the EA and as such impacts to habitat will have either been mitigated or will require mitigation as part of any approval process. An IBA has been identified and is located approximately 3.2 km north of the Project road which means that this habitat is unlikely to be impacted directly by Project activities during both the construction and operational phases of the Project (e.g. by elevated noise levels). Rehabilitation of the road is unlikely to lead to a sudden increase in people visiting this site, or poaching of birds as access to this site is controlled and permission is required from local authorities before visits can be made to this site.

(ii) Habitat Fragmentation - Habitat fragmentation occurs when a road cuts through an ecosystem, fragmenting an area into weaker ecological sub-units, thus making the whole more vulnerable to invasion and degradation. In this instance, the fact that; a) proposed construction actions will occur within areas already devoted to transport, and b) all improvement activities will be contained within the existing RoWs minimizes any potential for further habitat fragmentation.

(iii) Rare and Endangered Species – None identified within the Project area.

Mitigation Actions

206. No construction camp, or construction facility, such as a concrete batching plant, shall be constructed within 5 km of the IBA.

E.7.3 Forests and Protected areas

Potential Impacts

207. No protected areas are within 25 km of the Project area.

Mitigation Actions

208. None required.

E.8 Economic Development

E.8.1 Infrastructure & Transportation Facilities

Potential Impacts

Transportation

209. The main impacts resulting from Project works will be road diversions and some temporary blocking of access routes. **Table C.7** and **Table C.8** indicate the number and types of vehicles that will be required during the construction phase. Road closure may occur for periods between one and two hours and as such is not a significant issue as long as the local population are given notice of the delays. Blocking of access routes will be temporary while structures, such as side drains and culverts, are constructed. Notwithstanding the above, the potential beneficial impacts to transport are significant. The road, when complete, will offer reduced travel times, smoother ride (resulting in less vehicle maintenance and less damage to perishable goods) and safer driving conditions.

Infrastructure & Utilities

210. Medium and low voltage power lines, water supply and gas pipes are located within the Project corridor. It is possible that these utilities will need to be temporarily removed during construction.

Mitigation Actions

Transportation

211. To mitigate the potential impacts the Contractor should:

(i) Submit a Traffic Management Plan to local traffic authorities prior to mobilization and include the plan as part of his SSEMP;
(ii) Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions;
(iii) Allow for adequate traffic flow around construction areas;
(iv) Provide adequate signalization, appropriate lighting, well-designed traffic safety signs, barriers and flag persons for traffic control; and
(v) Provide temporary access where accessibility is temporarily restricted due to civil works.

212. Access roads should be maintained during the construction phase and rehabilitated at the end of construction by the contractor to the satisfaction of the local authorities and in compliance with the contract. Compliance shall be monitored by the Engineer throughout the construction period.

Utilities

213. During construction all utilities in the Project Corridor shall be kept operational, particularly during the winter months. Facilities may require temporary relocation during the construction phase and as such the Contractor will be responsible for liaising with the relevant utilities operators to ensure they remain operational. Should utilities need relocating in a different location the Contractor will consult with the relevant utilities and local community to ensure that there is no change in supply as a result of these changes.

E.8.2 Land use

Potential Impacts

Pre-construction Phase

214. As the road involves reconstruction and rehabilitation of an established road, the Project impact on the land acquisition is reduced to a minimum. However, land acquisition and resettlement will still be required under the project.

Mitigation Actions

Pre-construction Phase

215. Under the terms of the agreement with the ADB, before the commencement of the construction works at any part of the Project, the Employer must prepare the Land Acquisition and Resettlement Plan (the LARP), obtain the approval of ADB and then implement the plan and acquire the land. The LARP will be processed by the Employer and ADB during the bidding period, and it does not require any action of the Contractor. It will be approved and implemented before the Commencement Date. Under the terms of the agreement with the ADB, the Employer must notify all persons affected by land acquisition, approximately one month before the commencement of works on the acquired land. The notice is required to give these persons sufficient time to remove their belongings and to salvage the material from any structure.

E.8.3 Waste Management

Potential Impacts

216. Road construction will inevitably generate solid and liquid waste products potentially including:

(i) Inert waste – for example, concrete, wood and plastics.
(ii) Hazardous waste – acids and alkaline solutions, waste oils and oily sludge, batteries, asbestos, and bitumen.

217. In addition, uncontrolled discharges of sewage and 'grey water' (e.g. from washrooms and canteens) from construction sites and worker's camps may also cause odors and pollute local water resources. As well as being a cause of complaints by the local population, this may lead to contravention of local regulations and fines being imposed on the Contractor.

218. The main construction waste produced will be Asphalt and waste concrete (solid and sludge). **Table E-2** indicates the main types of waste and an estimate of volumes

Table E-2: Waste Types and Estimated Volumes

#	Waste Type	Hazardous	Estimated Volume
1	Concrete	No	200 m^3
2	Asphalt	No	100,000 m^3
3	Bituminous Mixtures	Yes	1 t

4	Wood	No	1 t
5	Uncontaminated Metal	No	5 t
6	Uncontaminated Plastic	No	1 t
7	Contaminated metal (paint tins, etc.)	Yes	2 t
8	Contaminated plastic (oil containers)	Yes	3 t
9	Domestic waste (food stuffs)	No	5 t
10	Domestic Waste (non-foodstuff)	No	40 t
11	Sewage Water	Yes	150 m^3
12	Tyres	Yes	150 t
13	Hazardous liquid waste	Yes	20 m^3
14	Hazardous solid waste	Yes	10 t
15	Asbestos	Yes	50 m^3

Mitigation Actions

219. To ensure waste management is adequately controlled, the Contractor shall be responsible for a range of measures including:

1. Waste Management Plan - The Plan shall include items relating to the safe handling and management of:

(i) Domestic waste
(ii) Food waste
(iii) Recycled Waste (including Asphalt)
(iv) Plastic
(v) Metals
(vi) Wood
(vii) Construction Waste
(viii) Hazardous Waste (including asbestos)
(ix) Liquid Waste

220. Oversight of the implementation of the Plan is the responsibility of the Engineer as outlined in the EMP.

(i) Asbestos Management - As noted by **Table E-2**, a large quantity of asbestos waste (from water pipes) will be generated as part of the project works. Given the large quantity of this waste and the potential health impacts that may arise from the handling and disposal of asbestos, it is recommended that the Contractor prepares a separate method statement for the safe excavation, handling and disposal of the waste material. The method statement should be reviewed and approved by the Engineer before excavation of these pipes begins.

(ii) Recycling and Reuse - Where possible, surplus materials will be reused or recycled – this should include asphalt, concrete, wood, plastic, metal and glass. A plan for the recycling of materials should be included in the waste management plan.

(iii) Storage of Hazardous Wastes - Oils, fuels and chemicals (including bitumen, bridge deck waterproofing agents and concrete) are substances which are hazardous to human health. They need to be stored properly in

correctly labeled containers, both within the construction camp and also at construction sites (e.g. bridges, culverts, etc.). Bitumen, oil and fuel should be stored in tanks with lined bunds to contain spillage (the bund should be able to contain at least 110% of the volume of the largest storage tank within the bund).

(iv) Waste Disposal – Waste, both hazardous and non-hazardous, shall be collected and disposed of by a licensed waste management contractor. The Contractor will keep copies of the waste management company's licenses on file at his site office. The Contractor shall also keep a record of the waste volumes and types removed from the site and the waste transfer notes provided by the waste management contractor.

(v) Asphalt - Waste asphalt will be recycled where possible by the Contractor. Around 100,000 cubic meters of asphalt will be removed from the pavement and will be recycled for base material and shoulder material.

(vi) Concrete - Waste concrete and reinforced concrete will also require disposal. Waste concrete should be crushed and re-used as fill material, or base material where possible. Under no circumstances should concrete mixers be washed out onto open ground at construction sites, such as bridges – this issue is discussed further under item E.6.4 – Hydrology.

(vii) Liquid Waste - The issue of liquid waste, including concrete sludge, camp run-off water, vehicle washing water, batching plant wastewater, etc., is discussed above under item **E.6.4 – Hydrology** and **E.8.4 Construction Camps**

E.8.4 Construction Camps & Batching Plants

Potential Impacts

221. Construction camps constitute a temporary land use change and raise issues related to activities such as impacts to air quality; poor sanitation arrangement and improper methods used for disposal of solid wastes and effluent; and transmission of communicable diseases to the local people by the construction workers due to inappropriate health monitoring facilities. Specific issues may arise as a result of the following:

(i) Design and Siting - Improper siting and design of construction camps can have negative impacts to hydrology through inappropriate disposal of liquid waste and spills of hazardous liquids. Poor management of sanitary waste and accidental spills of hazardous liquids from construction camps can also have negative impacts on ground and surface water. Rock crushing plants and concrete batching plants can also have impacts on sensitive receptors located downwind of the sites if the plants are too close to the urban areas.

(ii) Concrete Batching Plants - Potential pollutants in batching plant wastewater include cement, sand, aggregates and petroleum products. The main sources of wastewater at batching plants are; contaminated storm water runoff, dust control sprinklers, the agitator washout station, the agitator charging station, the slumping station, and cleaning and washing areas. These substances can adversely affect the environment by:

- increasing water pH
- increasing the turbidity of waterways (turbidity is a measure of the cloudiness of a suspension).

Mitigation Actions

Construction Camps – In the first instance, no construction camp shall be located within one kilometer of an urban area and at least 50 meters from any surface water course, this will help reduce noise, water and air quality impacts. The Engineer shall approve the locations of the Contractors camps prior to the establishment of the camp, In addition, the Contractor shall be responsible for the preparation of a Construction Camp Site Plan which will form part of the SSEMP. The Plan shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. The Contractor shall ensure the following conditions are met within the Plan:

(i) Rain-water run-off arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance. The drainage system should be fitted with oil and grease interceptors.

(ii) There shall be no direct discharge of sanitary or wash water to surface water. Septic tanks shall be provided at construction camps for sewage water. Licensed contractors will be required to collect and disposal of liquid waste from the septic tanks on regular basis.

