

Initial Environmental Examination

TA 8068-KAZ
June 2012

KAZ: Central Asia Regional Economic Cooperation (CAREC) Corridor 3 (Shymkent-Tashkent Road) Rehabilitation Project (Road Section Km 705–742)

**Ministry of Transport and Communications (MOTC)
Republic of Kazakhstan**

**DRAFT
INITIAL ENVIRONMENTAL EXAMINATION
REPORT**

for

**TA-8068 (KAZ)
Central Asia Regional Economic Cooperation (CAREC)
Transport Corridor 3**

SHYMKENT - TASHKENT ROAD REHABILITATION PROJECT

ROAD SECTION KM 705 - 742

Prepared by

Madina Junussova, National Environmental Consultant

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List of Abbreviations

| | |
|----------------|--|
| ADB | Asian Development Bank |
| Akim | Head of Administration (region, district & settlement) in Kazakhstan |
| Akimat | Administration of the region, district or settlement in Kazakhstan |
| AP | Affected Person |
| BTB | Bituminous treated base |
| CAREC | Central Asia Regional Economic Cooperation Program |
| CFH | MOA's Committee of Forestry and Hunting |
| DESK | Department of Environment of South-Kazakhstan region |
| EEC | Environmental Expertise Committee |
| EIA | Environmental Impact Assessment |
| EMP | Environmental Management Plan |
| EBRD | European Bank for Reconstruction and Development |
| FS | Feasibility Study |
| GoK | Government of Kazakhstan |
| IEE | Initial Environmental Examination |
| IFI | International Financing Institution |
| IUCN | International Union for the Conservation of Nature |
| MOA | Ministry of Agriculture |
| MOEP | Ministry of Environmental Protection |
| MOH | Ministry of Health |
| MOTC | Ministry of Transport and Communication |
| NGO | Non-Governmental Organization |
| OVOS | Environmental Assessment conducted in accordance with Kazakhstan environmental legislation |
| PEIA | Preliminary Environmental Impact Assessment |
| PC | Public Consultation |
| RC | MOTC's Roads Committee |
| RoK | Republic of Kazakhstan |
| RoW | Right of Way |
| SanPiN | Sanitary Regulations and Standards (Ministry of Health) |
| SES | Sanitary and Epidemiological Services of MOH |
| SNiP RK | Construction Standards of the Republic of Kazakhstan |
| SPS | Safeguard Policy Statement, Asian Development Bank (2009) |
| SS EMP | Site-specific Environmental Management Plan |
| TSP | Total suspended particulate |

List of Measurements

| | |
|-------------------------|--|
| Ch km | Change kilometer |
| °C | Degree Celsius |
| dBA | Decibel (most common measure of sound) |
| ha | hectare |
| km | Kilometer |
| km² | Square kilometer |
| km/h | Km per hour |
| KZT | Kazakhstan Tenge (unit of currency) |
| m | Meter |
| m³ | Cubic meter |
| Mac | Maximum allowable concentration |
| mg/m³ | Milligram per cubic meter |
| m/s | Meters per second |

EXECUTIVE SUMMARY

1 Introduction

This Initial Environmental Examination (IEE) has been prepared for the proposed rehabilitation of the Shymkent-Tashkent Road to ensure good environmental practice and documented compliance with the requirements of the Asian Development Bank (ADB). This road section is a 37 km segment located between km 705 and km 742 of the Shymkent – Tashkent road, which is going to be financed by the ADB. The Project has been classified as Category B. i.e., a project requiring an IEE pursuant to ADB Safeguard Policy Statement 2009.

The Project Proponent is the Government of RoK, acting through its Ministry of Transport and Communications (MOTC) Roads Committee (RC) of the South Kazakhstan Oblast. The Project aims to contribute to regional cooperation and trade along CAREC Corridor 3 through rehabilitation of the road that connects Tashkent, the capital of Uzbekistan, and Shymkent, third largest city of Kazakhstan. The improvements of the whole Shymkent - Tashkent road section are being financed by two international financing institutions (IFIs): ADB and EBRD (European Bank for Reconstruction and Development). The 37-km road section begins from the Shymkent city bypass's end point, and passes through the territory of Shymkent and three districts of the South-Kazakhstan Oblast supported by ADB financing.

The projected traffic demands for Project Road Section at km 705 is about 32,000 vehicles per day in 2040 year that indicates a clear need to upgrade the highway to technical standards (SNiP RK 3.03-09-2006) for high speed roadways. Roads of this standard are considered to be warranted when calculated traffic in 20 years is estimated to be above 7,000 vehicles per day.

The objective of this IEE is to address the environmental impacts and management issues associated with the proposed road rehabilitation. The IEE report, which includes an Environmental Management Plan (EMP), addresses the needs of applicable laws and regulations of the Government of Kazakhstan including the provisions of the ADB Safeguard Policy Statement, June 2009.

The preparation of this IEE was undertaken through a desk study and field consultations with regional level representatives of GoK and local stakeholders. The IEE Study is based primarily on earlier Project documentation including national environmental impact assessment, field investigations of an ADB's consultant in April - June 2012, public consultation conducted in 24 May 2012 in Shymkent and informal consultations conducted in local villages: Rabat, Mambetov, Aktas and Akzhar in June 2012.

2 Description of the Environment

The Project Area is located within the major geomorphic regions, such as piedmont plains and mountains of Western Tien-Shan (Kazygurt Mountains). The city of Shymkent and Rabat village, closest settlements to the Project Road are situated within seismic area with seismic intensity of seven and eight on the Richter scale. No records of catastrophic earthquakes were registered in the relatively recent past. The Project documentation indicates that potential sources of quarried construction materials are situated in the immediate area.

The Project Road does not cross any rivers. The closest surface water sources to the starting point of the Project Road are the Badam River and Badam water reservoir.

The Project Area located within South-Kazakhstan region that can be characterized by sharply continental climate conditions. The number of foggy days is insignificant and more frequently happens in winter. Thunderstorms in the Project Area are registered year round, more frequently observed in summer.

The Project Area vegetation is represented by semi-savannahs multiyear and one-year grasses of the ephemeral type and ephemerals. There are no legally protected areas or rare/endangered species habitats found within or in the close vicinity to the Project Road.

Economic resources in the immediate vicinity of the Project Area are primarily those that support dry land farming, an irrigation network and the grazing potential of the area's pasturelands. No minerals are known to be exploited in the immediate Project Area. No industries or food processing facilities are known to exist in the Project Area.

There is very remote chance of finding any new sites of archaeological value in the Project Area as the alignment is completely within existing RoW with insignificant road widening.

3 Anticipated Environmental Impacts / Mitigation Measures and EMP

All potential positive and negative direct and indirect impacts on physical, biological, social and other valuable resources were considered in close consultation with the Design Engineers, developers of the national environmental assessment (OVOS) and in dialogue with a number of local stakeholders. As a result, it was found that there are no issues that cannot be addressed through standard mitigation measures.

Potential risks during the Pre-Construction Phase are related with low environmental management capacities of the Road Committee of South Kazakhstan Oblast. During this phase, a major instrument to prevent possible environmental and health impacts is the elaboration of a Site-Specific Environmental Management Plan (SS EMP). As this plan is required from each contractor, it is suggested to employ qualified experts who will assist the Contractors in fulfilling this task.

Much of the potential impacts relating to construction works are to be extensively addressed in each SS EMP. Some of the major potential impacts during this project phase, and the corresponding corrective measures, include: inclusion of public information and awareness campaigns at early work stage, provision for training courses, public awareness events and reporting of environmental damages; prevent hindrances and shortages for the general public utilities; specifications of permissive work hours for distinct construction activities; special consideration of precautionary measures while operating asphalt mixing plants, crushers, bitumen and concrete works, stockpiling of materials; specification of handling, transporting and storing hazardous materials; management options to avoid potential impacts on surface/ groundwater resource, local biodiversity and ecological resources (particularly in the vicinity of Badam forest of local importance and Kazygurt mountains); selecting sites for work camps, following the established guidelines and close consultation with local communities.