(iii) Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited.

(iv) Liquid material storage containment areas shall not drain directly to surface water.

(v) Waste water from vehicle washing bays should be free of pollutants if the wash bay has been constructed correctly. **Appendix P** provides a schematic of a vehicle washing bay that should be considered by the Contractor.

(vi) Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up materials shall be maintained at the storage area.

(vii) Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters and are connected to septic tanks, or waste water treatment facilities.

(viii) Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.

(ix) Washing out concrete trucks at construction sites shall be prohibited unless specific concrete washout areas are provided for this purpose at

the construction site (e.g. a bridge site). The washouts should be impermeable and emptied when 75% full.

(x) Spill clean up equipment will be maintained on site (including at the site maintenance yard and vehicle fueling areas). The following conditions to avoid adverse impacts due to improper fuel and chemical storage:
   (a) Fueling operations shall occur only within containment areas.
   (b) All fuel and chemical storage (if any) shall be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.
   (c) Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.
   (d) All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.
   (e) The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.
   (f) Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.
   (g) Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized to dispose of hazardous waste.

222. Site plans shall be devised to ensure that, insofar as possible, all construction camps are located at least 50 meters away from a watercourse, stream, or canal. If determined warranted by the Engineer, the Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor shall ensure that all vehicle are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site. The Engineer shall undertake regular monitoring of the construction camps to ensure compliance with the SSEMP and the Construction Camp Site Plan.

223. The Contractor shall also be responsible to maintain and cleanup campsites and respect the rights of local landowners. If located outside the RoW, written agreements with local landowners for temporary use of the property will be required and sites must be restored to a level acceptable to the owner within a predetermined time period.

Concrete Batching Plants – The Contractor shall not utilize the two concrete batching plants currently used by contractors working on the GoU sections of the Project road due to their proximity to urban areas (see **Section E.11** for further details). More specifically, the following measures shall be followed to limit the potential for pollution from batching plants:

(i) To limit impacts from dust, the following conditions shall apply:

(a) Batching plants shall be located downwind of urban areas and not within one kilometer of any urban area.
(b) The entire batching area traversed by vehicles – including driveways leading into and out of the area – should be paved with a hard, impervious material.
(c) Sand and aggregates should be delivered in a dampened state, using covered trucks. If the materials have dried out during transit they should be re-wetted before being dumped into the storage bunker.
(d) Sand and aggregates should be stored in a hopper or bunker which shields the materials from winds. The bunker should enclose the stockpile on three sides. The walls should extend one metre above the height of the maximum quantity of raw material kept on site, and extend two metres beyond the front of the stockpile.
(e) The hopper or bunker should be fitted with water sprays which keep the stored material damp at all times. Monitor the water content of the stockpile to ensure it is maintained in a damp condition.
(f) Overhead storage bins should be totally enclosed. The swivel chute area and transfer point from the conveyor should also be enclosed.
(g) Rubber curtain seals may be needed to protect the opening of the overhead bin from winds.
(h) Conveyor belts which are exposed to the wind and used for raw material transfer should be effectively enclosed, to ensure dust is not blown off the conveyor during transit. Conveyor transfer points and hopper discharge areas should be fully enclosed.
(i) Conveyor belts should be fitted with belt cleaners on the return side of the belt.
(j) Weigh hoppers at front end loader plants should be roofed and have weigh hoppers shrouded on three sides, to protect the contents from the wind. The raw materials transferred by the front end loader should be damp, as they are taken from a dampened stockpile.
(k) Store cement in sealed, dust-tight storage silos. All hatches, inspection points and duct work should be dust-tight.
(l) Silos should be equipped with a high level sensor alarm and an automatic delivery shut-down switch to prevent overfilling.
(m) Cement dust emissions from the silo during filling operations must be minimised. The minimum acceptable performance is obtained using a fabric filter dust collector.
(n) Totally enclose the cement weigh hopper, to ensure that dust cannot escape to the atmosphere.
(o) An inspection of all dust control components should be performed routinely – for example, at least weekly.
(p) Batching Plants will not be permitted within 1 kilometer of urban areas.

(ii) All contaminated storm water and process wastewater should be collected and retained on site.

(iii) All sources of wastewater should be paved and bunded. The specific areas that should be paved and bunded include; the agitator washout area, the truck washing area, the concrete batching area, and any other area that may generate storm water contaminated with cement dust or residues.

(iv) Contaminated storm water and process wastewater should be captured and recycled by a system with the following specifications:
   (a) The system's storage capacity must be sufficient to store the runoff from the bunded areas generated by 20 mm of rain.
   (b) Water captured by the bunds should be diverted to a collection pit and then pumped to a storage tank for recycling.
   (c) An outlet (overflow drain) in the bund, one metre upstream of the collection pit, should divert excess rainwater from the bunded area when the pit fills due to heavy rain (more than 20 mm of rain over 24 hours).
   (d) Collection pits should contain a sloping sludge interceptor, to separate water and sediments. The sloping surface enables easy removal of sludge and sediments.
   (e) Wastewater should be pumped from the collection pit to a recycling tank. The pit should have a primary pump triggered by a float switch and a backup pump which automatically activates if the primary fails.
   (f) Wastewater stored in the recycling tank needs to be reused at the earliest possible opportunity. This will restore the system's storage capacity, ready to deal with wastewater generated by the next rainfall event. Uses for recycling tank water include concrete batching, spraying over stockpiles for dust control and washing out agitators.

E.8.5 Borrow Pits

Potential Impacts

224. Opening and operating of borrow pits can result in multiple environmental and social impacts, including degradation of productive soils, elevated levels of noise, degradation of air quality, etc. The Designers have identified existing, licensed borrow pits which can provide the necessary quantity of materials for the Project (see **Section C.5.3 – Source of Construction Materials**). **Table C.7** indicates that two of these borrow pits (Guzar and Kashkadarya) are located within close proximity to residential properties and as such could result in significant noise and dust impacts. However, it should be noted that the Contractor shall make the final decisions on the borrow pits that he wishes to use.

Mitigation Measures

225. Several mitigation measures are recommended for borrow pits:

(i) Alternatives to the borrow pits at Guzar and Kashkadarya should be considered given their potential impacts to residential areas close to these sites.

(ii) If the Contractor intends to use any existing borrow pits as an alternative to those listed in **Table C.7** then a due diligence review shall be carried out by the Engineer to confirm that these new sites identified for use by the Contractor are indeed operating or operable in an appropriate manner. This will include review of the borrow pits operational license and its potential environmental impacts, such as its proximity to sensitive receptors.. A copy of the agreement between the operator and the Contractor should also be provided to the Engineer.

(iii) For any new borrow pit to be opened and operated by the Contractor, the Contractor will be responsible for the preparation of a Borrow Pit Action Plan (BAP). The BAP will be submitted to the Engineer prior to the start of construction. The plan will identify the locations of all proposed borrow pits which will also be approved by both the Engineer, Goskompriroda and representatives of the EA. The plan shall ensure that:

(a) Pit restoration will follow the completion of works in full compliance with all applicable standards and specifications.

(b) Arrangements for opening and using material borrow pits will contain enforceable provisions.

(c) The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Engineer will be required before final acceptance and payment under the terms of contracts.

(d) Additional borrow pits will not be opened without the restoration of those areas no longer in use.

E.9 Social and Cultural Aspects

E.9.1 Community Health and Safety

Potential Impacts

226. Potential impacts due to the proposed construction can be identified as follows:

(i) Social Conflict. In some instances the local population may not be able to provide the necessary skilled workers for the Project. In such cases workers from other regions, or other countries may be employed by the Contractor. This could lead to social tensions and potential conflict if these workers are not aware of local customs and practices.

(ii) Road Safety. Construction of the road may result in an increase in the total number of road traffic accidents between vehicles, pedestrians and vehicles (especially in the areas close to schools and colleges) and livestock and vehicles.

(iii) Air and water quality. Potential air and water quality issues and their impacts to the local population are discussed above under item **E.6.1 – Air Quality and Climate** and **Item E.8.4 Construction Camps and Batching Plants**.

(iv) Noise levels with health consequences. The various mechanical processes during the construction of roads are a source of intense noise, which can adversely affect humans. Typical noise signatures of the different equipment for different construction activities are enumerated below.

Table E.3: Construction Noise Examples					
Site Clearing		Excavation and Earth Moving		Structure Construction	
Equipment	Noise Level	Equipment	Noise Level	Equipment	Noise Level
Bulldozer	80	Bulldozer	80	Pneumatic drill	81–98
Front end loader	72–80	Backhoe	72–93	Crane	75–77
Dump Truck	83–94	Dump Truck	83–94	Welding Machine	71–82
Grading and compacting		Jack Hammer	80–93	Concrete Mixer	74–88
Grader	80–93	Landscaping and Clean Up		Concrete Pump	81–84
Roller	73–75	Bulldozer	80	Concrete Vibrator	76
Paving		Excavator	72	Air Compressor	74–87
Paver	86–88	Truck	83–94	Bulldozer	80
Truck	83–94	Paver	86–88	Cement and Dump trucks	83–94
Tamper	74–77				

227. The road passes through several settlements and as such noise levels from construction activities may be elevated above Uzbek noise standards during construction hours. In addition significant noise impacts may result from long-term exposure to noise from construction facilities such as rock crushing plants and quarries where operational activities may last for the entire construction period.