Addressing traffic safety is probably the chief concern of all parties involved, when this road will be completed. The IEE analyzes the main causes for high accident rates, and accordingly proposes a number of actions to curb this. Maintaining good road conditions, provision of good signage where needed, electronic warning tables, emergency phones, traffic controls and proper enforcement, surveillance of the driving licensing process, fencing off wild and domestic animals from the road, and regular awareness campaigns are considered the appropriate means of choice.

4 Conclusion and Recommendations

The benefits of the Shymkent – Tashkent Road Section Project justify its implementation, provided that the recommended mitigation actions are incorporated in its implementation. These benefits include a contribution to a more efficient transport network for use within the immediate Project Area and for use by regional, national and international traffic. Most of the potential impacts are temporary, mostly linked with the construction stage and can be mitigated as proposed in the EMP.

A. INTRODUCTION

A.1 Project Background and Objective of the Study

1. This Initial Environmental Examination (IEE) has been prepared for the proposed rehabilitation of the Shymkent-Tashkent Road to ensure good environmental practice and documented compliance with the requirements of the Asian Development Bank (ADB) reflected in the Safeguard Policy Statement. This road section is a 37 km segment located between km 705 (exact location according to the Design Documentation is km 705+621) and km 742 (km 742+804) of the Shymkent – Tashkent road, which is going to be financed by the ADB. The Project has been classified as Category B. i.e., a project requiring an IEE pursuant to ADB Safeguard Policy Statement.

2. The Project Proponent is the RoK, acting through its Ministry of Transport and Communications (MOTC), Committee for Roads (CR). The Project aims to contribute to regional cooperation and trade along CAREC Corridor 3 through rehabilitation the road that connects Tashkent, the capital of Uzbekistan, and Shymkent, third largest city in Kazakhstan (**Figure -1**). The improvements of the whole Shymkent - Tashkent road section are being financed by two international financing institutions (IFIs): ADB and EBRD (European Bank for Reconstruction and Development). The 37-km section begins from the Shymkent city bypass end point, and passes through the city of Shymkent and three districts of the South-Kazakhstan Region supported by ADB financing.

The objective of this IEE is to address the environmental impacts and management issues associated with the proposed road rehabilitation. The IEE Report, which includes an Environmental Management Plan (EMP), addresses the needs of applicable laws and regulations of the Government of Kazakhstan including the provisions of the ADB Safeguard Policy Statement, June 2009.

A.2 Methodology and Scope of the Study

3. This IEE covers the applicable national and ADB environmental requirements, description of baseline environmental conditions, environmental impacts associated with road rehabilitation, recommended mitigation measures and environmental monitoring program. The preparation of this IEE was undertaken through field consultations with regional level representatives of GoK and local stakeholders. The IEE is based primarily on earlier Project documentation and field investigations conducted by a local consultant in April - June 2012, public consultation conducted in 24 May 2012 in Shymkent and informal meetings conducted in local villages – Rabat, Mambetov, Akzhar and Aktas on 6 June 2012. The first detailed design on rehabilitation of Shymkent - Tashkent road, covering whole length and including considered part from km 705 - 742, was developed in 2004 by local Design Company KS-Engineering. First revision of the detailed design was done in 2007. The last version of the detailed design is being upgraded this year (2012) due to the recent changes in traffic volume.

4. This IEE considers only ADB part of the whole Shymkent – Tashkent rehabilitated highway. Another Environmental Assessment will be developed for the remaining road segment financed by EBRD. ADB and EBRD have fairly comparable environmental safeguard processes. EBRD as well as ADB use same environmental categorization system with IEE supporting category B projects. All of this makes harmonization of two Environmental Assessments easier.

5. The only significant difference is that the EBRD does not require consultation information disclosure, but simply recommends it and usually agrees with whatever the proponent's legal requirements is. Another issue is linked with difference in time and schedule given for development of two documents. This IEE is planned to be submitted by the end of June. The work on IEE report on the EBRD road section has been recently started and going to be finalized only in the middle of July 2012. Due to this fact it is proposed to implement a follow up harmonization approach in preparation of the IEE on the remaining EBRD section of the road. It means that some relevant parts of this IEE report (ADB) as EMP and outputs of public

consulting can be used as a base for further alignment of the second IEE report developed by EBRD consultant.

A.3 Study Area

6. The geographic boundaries are taken as 200 m on either side of the road due to the absence of any special environmental condition and presence of dominating terrestrial environment. There is no specific airshed or aquatic and acoustic environment, as well as no nationally significant or protected site, situated along the Project Road.

7. The starting point for the Project is located on the existing highway named A2, at the border of Shymkent city bypass end point, and passes through territory of the city of Shymkent and three administrative districts of the South-Kazakhstan Oblast: Tole bi, Sairam and Kazygurt.

8. The Project Road is a section of the shortest way from Shymkent to the Uzbekistan where rehabilitation is linked with modernisation of the existing 37-kilometer existing four-lane road meeting all applicable RoK technical standards.

9. The Project will require the dedication of 37 kilometres of right-of-way (ROW) and the areas for ancillary features such as bus stops and rest areas, and will require only land for temporary use for construction camps and related facilities. Its estimated cost is approximately US\$ 125 million.

10. On the average, the potential direct area of influence along the entire length of the Project Road is an estimated about 27.5 m width strip within the ROW. According to the construction norms of Kazakhstan (SNiP RK 3.03-09-2006) the width of right-of-way for road of the 1st technical category (different from environmental classification of ADB) may vary from 30 m to 70 m depending of inclination. However according to the information provided by Designer Company "KS Engineering" the width of right-of-way in the Project Road section is 62 m. This area is expected to be directly affected by reconstruction of road embankment and embankment slopes. The extended area of influence will include borrow areas and access roads, contraction camps, working and construction materials storage sites and watercourses in the vicinity.

Figure -1 CAREC transport corridor



Source: Drawn by ADB National Environmental Consultant based on materials of Central Asia Regional Economic Cooperation Program- www.carecprogram.org

B. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

11. The Project is required to comply with the environmental requirements of the RoK and the requirements of the financing organization, in this case the requirements of the ADB.

B.1 Kazakhstan Government Environmental Laws, Regulations and Guidelines

B.1.1 Environmental Impact Assessment and Ecological Expertise

12. Environmental protection is administered by the Ministry of Environmental Protection (MEP) in Kazakhstan. The Environmental Code was adopted in January 9, 2007 and is the basic legislative framework for environmental protection activity. The last edition available on the MEP web-site is dated to January 30, 2012. According to Article 36 of the Environmental Code development of OVOS (EIA) is obligatory for all types of activities that can have a direct or indirect impact on the environment or health of the people. The permitting system is a component of the Environmental Code.

13. The procedures ensure that projects are environmentally sound operate on three levels: Environmental Expertise Committee (EEC); Department of Environment of South-Kazakhstan region (DESK); Project Proponent (MOTC).

14. The EEC is located in the capital and has the first and last word on all national level EIAs. After the approval of a terms of reference (ToR) and the selection of a licensed Environmental Assessment (EA) specialist consultant, a preliminary environmental assessment (PEIA) (essentially a scoping-level desk study) is prepared in parallel with an engineering feasibility study.

15. The DESK reviews the PEIA and provides written comments to the EEC. If needed, specialists from within the Regional Department of Agriculture's Water Resources Committee and Forestry and Hunting Committee and from the Ministry of Health's Sanitary and Epidemiological Services (SES) are asked to contribute. The available documentation indicates that in practice this is rarely done. In principal, the EEC receives the comments and recommendations, reviews/edits them, and the preparation of an EIA is authorized. Following review and approval of the EIA, it is sent to the Executing Agency (EA) for action.

16. The Proponent Agency, in this case MOTC, is the third level. As the Proponent for the proposed action, it is responsible for required environmental actions and enforcement of the stipulations of the EIA prior to and during the Project's detailed design stage and for coordination of recommended environmental actions thereafter.

17. The consultant who prepares the PEIA (PredOVOS) usually undertakes the EIA (OVOS) and proceeds with the detailed analysis focusing on field work and primary data collection, with strict reference to Kazakhstan norms and codes. The focus of the EIA is the preparation of a comprehensive environmental mitigation and monitoring plan (EMP), in the past prepared separately and referred to as an Ecological Passport, but now included as a section of the EIA. Usually the EIA is prepared on the base of already available decisions undertaken by engineers and included in Detailed Design Study.