228. Baseline noise monitoring undertaken by independent monitoring contractors in June, 2016 indicated that existing noise levels in the Project corridor meet the GoU standards for both daytime and night-time noise. Increased volumes of traffic during the operational phase of the Project will however lead to increased noise levels within the Project corridor. A question remains if the increased traffic volumes will result in noise levels elevated above the GoU standards. During meetings with ADB and the IEE Consultants in May, 2016, the ADB suggested that modeling of noise should be undertaken to further assess this issue. To date the modeling has not been possible, mainly due to a lack of capacity within Uzbekistan to complete this task. Accordingly, the following recommendations are made to address this issue:

(i) The IEE Consultants will contact several (at least three) international environmental consultancies with in-house noise modeling capacity and provide them with the terms of reference for the noise modeling exercise. Date – 15th August, 2016.
(ii) The noise modeling consultants will provide a brief technical and cost proposal for the works. Date – 21st August, 2016.
(iii) The IEE Consultants will provide the cost estimates to the ADB for approval. Date – 25th August, 2016.
(iv) After approval of the costs by the ADB, the IEE Consultants will issue a notice to proceed to the most cost effective proposal that meets the requirements of the terms of reference. Date – estimated first week of September, 2016.

(v) The noise modeling consultants shall mobilize and undertake noise monitoring. Date – second week of September, 2016.
(vi) The noise modeling consultants shall prepare and submit a report of their findings to the IEE Consultants. Date – Second half of September, 2016.
(vii) Based on the findings of the noise modeling consultants, the IEE Consultants shall update this IEE to include the modeling results and any required mitigation measures. Date – end of September, 2016. The findings of the modeling exercise will be clearly reflected within the bidding documents.

Mitigation Measures

229. Mitigation measures to limit community health and safety impacts include:

Road Safety - Given that the traffic volumes are anticipated to rise once construction is complete, the percentage of those affected by road accidents may actually decrease as a result of traffic safety measures, and improvements to the road condition. Notwithstanding the above, the following traffic safety issues shall be accounted for during the design phase of the Project:

(i) Safety barriers and fencing;
(ii) Traffic signs;
(iii) Road Crossings;
(iv) Speed Bumps;
(v) Speed limits;
(vi) Temporary access/bridges to houses; and
(vii) Street lighting.

It is especially important to consider additional traffic safety measures close to schools, including reduced speed limits (maximum 50 kilometers per hour) and traffic calming measures such as speed bumps.

Social Conflicts. The Contractor shall provide regular health and safety training to their workers which will include sessions on social and cultural awareness.

Noise and Vibration. To limit elevated noise levels impacting upon the local community the Contractor shall be responsible for ensuring the use of:

(i) Source Controls, i.e., requirements that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken;
(ii) Site Controls, i.e., requirements that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible;
(iii) Work near Sensitive Receptors shall be limited to short term activities. No concrete batching plants, rock crushing plants or any long term generators of significant noise shall be allowed within 500 meters of sensitive receptors;
(iv) Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work

hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the site engineer having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. When operating close to sensitive areas such as residential, nursery, or medical facilities, the Contractor's hours of working shall be limited to 8 AM to 6 PM;

(v) Community Awareness, i.e., public notification of construction operations will incorporate noise considerations; methods to handle complaints will be specified. Sensitive receptors will be avoided as possible (i.e., aggregate crushers, operators, etc.). Disposal sites and haul routes will be coordinated with the PMU.

E.9.2 Occupational Health and Safety

Potential Impacts

230. Accidents are common during a project of this size and scale. Accidents can occur if workers are not adequately trained or qualified for the job or if they have incorrect safety equipment and clothing.

Mitigation Actions

231. An OHS Plan shall be prepared by the Contractors to manage worker safety. The OHS Plan shall include the following items:

(i) Safety Training Program. A Safety Training Program is required and shall consist of:

a. Initial Safety Induction Course. All workmen shall be required to attend a safety induction course within their first week on Site.

b. Periodic Safety Training Courses. Period safety course shall be conducted not less than once every six months. All Subcontractor employees will be required to participate in relevant training courses appropriate to the nature, scale and duration of the subcontract works. Training courses for all workmen on the Site and at all levels of supervision and management.

(ii) Safety Meetings. Regular safety meetings will be conducted on a monthly basis and shall require attendance by the safety representatives of Subcontractors unless otherwise agreed by the Engineer. The Engineer will be notified of all safety meetings in advance. The Engineer may attend in person or by representative at his discretion. The minutes of all safety meetings will be taken and sent to the Engineer within seven days of the meeting.

(iii) Safety Inspections. The Contractor shall regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. Lights and signs shall be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately.

(iv) PPE - Workers shall be provided (before they start work) with of appropriate personnel safety equipment suitable for electrical work such as safety boots, helmets, gloves, protective clothes, goggles, and ear protection at no cost to the workers. Site agents/foremen will follow up to see that the safety equipment is used and not sold on. In addition, life vests should be provided to Contractors staff working on the Kashkadarya bridge piling works.

232. In addition, all Project sub-contractors will be supplied with copies of the SSEMP. Provisions will be incorporated into all sub-contracts to ensure the compliance with the SSEMP at all tiers of the sub-contracting. All subcontractors will be required to appoint a safety representative who shall be available on the Site throughout the operational period of the respective sub-contract unless the Engineers approval to the contrary is given in writing. In the event of the Engineer's approval being given, the Engineer, without prejudice to their other duties and responsibilities, shall ensure, as far as is practically possible, that employees of subcontractors of all tiers are conversant with appropriate parts of the SSEMP.

233. It shall be a requirement of the Contract that the Contractor subcontracts with an Approved Service Provider to provide an HIV Awareness Program to the Contractor's Personnel and the Local Community as soon as practicable after the Contractor's Personnel arrive at the Site but in any case within two weeks after the Contractor's Personnel arrive at Site and to repeat the HIV Awareness Program at intervals not exceeding four months.

234. Zones with noise level above 80 dBA must be marked with safety signs and appropriate PPE must be worn by workers.

E.9.3 Emergency Response Planning

Potential Impacts

235. Emergency situations may arise during the construction phase, for example, fires and explosions at construction camps (through poor management and storage of fuels and chemicals), or impacts caused by earthquakes.

Mitigation Measures

236. The Contractor will be responsible for preparation of an Emergency Response Plan (ERP) which will include sections relating to:

(i) Containment of hazardous materials;
(ii) Oil and fuel spills;
(iii) Fire and explosions;
(iv) Work-site accidents; and
(v) Earthquake hazards.

237. The plan will detail the process for handling, and subsequently reporting, emergencies, and specify the organizational structure (including responsibilities of nominated personnel). The plan will be submitted to the Engineer for approval.

Implementation of the plan will be monitored by the Engineer. Any emergencies, and how they were handled, will be reported in monthly progress reports by the Contractor to the Engineer. The Engineer will also provide periodic monitoring of the Contractors works throughout construction to ensure the ERP is implemented effectively.

E.9.4 Physical and Cultural Resources

Potential Impacts

238. Several cemeteries are located close to the road, all of them are outside of the RoW however, two cemeteries at km 54 and km 59.6 are within the RoW. It was also noted during the public consultation meetings that a cemetery was located close to the road at km 69 – however, further investigation of the site (see **figure E.1**) following the meetings revealed that this site is unlikely to be impacted by the Project due to its distance from the road (14 meters) and the fact that road widening will occur on the opposite site of the road. In addition, given the rich cultural heritage of this region of Uzbekistan it is possible that unexpected discoveries of physical and cultural resources could occur in the construction process.

Figure E.1: Following up Consultation Queries (25/05/16)

Mitigation Actions

239. In the event of any chance finds during the construction works procedures shall apply that are governed by Uzbek legislation and guidelines. Regarding the cemetery at km 59.6 it is likely that a portion of the cemetery wall will need to be removed to accommodate a slight change in alignment within this portion of the road. Prior to the removal of the cemetery wall consultations will be undertaken with the local community to ensure that no impacts to graves will occur and that a suitable replacement wall is constructed.

240. Two other cemeteries were noted outside of the RoW, but close enough to potentially impacted be by project works during the construction phase. At both of these sites (km 103 and km 122) temporary fencing should be placed around the cemetery prior to construction in this area to ensure no encroachment into this area during rehabilitation works.

E.10 Cumulative Impacts

E.10.1 Cumulative Impacts Identified

241. Cumulative impacts of the Project will be those associated with the portions of the Karshi - Shahrizabz - Kitab road that are to be constructed by the GoU. The main cumulative impacts relate to increased traffic. Traffic levels on ADB portions of the road will not increase without the completion of the other road sub-sections. The main cumulative impacts resulting from the increased traffic will be elevated noise levels during the operational period. Air quality may be compromised slightly in the form of vehicular emissions, but levels of dust will decrease significantly – this will generally lead to improvements in terms of health conditions. Increased traffic in urban area may lead to an increase in accidents between vehicles and pedestrians, however, the safety measures proposed for the project should help to limit such impacts.

242. Mitigation for the cumulative impacts has been provided by the section on noise above and air quality.

E.11 Due diligence assessment of Impacts Associated with Government Road Section

243. As noted in **Section B.2.2**, the Project has already been subject to ZVOS and the relevant approvals have been given by Glavgosecoexpertiza of Goskompriroda. However, as also noted in **Section A.4,** in accordance with the concept of an associated facility (ADB SPS. Appendix 1, para. 6) it is necessary to mention that sections funded by the GoU are associated facilities to this project.

244. A review of the recommendations of the Glavgosecoexpertiza Approved IEE has been undertaken, the conclusions of the review are presented below by **Table E.3** including the extent to which Glavgosecoexpertiza recommendations have been implemented and the recommendations of this IEE to ensure that any non-compliance is remedied.

Table E.4 – Glavgosecoexpertiza Approved IEE Recommendations

#	Glavgosecoexpertiza Recommendation	Implementation	Additional Recommendations
1	In order to protect land reclamation and return the land that had been reserved for roadside quarries and lateral reserves, access roads	Project works still in progress.	The PMU should ensure that after the completion of Project works the Contractors re-instate all land to their former state, including the replacement of top-soils.

	and temporary production bases for road-builders.		
2	In purpose of protection of atmospheric air at roadside and protection of crops from vehicle emissions and dust, runoff from roads and improving the aesthetic perception, it is necessary to install forest shelterbelts.	There was no obvious sign of road planting associated with Project works, although general tree planting appeared to be occurring.	It is not known to what extent tree planting will reduce atmospheric air pollution, although it is possible that it could reduce the impacts of dust on crops and improve aesthetics if the correct native tree species are planted. The Contractor should however, follow the tree planting program outlined in the Projects feasibility study (see **Appendix R).**
3	After the construction is completed the river arm-hole should be cleaned out and garbage should be transported to special places which are coordinated with the governmental authorities.	Project works still in progress.	The cleaning of all river areas where construction activities have occurred should be a part of the Contractors responsibilities monitored by the Engineer. The PMU should ensure that all construction sites, not only around rivers, are clean from any waste materials at the completion of construction works.
4	Felling of 48,502 trees is required in the design of land platform in the spots of broadening. It is essential to reconsider and minimize this amount at the next stage.	Discussions with the PMU indicate that the number of trees cut was not reduced from this original number.	Tree cutting in the GoU sections has been completed and as such there is no way to minimize this number.
5	Considering the fact that storm sewers will be polluted by petrochemicals it is necessary to include sinkers and oil separators in the feasibility study.	Review of the feasibility study indicates that this item was not included.	The PMU should review designs to assess if it is possible to reconsider implementing this recommendation.
6	It is essential to work with smoke and dust forming equipment in living areas as far as it is possible from houses during the construction and to prevent storage of	It is noted that some concrete batching plants were within 50 meters of urban settlements.	Batching plants can generate significant dust impacts and should not be located within 500 meters of urban areas. It is recommended that the PMU make arrangements with the Contractor to cease

	wastes of the construction close to lands allotted for settlement.		procurement of concrete from these plants.
7	At the next stage of the project it is essential to develop environment protection measures to decrease negative impact to the environment during the operation of the road.	The only plan prepared for the operational phase of the Project is one relating to tree planting (see below).	The PMU should consider developing an action plan to monitor noise and air quality impacts during the operational phase of the project.
8	A tree management plan should be developed. This document should prove the necessity of trees which will be cut off and to provide measures which will minimize this quantity. Also it should cover the planting of new trees and plan of re-cultivation of disturbed land and ways of ecologically proven operating of wastes caused by the construction.	A plan was produced as part of the feasibility study (see **Appendix R**)	No further recommendations.

245. In addition to the review of the Glavgosecoexpertiza approved IEE, all GoU funded sections were visited as part of this IEE. The visit formed a part of the initial site surveys for the ADB portions of the work, and by that, it should be noted that only visual observations of the current construction works on the GoU sections were undertaken – no consultations were undertaken for these sections and no visits to borrow pits, or batching plants were undertaken. Three specific issues were however noted:

Table E.5. Site Visit Issues and Recommendations

#	Item	Comment and Risk	Recommendation
1	Concrete Batching	Two concrete batching plants were noted within 50 meters of urban settlements, both of which were utilized by the Contractor. These plants can generate significant dust impacts and should not be located within 500 meters of urban areas.	It is recommended that the EA make arrangements with the Contractor to cease procurement of concrete from these plants.
2	Occupational Health and Safety	Few of the workers at any of the construction sites appeared to be wearing personal protective equipment (PPE). In addition,	The EA, though its engineer, should ensure that all Contractors staff wear the appropriate PPE for the

		many of the work sites were not well managed in terms of safety, e.g. lack of traffic safety signs, safety barriers, etc. This could result in significant health and safety impacts to workers.	workplace. The Engineer should also ensure that safety measures are applied at all work sites.
3	Cultural Heritage	According to a resolution of the regional Khokimyat in Guzar region a site of Republican importance "Tokhir and Zukhra" is located along the Karshi-Shahrizabz road between km 22 and 23 on the right side of the road. The size of the site is 0.78ha. Construction works in this area could negatively affect this site.	The site appears to be outside of the RoW, but the Contractor should consult with the relevant authorities prior to the start of project works in this area to ensure that there is access to the site during the construction period and that it is not affected negatively by construction works.
4	Public Health and Safety	During the public meetings a comment was raised regarding excavation works in the GoU section in Shahrizabz. It was noted that excavation of a portion of the road meant that locals could no longer cross the road. The old crossings had been removed and there was no longer a way for children to cross the road to get to school (see **Figure E.2**).	It is recommended that the PMU raises this issue with the Contractor for this section of the road in order for the Contractor to provide suitable crossings for the local population.
5	Flooding	During the public meetings another comment was raised regarding potential flooding of property in Jambo village.	From design km approx. 81+500 to 82+100 a re-alignment to the right hand side is foreseen in the design and surface run-off water should not affect the village. No further recommendations.

Figure E.2: Construction works have limited access to the opposite side of the road.

E.12 Compliance Impacts

246. In addition to the impacts associated with the construction and operation phases of the project several compliance impacts have also been identified as follows:

(i) Lack of Environmental Clauses in Contracts - The IEE is an environmental statement by the RRF. While it is prepared by the IEE consultant the IEE defines the commitment by the GOU through the proponent and its contractors and consultants, to implement the mitigation and monitoring actions listed in the IEE. For the measures proposed in the IEE's EMP to be taken seriously, they must become legally binding through inclusion as environmental clauses in the loan agreement between the GOU and the ADB as well as the specifications in the contract-bid documents. This will be achieved by integrating the EMP into the contract specifications as a clause and using the EMP to prepare SSEMPs defining specific steps to be taken by the contractors and the government during the project construction phase. References to the EMP will be made in the loan agreement between the GOU and ADB. It will be the Engineers responsibility to review the environmental mitigation and monitoring activities undertaken by the Contractor, with payments made only after verification that each work component has been completed as prescribed.

(ii) Lack of Construction Compliance Inspection Services and Environmental Training - While the EMP and the environmental covenants can be very clear and specific, if there is no one knowledgeable to undertake compliance monitoring, inspection and regular reporting, little of the EMP will be implemented or completed. The Engineer, through his Environmental Manager and International Environmental Specialist, will ensure that compliance inspections are undertaken on a regular basis. In addition, the Engineers International Environmental Specialist will also provide training to the Contractor and his HSE team in the correct implementation of the SSEMPs prior to the commencement of works.

F. Environmental Management Plans and Institutional Requirements

F.1 Introduction

247. This section of the report provides the Projects Environmental Management Plan (EMP) and the necessary institutional requirements to implement the Plan. In addition, the approximate costs of the EMP is outlined.

F.2 EMP Institutional Requirements

F.2.1 EMP

248. The EMPs herewith provides the overall Project environmental management framework. It provides summary information of the types of impacts, which are described in detail in the Projects Initial Environmental Examination. It also provides detailed information about the required mitigation and monitoring measures, the implementation arrangements and the reporting requirements.

F.2.2 Site Specific EMP (SSEMP)

249. The SSEMPs are the documents that the Contractor (or Contractors, if there is more than one Lot) shall prepare (with the assistance of the Engineers International Environmental Specialist) outlining how he intends to implement the EMP and ensure that all of the mitigation and monitoring is completed according to the implementation arrangements specified in this EMP.

250. Each SSEMP shall describe the precise location of the required mitigation / monitoring, the persons responsible for the mitigation / monitoring, the schedule and reporting methodology.

251. The SSEMPs will be submitted to the PMU for approval at least 10 days before taking possession of any work site. No access to the site will be allowed until the SSEMPs are approved by the PMU.

F.2.3 Bid Documents

252. The Bid Documents for the potential Contractor(s) shall contain two sections relating to environmental issues, firstly a basic clause indicating that the Contractor will be responsible for following the requirements of this EMP and that he should prepare his own SSEMP for the Project. Secondly, the EMP shall be repeated in its entirety as an Annex to the Bid Documents so as the bidder is aware of his environmental requirements under the Project and help him put environmental costs to his proposal.

F.2.4 Contract Documents

253. The Contract Documents should follow a broadly similar pattern to the Bid Documents. It is not considered necessary to repeat the mitigation measures verbatim in a list of environmental contract provisions, rather the Contract should specify that the

Contractor(s) is responsible for implementation of the EMP via his SSEMPs. Again, the EMP should be included as an Annex to the Contract so the Contractor(s) is liable for any non-conformance with the EMP, and thereby this IEE.

F.2.5 Contractor Requirements

254. As stated above, the Contractor(s) will be responsible for the preparation of the SSEMPs. However, it is noted that in some instances the Contractor can struggle with this responsibility. As such, it is recommended that the Engineers International Environmental Specialist works with the Contractor and his HSE team to develop the SSEMPs, endorse the SSEMPs before submission to PMU for approval. The SSEMPs will need to be fully compliant with the EMP and will need to be prepared within 30 days of Contract award and approved 10 days prior to commencing any physical work including campsite mobilization.

255. During construction the Contractor must retain the expertise of an Environmental Officer (EO) to implement and continually update the SSEMPs and to oversee and report on the operation throughout the contract period. The EO should be full-time member of staff on the Contractors roster and should be on site five days per week.

256. The required qualifications of the EO are as follows:

(i) Degree in environmental sciences and related expertise.
(ii) Fluent in Uzbek, Russian. English is an advantage.
(iii) Experience of at least one construction project of a similar size and scale.

257. The Contractor(s) EO is also responsible for engaging external service from a certified laboratory for environmental instrumental monitoring such as air quality monitoring, noise and water. The monitoring requirements for each time need to be approved by the Engineer. The EO will also be responsible for the preparation of weekly environmental checklists and an environmental section of the contractor's monthly progress reports that shall be submitted to the Engineer for review.

258. The monthly reports, which will include the weekly environmental checklists, shall contain sections relating to:

(i) General Progress of the Project
(ii) Environmental Incidents; e.g. spills of liquids, blasting issues
(iii) Progress of any environmental initiatives, e.g. protection of sensitive sites
(iv) Records of any environmental monitoring, both observational and instrumental
(v) Conclusions and Recommendations

259. The EO shall provide daily toolbox training at the construction camp and also at construction sites. The EO shall keep a record of all monthly training and toolbox training undertaken.