18. The EIA undergoes a similar review; first at the regional level and then by Ministry of Environmental Protection (MOEP) and any other agencies MOEP decides to include. Comments are reviewed, edited and assembled by the MOEP. This step takes up to 30 days, after which the EIA authors are required to defend the EIA at a consultation session with all stakeholders in attendance. During this period the public can comment on the EIA, but receive only one announcement in a local newspaper that the EIA is available for review. After EIA is complete, there is a public debate where the authors and the Proponent can answer questions from anyone. Once complete, the EIA is revised; a final document is prepared; and a certificate to proceed to the next stage is given to the proponent.

B.1.2 Other Environmental Legislation Relevant to the Project

19. The Water Code passed in July 2003 contains main directives on environmental protection, preservation and use of water resources on the territory of Kazakhstan. The last changes were integrated in February 12, 2009.

20. The main state document regulating land use and protection is the Land Code of the Republic of Kazakhstan that was adopted in June 20, 2003.

21. The Forest Code adopted in 2003 regulates the use, protection and conservation of forests as well as forest restoration. Specific issues related to the protection and conservation of forests, are regulated in by-laws: for instance, the 2002 governmental resolution on Measures of Haloxylon ammodendron tree conservation, the 2002 government resolution on Rules for compensation of damage to forestry and the 2001 government resolution on damage caused by illegal collection, logging, damage or destruction of plants in the Red Book, and the decision on Rules of forest safety. In 2004, the Parliament adopted a new version of the Forest Code.

22. The Law of the Republic of Kazakhstan 'On the road' dated 17 July 2001 laid the basic legal, economic and organizational principles of governance roads in the Republic of Kazakhstan and set their order. Article 2, Paragraph 2 of the Law «On the road» states that if international treaties ratified by the Republic of Kazakhstan launch other rules than those established by this Act the rules of the international treaties shall apply.

23. For the construction and maintenance of roads of common use, land users are provided with the land for a ROW on the basis of established norms, depending on the roads category and under the project documents. The size of the ROW for projected roads for common use is set depending on the category under the rules of allotment of land for roads of public use, namely: for roads of I technical categories - 35 meters from the roads axis, for roads of II technical categories - 20 meters, for roads of III technical categories - 15 meters, for roads of IV technical categories - 13 meters, for roads of V technical categories - 12 meters. Road's ROW lands are in the possession and use of road authorities or concessionaires, and are intended only for the development, improvement of roads and the establishment of road service. In the ROW of roads of common use is forbidden to carry out any kind of works or to place any buildings without the permission of the appropriate authorities.

24. The development of project documentation for the construction of new and rehabilitation of existing roads carried out in accordance with the Law «On the road» and the legal and technical documentation used in the design and construction of roads. The main construction standards are SNiP RK 3.03-09-06 "Roads" and CN RK 3.03-19-2006. Both represent standard technical documentation based on "Regulatory legal acts and engineering regulations in sphere of architecture, town planning and construction, effectual within the territory of the Republic of Kazakhstan".

25. The developed project documentation is adjusted and checked for compliance with all rules and requirements in the construction and design of roads with executive bodies in the roads and state construction committee.

B.1.3 Air and Soil Quality

26. Environmental Code defines the basic terms and principles of State control of air and soil conditions. In addition to the environmental legislation developed by MEP, Ministry of Health (MOH) of RoK establishes additional Sanitary Regulations and Standards (referred to as "SanPiN") aiming protection of human health.

27. Ambient air and soil quality standards are established by the last published SanPiN called "Sanitary and Epidemiological Requirements for Atmospheric Air in Urban and Rural Areas, Soils and Their Protection, Maintenance of the Territories of Urban and Rural Settlements, Working Conditions with Sources of Physical Impacts Affecting People" was introduced by the Decision Government of RoK, dated January 25, 2012.

28. This document contains the information on the MAC of the harmful substances in the air and soil provided in table -1 and table -2.

Table -1 Air quality standards

| Substance | Maximum Allowable Concentration, mg/m ³ | | Hazard Class |
|------------------|--|---------------|--------------|
| | One Time Maximum | Daily Average | |
| Inorganic dust | 0.3 | 0.1 | 3 |
| Nitrogen Dioxide | 0.2 | 0.04 | 2 |
| Sulphur Dioxide | - | 0.125 | 3 |
| Carbon Monoxide | 5.0 | 3 | 4 |

Source: "Sanitary and Epidemiological Requirements for Atmospheric Air in Urban and Rural Areas, Soils and Their Protection, Maintenance of the Territories of Urban and Rural Settlements, Working Conditions with Sources of Physical Impacts Affecting People", dated January 25, 2012

Table -2 Soil quality standards

| Substance | Maximum Allowable Concentration, mg/kg | Limiting Rate |
|--------------------------------|--|---|
| Manganese (gross form)* | 1500 | According to the General Sanitary Norms |
| Cupric (flexible form)* | 3.0 | According to the General Sanitary Norms |
| Lead (gross form) | 32.0 | Translocational |
| Zink (gross form)* | 23.0 | Translocational |
| Arsenic (gross form) | 2.0 | According to the General Sanitary Norms |

Source: "Sanitary and Epidemiological Requirements for Atmospheric Air in Urban and Rural Areas, Soils and Their Protection, Maintenance of the Territories of Urban and Rural Settlements, Working Conditions with Sources of Physical Impacts Affecting People", dated January 25, 2012

* due to the absence of these substances in new SanPiN data was taken from the previous document «Standards of the Maximum Allowable Concentrations of the Hazardous Substances, Harmful Microorganisms and Other Biological Materials Being the Soil Pollutants» approved by the Order of the Ministry of Health of the RoK №99 dd 30.01.2004 and Order of the Ministry for Environmental Protection of the RoK №21П dd 27.01.2004.

B.1.4 Noise

29. The sanitary rule regulating on noise level within settling areas is SanPiN of RoK № 3.01.035-97 «Maximum Allowable Noise Levels in Residential and Public Buildings and in Residential Areas».

30. The level of the road traffic noise is determined according to the norms of the SNiP (construction norms and rules) II-12-77 «Noise Protection». The limit of noise exposure

generated by the motor vehicles in the distance of two meters from the buildings faced to the noise sources in compliance with the SNiP II-12-77 is 70 dBA.

31. In addition to establishing acceptable standards, noise levels are generally regulated with respect to sound levels at specific places referred to as "sensitive receptors" such as schools, hospitals or, in the absence of such facilities, at residential buildings or a given distance from the source of the noise. No sensitive receptors potentially affected by either construction noise or operational noise were indicated or are known to exist in the Project Area.

B.2 Asian Development Bank (ADB) Environmental Policies and Guidelines

32. The Project has been classified as a Category B project under the provisions of the ADB's Safeguard Policy Statement (July 2009). ADB uses a classification system to reflect the significance of a project's potential environmental impacts. A project's category is determined by the category of its most environmentally sensitive component, including direct, indirect, cumulative, and induced impacts in the project's area of influence. This project is classified as category B due to the fact that its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects.

33. The scope of IEE, according to the ADB requirements, examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate or compensate for adverse impacts and improve environmental performance. An Environmental Management Plan detailing the mitigation measures, monitoring program, institutional strengthening and implementation, schedule and costs are also included in this IEE.

34. The IEE report will be presented to both the Government of Kazakhstan and ADB and shall serve as a background document for approval by the competent authority MOEP. The Project Proponent (MOTC) will have to make the draft IEE Report available in Kazakhstan at a public place accessible to project-affected groups and local NGOs. Once the IEE report has been locally disclosed and officially received by the ADB, the Bank will also make it available to the public before it begins formal appraisal of the project.

35. It is important to note that, to be meaningful, the recommendations of an IEE and the EMP must go beyond recommendations and become legally enforceable and incorporated in the bid and contract documents.

B.3 Administrative Framework

Project Area. The Project Road passes through four sub-administrative territorial units of South-Kazakhstan region, in particular:

- Section km 705 – km 713 (8 km) passes through Shymkent city;
- Section km 713 – km 728 (15 km) passes through Sairam district;
- Section km 728 – km 737 (9 km) passes through Tole bi district;
- Section km 737 – km 745 (8 km) passes through Kazygurt district.