260. The training programs shall be developed by the Engineer's IES.

F.2.6 Engineer Requirements

261. As noted in the mitigation plans below, the Engineer is tasked with specific responsibility to ensure safeguard compliance of civil works – with particular emphasis on the monitoring of implementation of EMP through the Contractors SSEMP and related aspects of the project.

262. The Engineer should retain the use of Environmental Specialist, both national (NES) and international (IES), to ensure that the Contractor is compliant with his environmental obligations. A terms of reference for both specialists is provided below.

National Environmental Specialist

Scope of Services: He/she will (i) review all documents and reports regarding the integration of environmental including contractor's environmental action plan, (ii) supervise the contractors' compliance to EMP, and (iii) prepare monthly compliance reports.

Qualification: Degree in environmental sciences or equivalent. Preferably five (5) years' experience in conducting environmental impact assessments and implementation of environment mitigation plans and/or monitoring implementation of environmental mitigation measures during implementation of projects including highway projects funded by developing partners.

Time Period – The NES shall be employed intermittently for a period of eight months over the duration of the construction period (18 months).

International Environmental Specialist

Scope of Services: During the supervision stage the Specialist will prepare a detailed action plan including environmental monitoring checklists to be completed by the NES to ensure that the Environmental Management System is established, implemented, maintained and will monitor its performance. He/she will also take care of all environmental issues during construction works. He/she will also conduct environmental training and briefings to provide environmental awareness on ADB and the government environmental safeguards policies, requirements and standard operating procedures in conformity with the government's regulations and international practice for project and EA staff; ensure baseline monitoring and reporting of Contractor's compliance with contractual environmental mitigation measures during the supervision stage. The IES will also help the with the development of the Contractors SSEMPs (at least three months prior to the start of construction).

Qualification: Degree or diploma in environmental sciences or equivalent. Preferably twelve (12) years' experience in conducting environmental impact assessments and implementation of environment mitigation plans and/or monitoring implementation of environmental mitigation measures and health and safety plans during implementation of projects including highway projects funded by developing partners, including 8 years' international experience. Working knowledge in Russian Language and experience in CIS countries is preferred.

Time Period: The IES shall be engaged on a part-time basis for a period of three months spread over the duration of the construction period (18 months). The specific on-site inputs will be determined by the Engineer and the PMU.

F.2.7 PMU Requirements

263. In addition to the Contractor's full-time EO and the Engineer's part-time NES backed up with an IES, it is required that PMU designate a full-time safeguard position to manage and coordinate the contractors and Engineer in reporting to EA and ADB on safeguard performance of the project. It is required that the IES provides a short training program to the PMU safeguard person and Contractors EO prior to the start of construction to develop their knowledge and understanding of the environmental, social, health and safety aspects of the Project.

264. The following provides a terms of reference for the PMUs Safeguards Specialist:

Scope of Services: Supervise the Engineer and Contractors in EMP implementation for overall compliance with SPS 2009 requirements and project environment-related legal covenants. With assistance of the Engineer, prepare, submit to the EA and ADB, and disclose semi-annual environmental monitoring reports on ADB website. Report in a timely manner to ADB of any non-compliance or breach of ADB safeguard requirements. Update the IEE in case of technical design changes or unanticipated impacts. Make sure that the GRM is operational to effectively handle environmental and social concerns of project affected persons.

Qualification: Degree in environmental sciences or equivalent. Preferably five (5) years' experience in conducting environmental impact assessments and implementation of environment mitigation plans and/or monitoring implementation of environmental mitigation measures during implementation of projects including highway projects funded by funding agencies. Fluent in English, Russian and Uzbek.

Time Period – The Safeguards Specialist shall be employed on a full-time basis for the duration of the contract.

F.3 Environmental Management Plan

265. The following table (**Table F.1**) provides the environmental mitigation for the Project.

Table F.1: EMP

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
Air Quality	Construction impacts	• Preparation of an Air Quality Plan (AQP).	• Contractor to prepare AQP • Engineer to review and approve AQP.
	Air quality impacts from stationary sources	• Locations for quarry sites, borrow pits and concrete batching plants require approval from the Engineer and Goskompriroda. • No quarry, borrow pit or batching plant shall be located within one kilometer of any urban area or sensitive receptor.	• Contractor to select sites. • Engineer and Goskompriroda to approve sites.
	Open burning of waste materials	• No burning of debris or other materials will occur on the at any camp or construction site without permission of the Engineer.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
	Fuel Emissions	• No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the Engineer.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
	Rock-crushing plant	• Rock crushing plant equipment shall be fitted with water sprinklers that will run continuously while the plant is operational.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
	Exhaust emissions from the operation of construction machinery	• Construction equipment shall be maintained to a good standard and fitted with pollution control devices.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
	Fugitive emissions.	• Conveyor belts (e.g. at batching plants and rock crushing plants) shall be fitted with wind-boards, and conveyor transfer points and hopper discharge areas shall be enclosed to minimize dust emission.	• Contractor to implement mitigation. • Engineer to routinely

		• All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins. • All roads within the construction areas of the Site shall be sprayed at least twice each day, and more if necessary.	monitor Contractors activities.
	Air quality impacts from Vehicle movements during operational phase	• The PMU should undertake annual air quality monitoring in urban areas to determine if dust levels generated from vehicle movements on the Project road are within the limits set by the GoU.	• PMU
Climate Change	Cement Concrete Pavement Joints	• Consider adopting plastic joint profiles made of ethylene-propylene-diene monomer rubber (EPDM).	• TDI
	Corrosion of steel reinforcements in concrete structures	• Assess if the use of advanced concrete materials and structures will help improve the durability of concrete infrastructure and their adaptation to climate change.	• TDI
	Damage to roads and drainage systems due to increased flooding	• Assessment of 1/50 year flood return period for all bridges and roads embankment. • Recommend measures to mitigate the flood risks of all planned project roads. • Increase capacity of side and cross drains to accommodate more intense floods.	• TDI
	Increase in scouring of roads, bridges, and support structures	• Assess designs of piers, abutments and embankments to determine if protection methods (e.g. rip-rap) are required to cope with additional water volumes and increased flow intensity.	• TDI
Borrow Pits and Quarry's	Suitability of borrow pits	• Alternatives to the borrow pits at Guzar and Kashkadarya should be considered given their potential impacts to residential areas close to these sites.	• PMU and Contractor to consider alternatives borrow locations.

	New Quarry Sites	• Any new quarries must obtain the required permits prior to commencement of works at these sites, this shall include approval from Goskompriroda and the Engineer. • No quarry shall be located within one kilometer of any urban area or sensitive receptor.	• Contractor to select quarry sites and apply for approval from Goskompriroda and any other regulatory agencies. • Engineer to review quarry locations, licenses and approvals from Goskompriroda.
	Existing Borrow Pits	• For existing borrow pits a due diligence review will be carried out by the Engineer.	• Engineer to undertake due diligence review.
	New Borrow Pits	• Obtain all necessary permits from the regulatory authorities. • Prepare a Borrow Pit Action Plan (BAP). • No borrow pit shall be located within five hundred meters of any protected area. • Pit restoration will follow the completion of works in full compliance all applicable standards and specifications. • Arrangements for opening and using material borrow pits will contain enforceable provisions. • The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Engineer will be required before final acceptance and payment under the terms of contracts. • Additional borrow pits will not be opened without the restoration of those areas no longer in use.	• Contractor to select borrow sites and apply for approval from Goskompriroda and any other regulatory agencies. • Engineer to review borrow locations, licenses and approvals from Goskompriroda.
Bridge Construction		• All new bridges shall be designed for the life expectancy of 75 years. • The bridge rehabilitation and strengthening works shall be designed for the life expectancy of 50 years. • Bridge designs should ensure that drainage from bridge decks over 50 meters does not discharge directly to the watercourses beneath the bridges.	• TDI
	Bridge Construction	• Consult with Goskompriroda to establish the fish spawning period in relation to the bridge construction works to ensure that all works are undertaken in periods least likely to affect the fish spawning period. • Implement the specific measures relating to bridge construction outlined in **Section E.6.4** are implemented.	• Contractor to implement mitigation. • Contractor to consult with Goskompriroda regarding fish spawning periods.

			• Engineer to routinely monitor Contractors activities.
Soils Erosion and Soil Contamination	Contamination of Soils	• Implementation of the specific soil contamination mitigation measures outlined in **Section 6.3** of the IEE.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
	Loss of topsoil	• Locate topsoil stockpiles outside drainage lines and protect stockpiles from erosion. • Construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil. • Rip ground surface prior to the spreading of topsoil. • Limit equipment and vehicular movements to within the construction zones. • Remove unwanted materials from topsoil such as roots of trees, rubble and waste etc.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
	Soil Erosion	• 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.	• TDI
		• Material that is less susceptible to erosion will be selected for placement around bridges and culverts. • Re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local flora; (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
Hydrology	Drainage and Flooding	• Construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
	Discharge from Dam and Reservoir	• Coordination between the operators of the dam upstream of the Aksudarya bridge and the Contractor to avoid any discharge impacts.	• Contractor to coordinate bridge works schedule with the dam operators.
	Ground and surface water	• Implementation of the specific mitigation measures outlined in **Section 6.3** of the IEE.	• Contractor to implement mitigation.

	pollution.		• Engineer to routinely monitor Contractors
	Water Supply	• Only legally permitted water resources are used for technical water supply.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
Flora & Fauna	Tree cutting	• No tree cutting shall commence until compensation has been paid by the RFF to Goskompriroda. • The Contractor will be responsible for planting trees according to the design of the TDI. • The Contractor shall be responsible for maintenance of planted trees. • The local Khokimyat will be responsible for periodic monitoring of the trees to ensure that they are being maintained by the Contractor.	• RFF to compensate Goskompriroda. • Contractor to follow design recommendations for tree planting. • Engineer to ensure Contractors compliance with TDI design. • Contractor to maintain saplings during the construction phase. • Local Khokimyat to monitor the condition of the saplings.
	Impacts to IBA	• No construction camp, or construction facility, such as a concrete batching plant, shall be constructed within 5 km of the IBA.	• Contractor to implement mitigation. • Engineer to approve final locations.
Waste and Spoil	Waste Management	• Prepare a Waste Management Plan (WMP).	• Contractor to prepare WMP • Engineer to review and approve WMP.
	Recycling and re-use	• Where possible, surplus materials will be reused or recycled.	• Contractor to implement mitigation.
	Spoil	• Under no circumstances shall the Contractor dump excess materials on private lands. • Excess spoil shall not be dumped or pushed into any river at any location.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
	Inert Solid & Liquid waste	• Provide refuse containers at each worksite. • Maintain all construction sites in a cleaner, tidy and safe condition. • Train and instruct all personnel in waste management practices and	• Contractor to implement mitigation. • Goskompriroda to approve

		procedures. • Collect and transport non-hazardous wastes to all approved disposal sites.	any waste disposal site. • Engineer to routinely monitor Contractors activities.
	Asphalt and Concrete	• Waste asphalt will be recycled where possible for base material and shoulder material. • Waste concrete shall be crushed and re-used as fill material, or base material where possible. • Under no circumstances should concrete mixers be washed out onto open ground at construction sites, such as bridges.	• Contractor to implement any recommendations for re-use of asphalt.
	Hazardous Waste	• Storage of hazardous waste shall be in specific secure locations as identified by the waste management plan. • Hazardous liquids must be stored within impermeable bunds. • Training and suitable PPE will be provided to all personnel handling hazardous waste. • Disposal of waste materials shall be undertaken by a licensed waste management company. • Keep records of the types and volumes of waste removed from the site on a weekly basis. • A method statement for the safe handling and disposal of asbestos waste.	• Contractor to implement mitigation. • Goskompriroda to approve any waste disposal site. • Engineer to routinely monitor Contractors activities.
Construction Camps	Selection of Construction Camp Site	• Preparation of a Construction Camp Site Plan. • Construction camps shall not be located within one kilometer of an urban area and at least 50 meters from any surface water course. • Coordinate all construction camp activities with neighboring land uses.	• Engineer to review & approve Site Plan. • Engineer and PMU to approve camp locations.
	Soil and water pollution	• Implement all of the specific mitigation measures provided by **Section E.8.4**.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
	Water Supply	• Ensure that potable water for construction camps and workers meets the necessary water quality standards.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
Concrete Batching Plants	Concrete Batching Plants	• No batching plant shall be located within one kilometer of an urban area and at least 50 meters from any surface water course. • The Contractor shall not utilize the two concrete batching plants	• Contractor to implement mitigation. • Engineer to routinely

		currently used by contractors working on the GoU sections of the Project road. • In addition, all of the mitigation measures for batching plants outlined in **Section 8.4** of the IEE shall be implemented, including measures to limit air and water pollution.	monitor Contractors activities.
Occupational Health and Safety	Worker Health and Safety	• Prepare an Occupational Health and Safety Plan (OHS Plan). • Safety meetings conducted on a monthly basis. • Regularly inspect, test and maintain all safety equipment. • Workers shall be provided (before they start work) with of appropriate personnel safety equipment.	• Contractor to prepare OHS Plan. • Engineer to review and approve OHS Plan.
	HIV / AIDS	• Subcontract with an Approved Service Provider to provide an HIV Awareness Program to the Contractor's Personnel and the Local Community. • Repeat the HIV Awareness Program at intervals not exceeding four months	• Contractor to implement mitigation. • Service Provider to implement training. • Engineer to review program.
	Worker Health & safety	• Develop a Safety Training Program. • Safety Meetings conducted on a monthly basis. • Regularly inspect, test and maintain all safety equipment. • Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately. • Safety equipment and protective clothing are required to be available on the Site at times. • All construction plant and equipment used on or around the Site shall be fitted with appropriate safety devices. • A fully equipped first aid base shall be provided. • Coordinate with local public health officials and shall reach a documented understanding with regard to the use of hospitals and other community facilities.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
	Sub-contractor H&S	• All sub-contractors will be supplied with copies of the SSEMP. • Provisions to be incorporated into all sub-contracts to ensure the compliance with the SSEMP. All sub-contractors will be required to appoint a safety representative who shall be available on the Site.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors and sub-contractors activities.

	Traffic Safety	• Traffic safety issues shall be accounted for during the design phase of the Project. • Consider additional traffic safety measures close to schools, including reduced speed limits (maximum 50 kilometers per hour) and traffic calming measures such as speed bumps. • Submit a Traffic Management Plan to local traffic authorities prior to mobilization.	• TDI to prepare designs. • Engineer to review and approve design documents. • Contractor to prepare Traffic Management Plan. • Engineer to approve Traffic Management Plan.
	Noise	• Zones with noise level above 80 dBA must be marked with safety signs and appropriate PPE must be worn by workers.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
	Operational phase traffic noise	• The IEE Consultants will engage noise modeling specialists to assess the potential operational noise impacts of the Project. The IEE will then be updated according to the findings of the modeling.	• IEE Consultants to engage noise modeling specialists and update the IEE. • Noise modeling specialists to undertake the modeling exercise.
Community Health and Safety	Road closures, diversions and blocking of access routes	• Provision of all road diversion signs and ensure that diversion roads do not impact negatively upon private lands. • Any diversions shall be agreed upon by the Engineer. • All access routes shall be kept open during Project works for at least 50% of the day during construction works and 100% of the time after construction works are completed for the day.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
	Traffic safety	• 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. • Access roads for borrow pits, batching plants, etc, should be maintained during the construction phase and rehabilitated at the end of construction.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.

	Construction Noise and Vibration	• All exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken. • Stationary equipment will be placed as far from sensitive land uses as practical and provided with shielding mechanisms where possible. • Work near Sensitive Receptors shall be limited to short term activities. • Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. • When operating close to sensitive areas such as residential, nursery, or medical facilities, the Contractor's hours of working shall be limited to 8 AM to 6 PM. • Public notification of construction operations. • Disposal sites and haul routes will be coordinated with local officials.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
	Increased noise levels due to increased number of vehicles on the road.	• Noise modeling	• IEE Consultants
Infrastructure	Electrical Systems, Gas and water pipes	• All power lines gas and water pipes shall be kept operational.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
Emergency Response	Fires, explosions, earthquakes, etc.	• Preparation of an Emergency Response Plan (ERP).	• Contractor to prepare ERP • Engineer to review and approve ERP.
Physical and Cultural Resources	Impacts to Historical and archeological areas	• In the event of any chance finds during the construction works procedures shall apply that are governed by GoU legislation and guidelines. • The Contractor shall place temporary fencing around the cemeteries at km 103 and km 122. • Prior to the removal of any portion of a cemetery consultations will be undertaken with the local community to ensure that no impacts to graves will occur.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.
EMP Requirement	Preparation of SSEMPs	• Prepare SSEMPs.	• Contractor to prepare SSEMPs.

			• Engineer to review and approve SSEMPs
	Incorporation of Items into Bid Documents	• A specific environmental section shall be included within the main Bid Documents indicating that the Contractor shall be responsible for conforming with the requirements of the EMP.	• RFF to ensure EMP is included within Bid Documents.

F.4 Environmental Monitoring Plan

266. Regular monitoring of air quality, water quality and noise levels against Uzbek and IFC standards shall be carried out throughout the construction period. The party responsible for monitoring will be the Contractor, who will be obliged to report to the Engineer as well as the PMU. **Table F-2** provides the monitoring actions required during the construction phase of the Project:

Table F-2: EMP: Construction Phase Instrumental Monitoring

Issue	Mitigation	Locations	Schedule	Responsibilities	Reporting
Air Quality	The Contractor shall establish routine Air Quality Monitoring throughout the construction period. The following parameters shall be monitored: Particulate Matter (PM10 & PM2.5), Sulfur Dioxide (SO2), Nitrogen Dioxide (NO2) and Carbon Monoxide (CO). Other parameters maybe warranted as and when requested by the Engineer.	Five construction locations determined by the Engineer.	Monitoring to be undertaken once a month during construction period (18 months)	The Contractor shall hire certified laboratory to perform the monitoring activities.	The Independent Specialist shall provide his results to the Contractor and Engineer within a three days of the sampling activity.
Noise	The Contractor shall ensure that routine noise and vibration monitoring is undertaken throughout the construction period. Parameters to be monitored include: Laeq 1h (dBA), PPV	Five construction locations determined by the Engineer.	Monitoring to be undertaken once every month both daytime and night-time measurements during construction period (18 months)	The Contractor shall hire certified laboratory to perform the monitoring activities.	The Independent Specialist shall provide his results to the Contractor and Engineer within a three days of the sampling activity.
Water Quality	Baseline monitoring will be undertaken by the Contractor prior to the start of construction. This	• Kashkadarya River • Aksudarya River 200 meters	Monitoring to be undertaken monthly during bridge construction works.	The Contractor shall hire certified laboratory to perform the monitoring activities.	The Independent Specialist shall provide his results to the Contractor and

	will then be followed by routine water quality monitoring throughout the construction period. Parameters to be monitored include: pH; Suspended Solids; BOD5; COD; Coliforms; Nitrate (NO3); Phosphate (PO4); Oil and Grease Other parameters maybe warranted as and when requested by the Engineer.	upstream from the bridge site; 20 meters downstream of the bridge site; 200 meters downstream of the bridge site. Other locations maybe warranted as and when requested by the Engineer. pH monitoring should be undertaken in the Batching Plant area drainage channels.	pH testing to be undertaken bi-monthly.		Engineer within a three days of the sampling activity. Contractor to provide pH tests in monthly reports.

F.5. EMP Costs

267. Most costs associated with the environmental recommendations of the EMP are a normal part of preparing the bid and contract documents and ensuring that proper environmental provisions are incorporated therein. The installation of septic systems at construction camps, for example, is an environmental necessity, but not generally considered an "environmental cost". **Table F-3** lists the proposed mitigation measures and indicates where they would be "included in the project budget" as part of a bid document and where additional costs are a likely "environmental cost" beyond what would normally be included in a project budget.