36. The management and monitoring of environmental aspects of the proposed road rehabilitation project shall involve the following government agencies:

- (i) Road Committee under the MOTC is responsible for planning, constructing, operating and maintaining of national roads in Kazakhstan. The Project Implementation Unit (PIU) of the local sub-division of the Road Committee (RC) in South-Kazakhstan region will be in charge of project management to ensure that appropriate mitigation measures and monitoring programme and that the contract provisions are properly implemented. The RC of South-Kazakhstan region, as local level representative of the Project Proponent, responsible for coordination the IEE study, carry out required public consultations, ensure

implementation of the EMP and public disclosure of the IEE study. The RC shall also lease with relevant government offices for securing environmental approvals. During the operational phase of the Project, RC will undertake routine monitoring on road safety, the storm water drainage system, the condition of plantations, etc.

(ii) The district offices of RC in Sairam, Tole bi and Kazygurt districts will undertake day-to-day supervision of construction and oversight of the implementation of environmental management plans during project implementation.

(iii) Department of Environment of South-Kazakhstan region (DESK) shall be also responsible for routine monitoring of the project to determine compliance with environmental regulations and standards.

(iv) Sanitary and Epidemiological Services (SAS) of MOH in South-Kazakhstan region will undertake routine monitoring of the living conditions and sanitary provisions at the contractor's work camp and worksites. MOH's SAS shall be also involved in approving the contractor's work camp installations and facilities and their compliance with the relevant sanitary and health norms and guidelines.

C. DESCRIPTION OF THE PROJECT

C.1 Main Technical Features

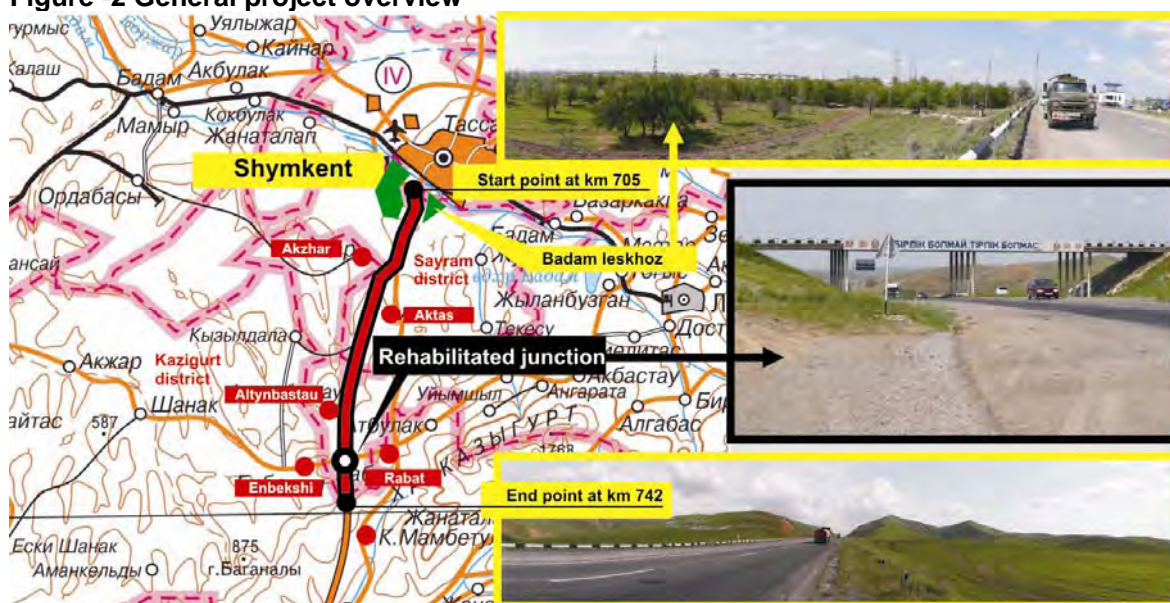
37. The main objective of the Project is to reduce road transport costs and improve access, transit and safety within Kazakhstan's North-South corridor, through the rehabilitation of the Project Road. For road users, the Project would lead to better road quality meeting mid-term traffic projections, better safety standards, lower travel costs and a shorter travel time.

38. The Project is aims at upgrading Shymkent – Tashkent Road Section existing four-lane highway, dual carriageway with a centre median for its entire length. Its start point at km 705 (exact location according to the Design Documentation is km 705+621) is the end of the Shymkent city bypass. Its end point at km 742 (exact location according to the Design Documentation is km 742+804) connects with the EBRD Road Section (km 742-804). The Project and its environs are illustrated by **Figure - 2, 3**.

39. The Project includes road surface rehabilitation works with saving of existing road alignment. The existing grade separated interchange will be replaced by a new one at km 732+963. The Project also includes rehabilitation of animal and agricultural machines passes, replacement of existing culverts and electricity lines.

40. The Kazygurt mountain pass road has a quite large gradient. As reported by Desinger Company's Chief Engineer, it is considered to change elevation of the road in this section of the rehabilitated road in order to decrease the existing maximal slope to at least 6%. However his words weren't supported by any adequate longitudinal profile of the road.

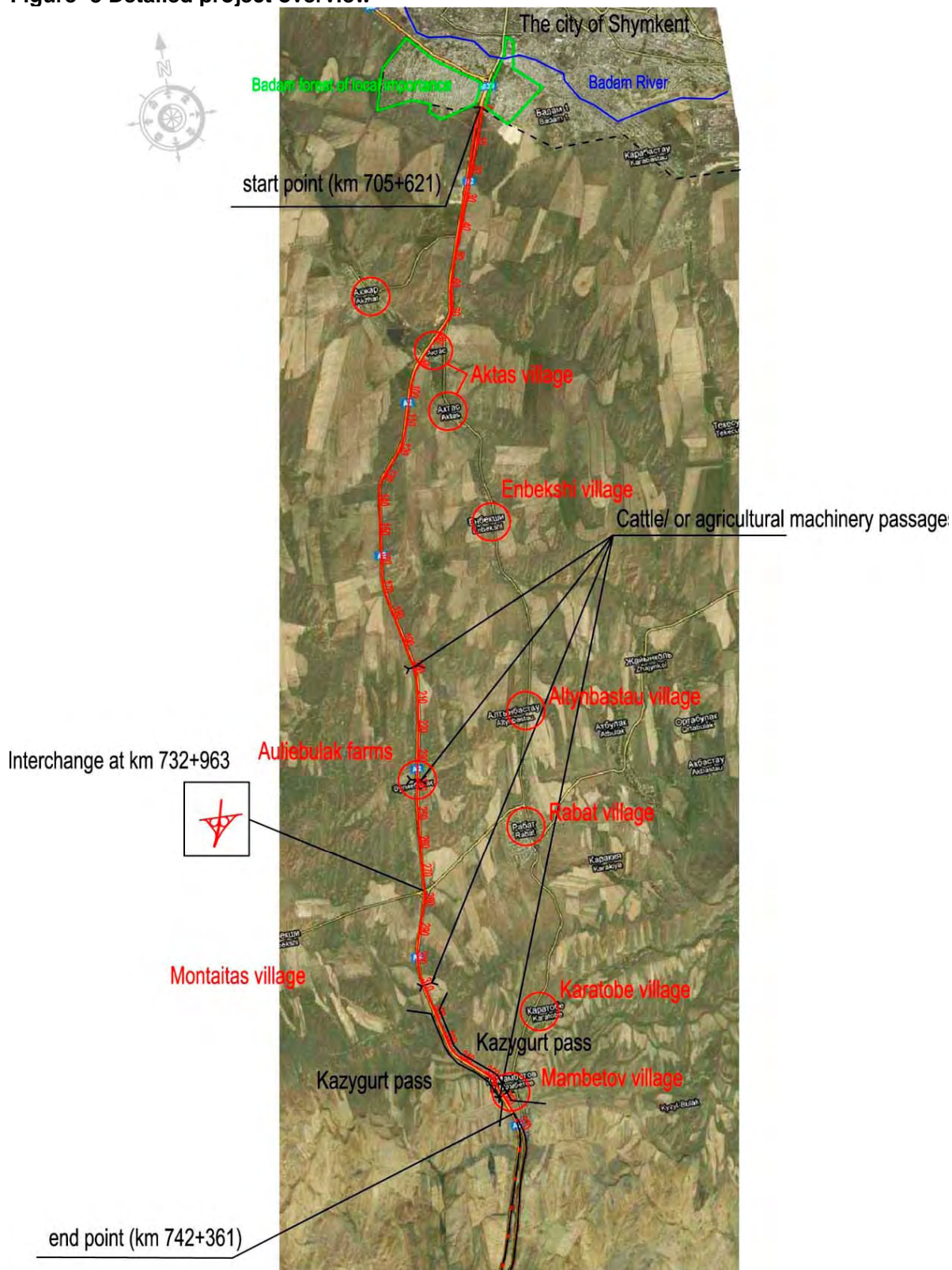
Figure -2 General project overview



Source: Drawn by ADB National Environmental Consultant based on field trip survey