Table F-3: EMP Mitigation Costs

Activity	Item	Number of Units / Unit cost	Cost estimate / US$	Responsibility	Source: ADB Loan	Source: Govt counterpart
Pre-construction						
SSEMPs	SSEMP	Included in Project Budget	-	Contractor	X	
Approval of Camp locations	Approval	Included in Project Budget	-	PMU / Engineer	X	X
Incorporation of Environmental Items into Bid Documents	Item in Bid Document	Included in Project Budget	-	PMU		X
Update baseline monitoring and projection including air quality and	Noise and air quality Modelling Report	Included in IEE Consultants budget	-	IEE Consultant	X	

noise modelling						
Obtain permits	Permits	Included in Project Budget	-	Contractor	X	
Review of climate change issues	Climate Change Review	Included in Project Budget	-	TDI		X
Construction						
Standard site management Additional environmental measures	Septic Tanks	Included in Project Construction costs	-	Contractor	X	
	Spill Kits	20 / US$200	4,000	Contractor	X	
	Bunds for fuel and oil storage	Included in Project Construction costs	-	Contractor	X	
	Waste containers	Included in Project Construction costs	-	Contractor	X	
	Waste Storage areas	Included in Project Construction costs	-	Contractor	X	
	Waste collection and disposal	Included in Project Construction costs	-	Contractor	X	
	Storage areas for hazardous materials	Included in Project Construction costs	-	Contractor	X	
	Drainage (including oil and grease interceptors)	Included in Project Construction costs	-	Contractor	X	
	Vehicle washing bay	Included in Project Construction costs	-	Contractor	X	
	Fire safety	Included in Project Construction costs	-	Contractor	X	
	PPE	Included in Project Construction costs	-	Contractor	X	
	Impervious hardstanding (for maintenance yards, bitumen storage, etc)	Included in Project Construction costs	-	Contractor	X	
	First aid facilities	Included in Project Construction costs	-	Contractor	X	
	Fencing around cemeteries	2 / US$ 5,000	10,000	Contractor	X	
	Water bowsers	Included in Project Construction costs	-	Contractor	X	
	Water sprinklers (rock crushing plant)	Included in Project Construction costs	-	Contractor	X	
	Dust control measures (rock crushing and batching plants)	Included in Project Construction costs	-	Contractor	X	
	Tarpaulins	Included in Project Construction costs	-	Contractor	X	
Tree cutting	Compensation fee	48,000 / US$20.8	1,000,000	RFF		X
Tree planting	Saplings and labour	38,838 / US$18.0	700,000	Contractor	X	
Tree maintenance	Labour and water	Included in Project Construction costs	-	Contractor	X	
Embankment	Vegetation,	Included in Project	-	Contractor	X	

vegetation and soil erosion measures	labour and maintenance	Budget				
Training	Safety Training	Included in Project Budget	-	Contractor	X	
	HIV/AIDS Training	4 / US$1,000	4,000	Independent Contractor	X	
	Toolbox Training	Included in Project Budget	-	Contractor	X	
	PMU Training	Included in Project Budget	-	Engineer	X	
Clean up of construction sites.	Labour, waste disposal	Included in Project Budget	-	Contractor	X	
Environmental Staff	EO	18 / US$ 2,000	36,000	Contractor	X	
	IES	3 / US$ 20,000	60,000	Engineer	X	
	NES	8 / US$ 1,000	8,000	Engineer	X	
	PIU Safeguard	18 / US$ 2,000	36,000	PIU	X	
ADB Cost						**$858,000**
GoU Cost						**$1,000,000**
Total Cost						**$1,858,000**

Table F-4: EMP Instrumental Monitoring Costs*

Activity / Item	**Frequency**	**Unit Cost**	**Cost /USD**
Routine Instrumental Monitoring			
1. Air Quality Monitoring	Monthly at locations specified by the Engineer (maximum five sites)	200 per site	18,000
2. Noise Monitoring	Monthly at locations specified by the Engineer (maximum five sites)	200 per site	18,000
3, Water Quality Monitoring	Every month during construction period at the bridge sites crossing rivers (two sites).**	400 per site	4,800
Total			**40,800**

* Construction period of 18 months
** Construction period of 6 months

G. Public Consultation, Information Disclosure & Grievance Mechanism

G.1 Public Consultations

268. According to the ADB Safeguard Policy Statement (2009):

"*The borrower/client will carry out meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. Meaningful consultation is a process that:*

1. *Begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle;*
2. *Provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people;*
3. *Is undertaken in an atmosphere free of intimidation or coercion;*
4. *Is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and*
5. *Enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.*

Consultation will be carried out in a manner commensurate with the impacts on affected communities. The consultation process and its results are to be documented and reflected in the environmental assessment report."

269. As such, public consultations have been undertaken in Chim, Yakkabog and Shahrizabz comprising eighty eight villagers, government officials and other relevant stakeholders to determine the views of the affected people and other stakeholders.

G.1.1 Public Consultation

270. Public consultations were held during May, 2016. The consultations included a summary presentation of the Project (**Appendix Q**). The following provides an overview of the consultations (names of all attendees can be found in **Appendix D**):

Table G.1: Chim Public Consultation (May, 2016)

Date: 24/05/16
Location: Kamashi District Administration

Panel Members:
Mr. Nick Skinner – International Environmental Specialist
Mr. Kudiyar Kamalov – National Environmental Specialist
Mr. Atakhodjaev Bakhtier – PMU Director
Mr. Eshmamatov Shukhrat – Vice-Governor of Economic Issues
Mr. Baratov Yodgor – District Governor Assistant
Mr. Mukhamadiev Rashid – District Governor

List of Participants:
32 Participants (see Appendix D **for list)**

#	Name	Question / Comment	Answer	IEE Status
1	Mr. Djabbarov	Chim hospital is located within 200m of the road – what will be the impacts to the hospital?	Noise and air quality monitoring will be undertaken in Chim to quantify impacts in this area. Based on the results mitigation	Baseline noise and air quality monitoring has been undertaken (see **Section D.1.1** & **Section D.4.4**). Noise and air quality modeling

			measures, such as double glazed windows, will be recommended.	will be undertaken prior to the start of construction to assess the potential operational impacts of the Project on noise levels and air quality.
2	Shuliyev Tu'ra	There is a clinic in Chim that is within 15 meters of the road. Will it be removed?	This issue will be dealt with as part of the LARP.	Additional investigations failed to identify any such clinic in the area mentioned.
3	Djurayev Suyun	When will construction activities start?	Construction is due to start in the first quarter of 2017, but first all documents need to be approved by the ADB, including this IEE.	N/A
4	Dilshod Khakimov	Will there be street lighting?	Street lighting will be provided in urban areas according to the detailed design prepared by the TDI.	As noted by **Section C.5.6** street lighting will be provided by the Project.
6		How will vegetation be irrigated during construction?	The contractor will be responsible for the maintenance of saplings during the construction phase.	**Section E.7.1** provides the procedures for tree planting and maintenance during the construction phase, including the responsibilities of the Contractor to maintain the saplings during the construction phase.
6	Norchayev Bekzod	Will heavy duty vehicles be restricted on the road?	No.	**Section E.8.1** provides requirements for Contractors to prepare a traffic management plan, which although will not restrict heavy duty vehicles on the road, will provide measures to reduce their impacts.

Figure G.1: Consultation in Chim, 24th May, 2016

Table G.2: Yakkabog Public Consultation (May, 2015)				
Date: 24/05/16 **Location:** Yakkabog District Administration **Panel Members:** Mr. Nick Skinner – International Environmental Specialist Mr. Kudiyar Kamalov – National Environmental Specialist Mr. Atakhodjaev Bakhtier – PMU Director Mr. Uktam Abdurahimov – District Governor **List of Participants:** 29 Participants (see **Appendix D** for list)				
#	**Name**	**Question / Comment**	**Answer**	**IEE Status**
1	Mr. Makhkamov	The term of the road construction period is very long, can it be shortened?	In summary, no. The construction period will be three years, with a one year defect liability period.	N/A
2	Djumayev Farkhad	The access road to my house, but	Any damage caused by construction	N/A

		now it is lower that the existing road, can it be fixed as part of the Project?	activities will be repaired by the Contractor, but any existing problems will not be fixed unless specifically designated by the detailed design.	
3	Mr. Ibragimov	We live in a small village called Jambo (approx. km 81+500 to 82+300). The road is higher than the village, we are worried that when the new road is constructed there maybe flooding in the village if the correct drainage is not installed.	The TDI will have surveyed the road and know the areas where drainage is required. However, we will note the location of the village in the IEE and make a specific recommendation for the TDI to review their designs in this village to ensure no flooding will occur.	**Section E.11** discusses this issue and notes that from design km approx. 81+500 to 82+100 a re-alignment to the right hand side is foreseen in the design and surface run-off water should not affect the village.
4	Kendjayev Kurbanazar	In Akash village trees have already been cut. How will they be replaced and by whom?	Akash village is in the GoU funded section of the project. However, the GoU procedures for tree cutting should still apply in this portion of the road.	N/A
5	Eshdavlatov Bakhrom	A cemetery is located within 25 meters of the road at km 69 close to Qozok village. How will this cemetery be affected?	We will come and take a look at the site tomorrow and make recommendations.	**Section E.9.4** indicates that further investigation of the site revealed that this site is unlikely to be impacted by the Project due to its distance from the road (14 meters) and the fact that road widening will occur on the opposite site of the road.
6	Khudjankulov Yigitali	A small irrigation canal is located close to the road in my village,	The TDI will design the road to ensure that where practical, impacts to irrigation	**Section E.8.1** provides the procedures for consultations with local communities before the

		how will this be affected?	are minimized. If the canal will be impacted the Contractor will be obliged to consult with the users of the canal to ensure that there are no impacts to the canal during operational periods, e.g. ensuring works occur during the winter, or by diverting the canal.	removal or disruption of irrigation channels.