41. **Appendix 1** provides the typical cross-sectional characteristics of the proposed upgraded roadway. In total seven cross-sections are designed, but they differ only in that portions meeting technical standards including a barrier incorporated in the design of the centre median. These profiles and the Project's other design and construction standards will conform to the standards of Kazakhstan Technical Category I-B (Kazakhstan SNiP RK 3.03-09-2006). All of the proposed works will be accommodated within the existing Right of Way (ROW), which varies from 30m to 70m. The main technical features are shown below in **Table -3**.

42. The Project will include the construction or rehabilitation of 36 culverts. Conditions of most of the roadway's existing culverts were found to be poor. The Project will replace all culverts.

Figure -3 Detailed project overview

Source: Drawn by ADB National Environmental Consultant based on Design documentation

43. A total of 1,621 trees located mostly within central separation lane are slated for removal for this road segment. According to the state forests' accountancy all trees situated along road serving as protection greenery within ROW are under responsibility of RC.

However all trees of South-Kazakhstan are under the management of the South-Kazakhstan region Territorial Office of the Committee of Forestry and Hunting (CFH). A program for essential tree cutting to implement the Project is planned to be developed with and approved by the South-Kazakhstan regional CFH close to the beginning of the construction works. All expenditures on removal of old and plantation of new trees, together with financial compensations going directly to the state budget, are included in the construction costs. In total 6,488 trees will be planted according to the information provided in the OVOS report.

Table -3 The main technical features of the road

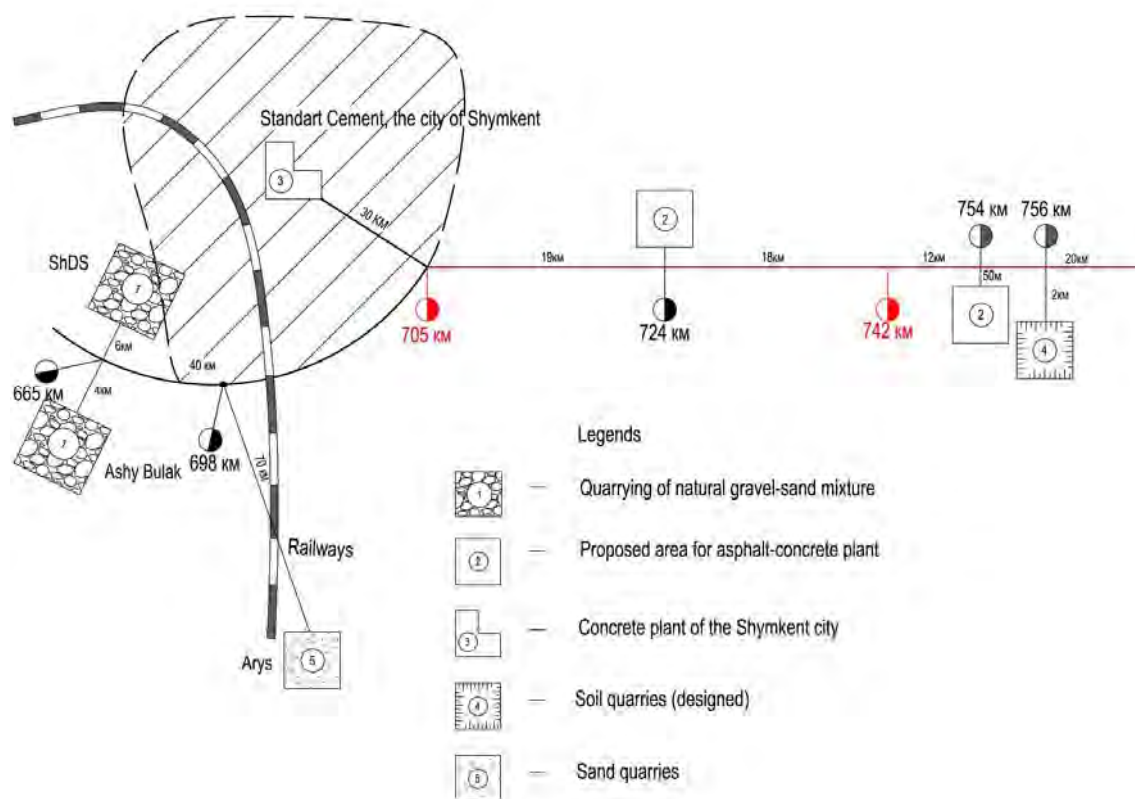
| Name of the road component | Size | Comment |
|--|------------------------|-------------------------------------|
| Total length of the Project Road | 37 km | |
| Number of lanes | 4 | |
| Highway width | 27.5 m | total |
| | 15 m | one-way |
| Central median | 5 m | |
| Maximum shoulder width | 3.75 m | |
| Cross-fall in the carriageway | 3% | |
| Design speeds | 150 km/h | for flat |
| | 100 km/h | for undulated terrain |
| | 60 km/h | for hilly terrain |
| Road surface | | concrete cement |
| Grade separated interchange | 1 | rehabilitation of existing one |
| Animal/agricultural machines crossings | 3 | rehabilitation of existing ones |
| Water culverts | 36 | replacement of existing ones |
| Electricity lines | 9 | replacement of existing ones |
| Bus stops | 6 | |
| Amount of excavation | 620.000 m ³ | mainly close to the Kazygurt bypass |
| Amount of fill | 230.000 m ³ | |

Source: Developed by ADB Environmental Consultant based on Design documentation

44. There are some potential sources of quarried construction material identified by the available Project documentation. Most of them are existing operations located out of the Project Road (**Figure - 4**). Transportation of the construction materials from four of the proposed sources will require passing through populated areas (the city of Shymkent).

45. Although the Project Road will be primarily concrete cement, it will use asphalt for various purposes including rehabilitation of adjacent local roads and the sub-base for the roadway. The available Project documentation proposes only one location for asphalt concrete plant within construction camp at km 724 (**Figure - 4**).

46. The Project Road section from km 705 to km 742 includes one construction camps are proposed to locate at km 724. The total area of a proposed construction camp is about 22.000 m².

Figure -4 Potential sources of quarried construction material

Source: Detailed Design documentations provided by local Designer Company KS-Engineering LLC

47. No specific location of storage areas is provided in the Design documentation. However as reported by Main Design Engineer of KS Engineering all of them will be placed within ROW.

48. The Project documentation indicates that water for construction might be taken from the Badam River passes through the city of Shymkent. No exact locations of water extraction from the rivers are identified. Nevertheless, possible sourcing places can be discovered close to the road are located within the Shymkent city in the vicinity of the settling area (**Figure -5**).

49. The drinking water for construction camps is planned to be drawn from the existing water supply system, possibly the city of Shymkent. No preliminary agreements with local authorities of the city are available in Design documentation and local EIA (OVOS).

50. There is no need of importing filling materials. If the amount of excavation ground is about 620.000 m³, the amount of required filling ground is just about 230.000 m³. All ground will be excavated while construction of the lower road near Kazygurt mountains that will be reused as fill material.

51. There are four existing cattle passages three of them are combined with agricultural machinery passes that represent well built concrete structures. All existing cattle (agricultural vehicles) crossings (**Figure -3** and **Table -4**) are planned to be replaced with preservation of their current geometric shape and technical features. The cross-section of rehabilitated cattle passage integrated with agricultural machinery passage is provided in **Appendix 1**.

52. There is an existing grade separated interchange that is going to be demolished and to be replaced by a new one at km 732+963.

53. The Project considers rehabilitation of four existing rest areas, which includes replacement and re-planning of the existing surface. The project includes installation of 6 bus stops supplied with shelters. The width of the bus stop sites is 3.75 m, and length is 13m. Stopping areas of the bus stops are separated from the roadway by a dividing strip of 0.75 m in width. According to the Designer Company KS Engineering all bus stops and rest areas are equipped with toilets.

Figure -5 Photo of the Badam river within the city of Shymkent



Source: Photo taken by ADB Environmental Consultant during the field survey

Table -4 Cattle crossings locations

| Project km | Size | Comment |
|--|-----------------------------|-------------|
| 725+600 Animal/agricultural vehicles crossing | Rectangular tube 6m*4.5m | Replacement |
| 729+400 Animal/agricultural vehicles crossing | Rectangular tube 6m*4.5m | Replacement |
| 735+700 Animal crossing | Rectangular tube 4m*2.5m | Replacement |
| 741+100 Animal/agricultural vehicles crossing | Rectangular tube 6m*4.5m | Replacement |

Source: Developed by ADB National Environmental Consultant based on Design documentation

C.2 Traffic Forecast

54. Project Road section is a part of the CAREC 3 transit corridor linking Western and Northern countries of Eurasian continent with South and Central Asia through the territory of Kazakhstan. The projected traffic demands for Project Road Section at km 705 forecasted by Designer Engineers is about 23.000 vehicles per day in 2040 year. Roads of this standard are considered to be warranted when calculated traffic in 20 years is estimated to be above 7,000 vehicles per day.

D. ANALYSIS OF ALTERNATIVES

55. The designs under consideration by the DEs were based on the findings of the previous feasibility study, which considered the option without project and the upgrade highway option. Then the design engineers developed the Project components based on the feasibility study, and they were not therefore required to consider alternative alignments.

56. Given the infrastructure setting and enormous distances covered by the CAREC transport corridor, as well as traffic patterns and limited connectivity, a feasibility study prepared by the RoK rejected the other transport modes as they appeared uneconomic. Road corridor development was given preference over the expansion and rehabilitation of the railway network because roads are judged to be more cost efficient; faster to construct; serve local demands more flexibly; and are ultimately less complicated. Rail gage standards are not compatible among East Asian, Central Asian, Iranian and Central European systems, thus incurring much handling and processing of cargo. The railway alternative was also rejected due to the low quality of actual services and elevated risks for food cargo.

D.1 "No-Project" Option

57. Without the Project, the road would continue to be somewhat of a logistic obstacle to road transport form along the CAREC 3 corridor and the economic benefits to Kazakhstan and surrounding economies (Uzbekistan) would not be realized. Many sections of the road have some parts where the wearing course is damaged. This condition adversely affects traffic safety and reduces vehicle speeds, as well as being an impediment to safe overtaking of slower vehicles. In general, the environmental conditions along the road would continue as present. The measures foreseen for environmental mitigation and increased traffic safety as per design of the project, such as improved run-off management and control, noise screens, dust control, safer cattle and agricultural machines passes and speed control measures would not, or to a much lesser extent be realized.

58. The option of "No-Project" has been considered and found to be neither reasonable nor prudent in light of the Transport Policy Framework and the Transport Strategy developed by the Republic of Kazakhstan to improve and expand the network over the short to medium term.

59. Improvement of Shymkent - Tashkent Road Section is an important element within this overall Transport Strategy which has identified the goal of making the road system larger, better, more accessible, more affordable, more efficient, safer, and more environmentally friendly. The Transport Strategy established a program which identifies priority investments such as the improvements to Shymkent - Tashkent Road Section and failure to improve the road section could seriously undermine the financial underpinnings of this program. As also noted in the introductory section, Shymkent - Tashkent Road Section is an important element of the transport corridor CAREC 3, facilitating traffic and international trade between Russian Federation and South Asia and Middle East countries.

60. The "No-Project" case might cause transportation delays, increase of road congestions and accidents, road side environmental pollution and other negative impacts linked with lack of the existing road technical capacities to carry out growing traffic pressure. At the end all of these might lead to the extra expenses and increase of the road transportation costs though the territory of Kazakhstan.

D.2 Design Alternatives

61. The terminal points of the Road Section km 705-742 are established by the road network to which the Road Section will connect. Main technical need to upgrade the roadway to technical standards (SNiP RK 3.03-09-2006) for highways. Major components of the design, particularly the accommodation of animal and farm equipment crossings at strategic points are sound mitigation actions to lessen public and animal safety issues.

62. Cement-concrete with bituminous treated base (Btb) meeting Kazakhstan technical standards was selected as the road surface in accordance with the technical design project

which identified the need for rigid pavement with enhanced heavy-duty road surfacing. The selection was made based on: (i) lower construction and transport costs; and (ii) better adaptability to the sometimes harsh local winter conditions, thus reducing repair and maintenance costs.

E. DESCRIPTION OF THE ENVIRONMENT (BASELINE DATA)

E.1 Ecological Environment

E.1.1 Fauna

63. Overview. Most of the indigenous mammals found in the Kazakh Steppe burrow, live in colonies, or migrate. Those typically found include numerous rodents such as ground squirrels (*Citellus*), hamsters (*Cricetus*, *Cricetulus*, *Podopus*), voles (*Microtus*), birch mice (*Sicista*), lemmings (*Lagurus*), marmots (*Marmota bobac*); and lagomorphs such as pikas (*Ochotona*) and hares (*Lepus*). Wolf (*Canis lupus*), foxes (*Vulpes vulpes*, *V. corsac*) and Siberian polecat (*Mustela eversmanni*) are typical steppe carnivores. More detailed information on popular animals and birds types in the region is provided in **Table -5** and **Table -6**.

Table -5 Animal species registered in the South-Kazakhstan region

| Years | Main types of the animals | | | | | | | | | |
|-------|---------------------------|------------------------|-----------|--------|------|--------|------|------------|---------|--------|
| | Siberian Roe Deer | Siberian mountain goat | Wild boar | Jackal | Fox | Corsac | Wolf | Tolai hare | Muskrat | Badger |
| | In numbers | | | | | | | | | |
| 2005 | 269 | 1949 | 1038 | 655 | 5300 | 298 | 471 | 11000 | 8338 | 2417 |
| 2010 | 305 | 2034 | 1419 | 808 | 5763 | 362 | 955 | 9624 | 10136 | 2370 |

Source: Data provided by CFH of South-Kazakhstan region

Table -6 Bird species registered in the South-Kazakhstan region

| Years | Main types of the birds | | | | | | | |
|-------|-------------------------|--------|--------|--------|--------|--------|--------|-----------|
| | Pheasant | Gooses | Ducks | Coot | Pigeon | Quail | Chukar | Partridge |
| | In numbers | | | | | | | |
| 2005 | 14470 | 50125 | 175354 | 218250 | 27500 | 214750 | 20400 | 50250 |
| 2010 | 29215 | 62894 | 209170 | 162783 | 46156 | 217219 | 24271 | 50134 |

Source: Data provided by CFH of South-Kazakhstan region

64. Project Area. There are no endangered species habitats found within or in the close vicinity to the Project Road. The most popular animals inhabiting the Project Area are rodents: squirrels, jerboas and field mice. Among the insectivores there are hedgehogs, shrews, also reptiles like lizards and snakes. However there are very few in numbers mostly due to the intensive agricultural developments situated along the existing road for a long time. The most common livestock species are cattle and sheep.

65. The only few types among rare species of insects like *Satanas gigas* and *Sphex flavipennis* listed in the "Red Book" of Kazakhstan are registered in the Project Area. No places of permanent nesting and wild animals' habitats were discovered adjacent to the road.

66. The Badam River and small Akzhar Lake are locally popular fishing places situated close to the Project Road. As reported by South-Kazakhstan region CFH the rivers and Akzhar lake contains long-horned beetles, a large marinkas, carp, catfish and other river species. However, these resources are not significant enough to have commercial value and are used mostly for amateur fishery.