271. Other questions and comments raised by the participants, which are not related to environmental issues, are not included in the table above.

Figure G.2: Consultation in Yakkabog, 24th May, 2016

Table G.3: Shahrizabz Public Consultation
Date: 25/05/16 **Location:** Shahrizabz District Administration

Panel Members:
Mr. Nick Skinner – International Environmental Specialist
Mr. Kudiyar Kamalov – National Environmental Specialist
Mr. Atakhodjaev Bakhtier – PMU Director
Mr. Abdurasul Safarov – Vice Governor of Shahrizabz District

List of Participants:
27 Participants (see Appendix D **for list)**

#	Name	Question / Comment	Answer	IEE Status
1	Kushvakov Kurbon	The road has been excavated on one side, and now it is impossible for us to cross the road, for the kids to get to school.	This is in a GoU funded section of the Project, but it is noted that this is an issue. A traffic management plan and grievance mechanism should prevent these kinds of impacts occurring.	This issues are discussed in the due diligence of the GoU works (see **Section E.11**).
2	Islomov Dilmurod	We have a large irrigation pipe that irrigates 300 hectares. What will happen to this pipe?	The TDI will design the road to ensure that where practical, impacts to irrigation are minimized. If the pipe will be impacted the Contractor will be obliged to consult with the users of the pipe to ensure that there are no impacts to the pipe during operational periods, e.g. ensuring works occur during the winter, or by diverting the pipe during construction.	**Section E.8.1** provides the procedures for consultations with local communities before the removal or disruption of irrigation channels.
3	Teshaev Gayrat	Will there be replanting of trees? Who will irrigate the trees? Will grass and flowers be planted in city medians?	Yes. The TDI will recommend locations and types of trees to be replanted. The Contractor will be responsible for maintaining the trees and plants during the construction period. We do not know if flowers will be planted in medians, this is not a focus of	**Section E.7.1** provides the procedures for tree planting and maintenance during the construction phase, including the responsibilities of the Contractor to maintain the saplings during the construction phase.

			the IEE.	
4	Safarov Abdurasul	Will the R39 have pedestrian pavements in urban areas?	Yes.	N/A
5	Safarov Abdurasul	Will new bridges be built or old ones rehabilitated?	This is really an engineering question. We understand that old bridges will be rehabilitated.	N/A
6	Begaliev Nurali	The new trees to be planted are unlikely to be the same type as the old trees and will not have the same benefits as the old ones.	The TDI will recommend locations and types of trees to be replanted. The types of trees should be suitable for the local environment.	**Section E.7.1** provides the procedures for tree planting and maintenance during the construction phase, including the responsibilities of the Contractor to maintain the saplings during the construction phase.
7	Rahimov Shuhrat	Dust emissions will be high on the road. How will these be managed?	The Contractor will be responsible for watering the road, and access routes on a regular basis to reduce dust impacts.	**Section E.6.1** provides mitigation measures for air quality, including the requirements for regular watering of roads during the construction phase.

272. Other questions and comments raised by the participants, which are not related to environmental issues, are not included in the table above.

Figure G.3: Consultation in Shahrizabz, 25th May, 2016

G.2 Planned Information Disclosure

273. It is anticipated that in compliance with ADB's requirements for IEEs (Category B environmental analyses), the document will be provided for disclosure on the ADB website and in UZB (in local language) prior to management review meeting for the Project.

286. The PMU will be responsible to notify and inform the public of construction operations prior to construction works, publish an emergency response plan disclosing his intentions to deal with accidents and emergencies, including environmental/public health emergencies associated with hazardous material spills and similar events, etc.

G.3 Grievance Mechanism

274. Complaints consideration procedures aim to provide an effective and systematic mechanism for the Project in responding to queries, feedbacks and complaints from affected persons, other key stakeholders and the general public.

G.3.1 Levels and Procedure for Grievance Redress

275. The Grievance Redress Mechanism (GRM) is available to people living or working in the areas impacted by the project activities. Any person impacted by or

concerned about the project activities has the right to participate in the GRM, should have the easy access to it, and be encouraged to use it. The proposed GRM does not replace the public mechanisms of complaint and conflict resolution envisaged by the legal system of the GoU, but attempts to minimize use of it to the extent possible.

276. Overall responsibility for timely implementation of GRM lies with the RFF through its PMU supported by the Engineer involved in managing and supervising the civil works, while the Contractor undertakes the actual civil works. Relevant Khokimyats, who are mandated by law to perform grievance redress related tasks, and mediators who are involved in facilitating amicable resolution of grievances are also included in GRM.

277. This GRM envisages two levels of grievance resolution for the road sector projects implemented under the supervision of the PMU: Grievance Redress Committees (GRC) at the local level and central (Tashkent) level. Local GRCs are usually composed of members nominated from the PMU, Khokimyats, Engineer & Contractor. GRCs at the central levels are chaired by the Heads responsible for the overall operation of GRM and its efficient and timely implementation, while the Coordinators are responsible for involving the relevant parties and coordinating the works of GRCs at regional/central levels.

GRM: Local Level

278. At the first stage, the resolution of grievance will be attempted through GRC at local level through the following steps.

279. *Grievance registration*: complainants or concerned individuals can visit, call or send a letter or e-mail or fax to the Khokimyat, the Contractor, the Engineer or the PMU. Receipt of grievances lodged in person, via phone, through a letter or e-mail or fax will be acknowledged. Grievances will be recorded in a standard format.

280. *Grievance processing*: Queries and complaints that are clarified and resolved at the intake point are closed immediately. Cases requiring further assessment and action are considered by the GRC at the local level. The GRC at the local level: (i) holds meetings on bi-monthly basis, however special ad hoc meetings can be arranged, as needed; and (ii) discusses the grievance case within ten working days and recommend its settlement to parties. The GRC Coordinator at the local level circulates relevant information among the members of GRC, prepares Minutes of GRC meeting and progress reports, and ensures that actions and decisions are properly documented.

281. *Feedback provision*: Receipt of grievances lodged in person or via phone will be acknowledged immediately. Receipt of grievances received through a letter or e-mail or will be acknowledged through a letter / e-mail / fax within 3 working days upon receipt by GRC coordinator at regional level.

282. If the grievance was resolved at the local level, the complaining party will be informed of the outcome. If grievance was not resolved at the local level and was passed to the GRC at the central level for consideration and resolution, appropriate information will be provided to the complaining party, including the date when the case was passed to GRC at the central level and the date by which the outcome at the central level is expected.

283. In case of anonymous complaints, the printed response will be posted at the information board of the relevant Khokimyat, so as the complaining party can approach and review the feedback.

GRM: Central Level

284. Following unsuccessful consideration of grievance by the GRC at the local level, complaint resolutions will be attempted at a central level through following steps.

285. *Grievance processing*: If grievance cannot be resolved by the GRC at the local level, it will be forwarded for consideration by the GRC at the central level, including all relevant documents. The GRC at central level: (i) holds meetings on monthly basis, however special ad hoc meetings can be arranged, as needed; and (ii) discusses the grievance case within twenty working days and recommend its settlement to parties. GRC Coordinator at central level circulates relevant information among the members of GRC, prepares Minutes of GRC meeting and progress reports, and ensures that actions and decisions are properly documented.

286. *Feedback provision*: If the grievance was resolved, the complaining party will be informed on the outcome of grievance resolution. If grievance was not resolved by the GRC at central level, appropriate information will be provided to the complaining party, including details why the case was not resolved, as well as recommendation to seek for resolution through the GoU legal system.

GRM: Legal System

287. If after the intervention and assistance from the GRCs at both local and central levels, no solution has been reached, and if the grievance redress system fails to satisfy the complaining parties, the case will be referred to the court for resolution in accordance with the GoU legislation.

288. In the meantime, it should also be emphasized that the GRM Guideline does not limit the right of the complaining party to submit the case to the court of law in the first stage of grievance process.

ADB Accountability Mechanism Policy, 2012

289. In addition to the GRM, the ADB has also developed itsAccountability Mechanism (AM) Policy. The AM provides a forum where people adversely affected by ADB-assisted projects can voice and seek solutions to their problems and report alleged noncompliance with ADB's operational policies and procedures. It consists of two separate but complementary functions: problem solving function and compliance review function. The objective of the Accountability Mechanism Policy 2012 is to be accountable to people for ADB-assisted projects as a last resort mechanism.

G.3.2 Disclosure of the Grievance Process

290. The complaints resolution process was and will continue to be disseminated through information brochures and posted to the Khokimyats. The grievance redress

mechanism will also be presented during informal meetings at Project area during the construction phase of the Project. The information of grievance resolution will be summarized in PMU progress reports to be submitted to ADB.

H. Conclusions and Recommendations

H.1 Conclusions

291. The IEE and its consultation process established that there were no significant environmental issues that could not be either totally prevented or adequately mitigated to levels acceptable to Uzbek and international standards. As such, based on the existing ADB Safeguards Policy (2009), this Project falls under ADB's **Category B**. The total estimate costs of the environmental mitigation and management to be funded by the ADB has been calculated at approximately $898,800, or approximately 0.3% of the total project cost of $266,193,2 00.

H.2 Recommendations

292. The EMP, its mitigation and monitoring programs, contained herewith shall be included within the Bidding documents for project works. The Bid documents should state that the Contractor shall be responsible for the implementation of the requirements of the EMP through his own SSEMPs which will adopt all of the conditions of the EMP and add site specific elements that are not currently known, such as the Contractors borrow pit locations. This ensures that all potential bidders are aware of the environmental requirements of the Project and its associated environmental costs.

293. The EMP and all its requirements shall then be added to the Contractors Contract, thereby making implementation of the EMP a legal requirement according to the Contract. He shall then prepare his SSEMPs which will be approved and monitored by the Engineer. Should the Engineer note any non-conformance with the SSEMP the Contractor can be held liable for breach of the contractual obligations of the EMP. To ensure compliance with the SSEMPs the Contractor should employ a national environmental specialist to monitor and report Project activities throughout the Project Construction phase.