E.1.2 Flora (Vegetation and Plant Species)

67. Project Area. The Project Area vegetation represented by semi-savannahs multiyear and one-year grasses of the ephemeral type (*Poa Bulbosa*, *Carex* etc.) and ephemerals (*Bromus tectorum*, *Bromus Japanese*, *Aegilops* etc.). There is significant presence of bluegrass, mustard and stickseed. Among rarely distributed species are ferula types. There are also meadow species like wheat grass, yarrow, licorice, etc. The average density of grass stand is just about 50-60%. The average height of the grass stand is 20-25 cm.

68. Most of the lands along the road are used for crop production and livestock breeding. Among cultivated plants there are wheat, alfalfa, safflower, corn, cotton, melons and gourds.

The most frequently appearing weeds in the area are *Picris*, *Sorghum halepense*, *Convolvulus*, *Cynodon*, *Phragmites*.

69. There are no natural forest lands along the entire ROW. As the Project Road passes within the old alignment no serious impacts on vegetation and plant species growing near the existing road are expected. The forest plantations located almost along the existing road are generally at a distance of 10-40 meters (more than 50 meter near Badam leskhoz at the starting point of the road alignment). There are also some trees located in the central green road separation area and along two sides of the road within the ROW. These trees fall under the management of the South-Kazakhstan regional territorial office of the Committee of Forestry and Hunting (CFH). The most popular and adopted to local climatic conditions among existing types of trees is elm.

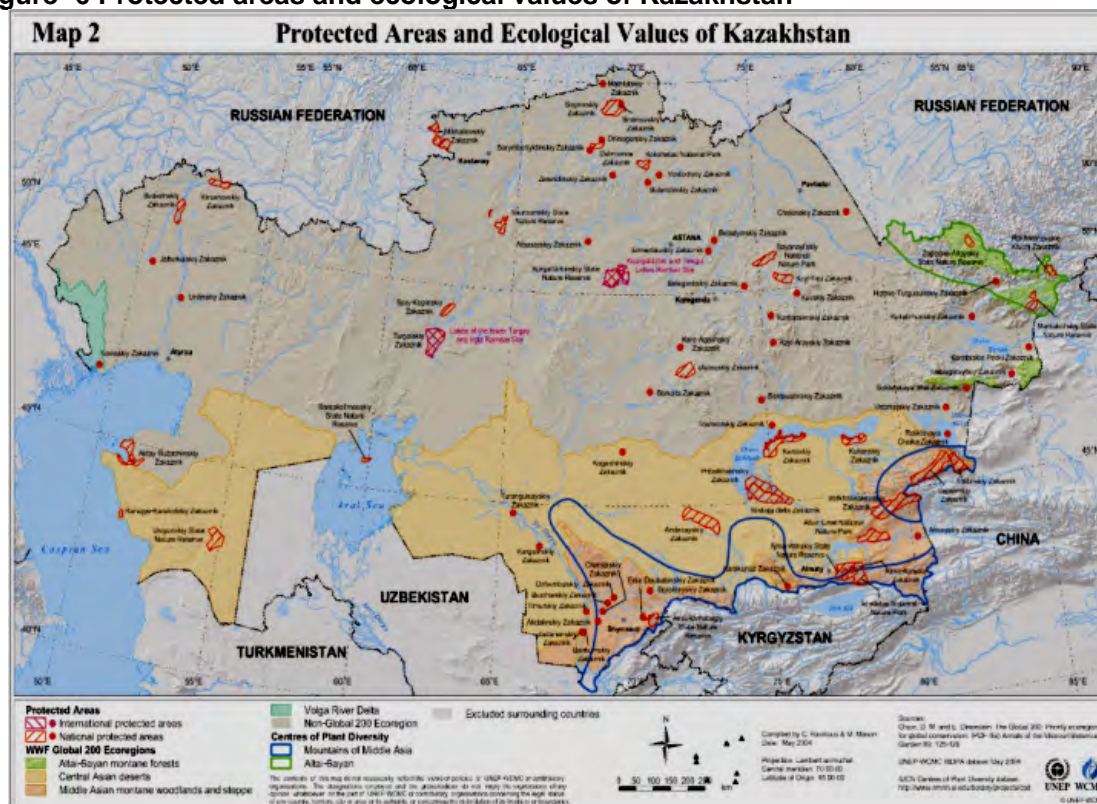
E.1.3 Sensitive Habitats & Protected Areas

70. Overview. IUCN indicates that the Project Area is within the area delineated as the "Mountains of Middle Asia Centre of Plant Diversity" and one of the WWF Global 200 Ecoregions as illustrated by **Figure -6**. The designation offers no legal protection, but is indicative of the relative importance of the area.

71. Project Area. There are no legally protected areas or rare/endangered species habitats found within or in the close vicinity to the Project Road. As reported by the head of the South-Kazakhstan region CFH the closest protected area is reported to be more than 50 km distant.

72. However there is forest of local importance serving as a city protecting shelter called Badam leskhoz. There are some fruit trees like apple, apricot and pear trees are growing on the territory of Badam leskhoz. No trees belonging to the Badam leskhoz are going to be cut or impacted due to the large distance from the road (more than 50 m), as reported by Designer Company KS Engineering and approved by CFH of South-Kazakhstan region.

Figure -6 Protected areas and ecological values of Kazakhstan



Source: UNEP – Program of Preservation of Natural Habitat in Kazakhstan

E.2 Physical Environment

E.2.1 Geologic Characteristics & Resources

Overview. The South-Kazakhstan region is located within major geomorphic regions, such as piedmont plains and mountains of Western Tien-Shan. Project Area. The Sairam district territory is located within the piedmont plains and the surface slopes from southeast to northwest. The main elements of the relief are undulating low hills and depressions. The hills have a rounded shape and their slopes facing in different directions with the height ranges from 10-20 meters and more. The steepness of the slopes is different and varies from flat to gently rolling. The Kazygurt district represents smaller part of the Project Area with low mountains and ridges, like Kazygurt Mountains that appear right after the end point of the Project Road.

73. Given these geological conditions and as evidenced by history, the Project Area is seismically active. Earthquakes with magnitudes of six-eight points on the Richter scale are possible there according to the local normative document SNiP RK 2.03-30-2006 "Construction in seismic regions". The city of Shymkent and Rabat village, closest settlements to the Project Road are situated within seismic area with seismic intensity of seven and eight on the Richter scale. However there were no records of catastrophic earthquakes registered in the relatively recent past.

74. Overview. The South-Kazakhstan region is rich in mineral resources. There are deposits of polymetallic ores, which are located on the western slope of the Karatau ridge. The construction materials like limestone and dolomite for lime and cement, silica sand, refractory, ceramic and bentonite clays, mineral paints, sand and gravel are available within the region. There are also deposits of phosphates, marble, stone cladding, fluxing materials, jewellery and ornamental stone, lead and gold. Project Area. The Project documentation indicates that potential sources of quarried construction materials in the immediate area have been identified as follows:

- ShDS is existing quarry for natural gravel and sand mixture located at km 665 6 km on the right (north) about 46 km away from the start point (km 705) of the Project Road with the access via existing the Shymkent city bypassing road;
- Ashy Bulak is existing quarry for natural gravel and sand mixture located at km 665 4 km on the left (south) about 44 km away from the start point (km 705) of the Project Road with the access via existing the Shymkent city bypassing road;
- Arys sand quarry located at km 698 70 km on the left (south) on the west from the start point (km 705) of the Project Road with the access via existing the Shymkent city bypassing road.

75. Project Area. The northern part of the Shymkent city is crossed by the Badam river valley. Maximum altitude of the Project Area within Sairam district is 939 meters. The minimum altitude is 382 m at the edge of the watercourse Shubursu on southwest of the district. The northern part of the Kazygurt district is formed by watershed ridges of Kazygurt and Karzhantau. Maximum altitude within the Kazygurt district is 3615 m. The topographic, climatic and soil conditions (discussed below) are such that most of the lands along the Road Section km 705-742 ROW are used for agricultural, including use as pastures and crop production.

E.2.2 Soil Characteristics

76. Dominant soils existing within the Project Area are:

The submontane brown soils are met as the separate solid masses on the high submontane plains. They are formed under the coarse-grained ephemerides (bulbous barley, Agropyron villosus) with marked additions of the common mesophilous cereals (cocksfoot) and savanna-like tall grasses.

The submontane gray-brown soils are frequently met in the upper belt of the submontane plains. They were formed under the coarse-grained ephemerides vegetation (Agropyron villosus, bulbous barley) and savanna-like tall grasses. The soil materials are represented by the heavy loess loams mostly. The gray-brown soils have the middle or deep thickness of the humid horizons.

The submontane common gray soils and light, northern serozems are widely spread on the submontane, partly foothill plains. The common gray soils occupy the upper, well watered belt of the gray soil zone; the light serozems occupy the lower belt. On the submontane plains the soil materials for them are the loess loams, on the foothill plains – the binomial loamy-cobble (pebble) alluvial-proluvial and deluvial- proluvial drifts. The deluvial-proluvial drifts are the pebble or cobble-loamy on the top and are underlain with the pebble or cobble.

E.2.3 Soil Quality

77. The baseline environmental examination of the Kazakhstan environmental team included sampling of soils (OVOS). Environmental examination was implemented in 38 points at every 1 km along the Project Road. Chemical components covered by the study include 5 main substances: copper, zinc, lead, manganese, and arsenic.

78. Heavy metal concentrations in soils are shown in **Table -7**. Results indicate that for each sampling location. The highest concentrations of lead were obtained at km 705 (22.9 mg/kg) in the vicinity of the city of Shymkent with operating petrol stations along the road; at km 714 (25.2 mg/kg) and at km 722 (23.4 mg/kg) both situated close to the half-damaged irrigation channels. Nevertheless, concentrations of lead in soil at all sampling locations did not exceed the MAC accepted in Kazakhstan maximum limit of 32 mg/kg for soils, although may still pose risks to human being as well as the environment.

Table -7 Results of soil sampling along the Project Road compared with approved MAC in soils according to the local standards

| Sampling points along the road (km) | Main pollutants mg/kg | | | | | | | | | |
|-------------------------------------|------------------------|-----|-------------------|------|-------------------|------|------------------------|------|----------------------|-----|
| | Cupric (flexible form) | | Zink (gross form) | | Lead (gross form) | | Manganese (gross form) | | Arsenic (gross form) | |
| | Test results | MAC | Test results | MAC | Test results | MAC | Test results | MAC | Test results | MAC |
| 705 | 0.042 | 3.0 | 0.09 | 23.0 | 22.9 | 32.0 | 496 | 1500 | <1.0 | 2.0 |
| 706 | 0.038 | 3.0 | 0.085 | 23.0 | 21.4 | 32.0 | 493 | 1500 | <1.0 | 2.0 |
| 707 | 0.034 | 3.0 | 0.091 | 23.0 | 19.6 | 32.0 | 476 | 1500 | <1.0 | 2.0 |
| 708 | 0.029 | 3.0 | 0.082 | 23.0 | 18.9 | 32.0 | 482 | 1500 | <1.0 | 2.0 |
| 709 | 0.022 | 3.0 | 0.091 | 23.0 | 14.7 | 32.0 | 387 | 1500 | <1.0 | 2.0 |
| 710 | 0.027 | 3.0 | 0.08 | 23.0 | 16.7 | 32.0 | 405 | 1500 | <1.0 | 2.0 |
| 711 | 0.024 | 3.0 | 0.061 | 23.0 | 16.2 | 32.0 | 410 | 1500 | <1.0 | 2.0 |
| 712 | 0.026 | 3.0 | 0.066 | 23.0 | 17.1 | 32.0 | 442 | 1500 | <1.0 | 2.0 |
| 713 | 0.029 | 3.0 | 0.087 | 23.0 | 16.1 | 32.0 | 391 | 1500 | <1.0 | 2.0 |
| 714 | 0.033 | 3.0 | 0.09 | 23.0 | 25.2 | 32.0 | 399 | 1500 | <1.0 | 2.0 |
| 715 | 0.026 | 3.0 | 0.084 | 23.0 | 21.1 | 32.0 | 378 | 1500 | <1.0 | 2.0 |
| 716 | 0.031 | 3.0 | 0.088 | 23.0 | 22.4 | 32.0 | 420 | 1500 | <1.0 | 2.0 |
| 717 | 0.036 | 3.0 | 0.068 | 23.0 | 22.9 | 32.0 | 468 | 1500 | <1.0 | 2.0 |
| 718 | 0.03 | 3.0 | 0.074 | 23.0 | 20.7 | 32.0 | 413 | 1500 | <1.0 | 2.0 |
| 719 | 0.027 | 3.0 | 0.062 | 23.0 | 20.5 | 32.0 | 433 | 1500 | <1.0 | 2.0 |
| 720 | 0.032 | 3.0 | 0.068 | 23.0 | 17.8 | 32.0 | 448 | 1500 | <1.0 | 2.0 |
| 721 | 0.027 | 3.0 | 0.061 | 23.0 | 15.2 | 32.0 | 396 | 1500 | <1.0 | 2.0 |
| 722 | 0.032 | 3.0 | 0.092 | 23.0 | 23.4 | 32.0 | 359 | 1500 | <1.0 | 2.0 |
| 723 | 0.026 | 3.0 | 0.077 | 23.0 | 12.4 | 32.0 | 396 | 1500 | <1.0 | 2.0 |
| 724 | 0.034 | 3.0 | 0.079 | 23.0 | 16.2 | 32.0 | 423 | 1500 | <1.0 | 2.0 |
| 725 | 0.028 | 3.0 | 0.064 | 23.0 | 16.8 | 32.0 | 399 | 1500 | <1.0 | 2.0 |
| 726 | 0.028 | 3.0 | 0.071 | 23.0 | 17.8 | 32.0 | 432 | 1500 | <1.0 | 2.0 |
| 727 | 0.03 | 3.0 | 0.065 | 23.0 | 17.5 | 32.0 | 420 | 1500 | <1.0 | 2.0 |
| 728 | 0.034 | 3.0 | 0.063 | 23.0 | 18.6 | 32.0 | 413 | 1500 | <1.0 | 2.0 |
| 729 | 0.02 | 3.0 | 0.093 | 23.0 | 13.2 | 32.0 | 363 | 1500 | <1.0 | 2.0 |
| 730 | 0.029 | 3.0 | 0.089 | 23.0 | 15.4 | 32.0 | 419 | 1500 | <1.0 | 2.0 |
| 731 | 0.022 | 3.0 | 0.083 | 23.0 | 13.3 | 32.0 | 386 | 1500 | <1.0 | 2.0 |
| 732 | 0.031 | 3.0 | 0.085 | 23.0 | 14.4 | 32.0 | 401 | 1500 | <1.0 | 2.0 |
| 733 | 0.029 | 3.0 | 0.08 | 23.0 | 12.9 | 32.0 | 488 | 1500 | <1.0 | 2.0 |
| 734 | 0.034 | 3.0 | 0.059 | 23.0 | 17.3 | 32.0 | 483 | 1500 | <1.0 | 2.0 |
| 735 | 0.027 | 3.0 | 0.052 | 23.0 | 14.3 | 32.0 | 441 | 1500 | <1.0 | 2.0 |
| 736 | 0.037 | 3.0 | 0.057 | 23.0 | 13.5 | 32.0 | 490 | 1500 | <1.0 | 2.0 |
| 737 | 0.028 | 3.0 | 0.094 | 23.0 | 11.6 | 32.0 | 396 | 1500 | <1.0 | 2.0 |
| 738 | 0.032 | 3.0 | 0.089 | 23.0 | 11.4 | 32.0 | 422 | 1500 | <1.0 | 2.0 |
| 739 | 0.024 | 3.0 | 0.091 | 23.0 | 11.5 | 32.0 | 390 | 1500 | <1.0 | 2.0 |
| 740 | 0.045 | 3.0 | 0.062 | 23.0 | 15.9 | 32.0 | 482 | 1500 | <1.0 | 2.0 |

| Sampling points along the road (km) | Main pollutants mg/kg | | | | | | | | | |
|-------------------------------------|------------------------|-----|-------------------|------|-------------------|------|------------------------|------|----------------------|-----|
| | Cupric (flexible form) | | Zink (gross form) | | Lead (gross form) | | Manganese (gross form) | | Arsenic (gross form) | |
| | Test results | MAC | Test results | MAC | Test results | MAC | Test results | MAC | Test results | MAC |
| 741 | 0.04 | 3.0 | 0.040 | 23.0 | 12.7 | 32.0 | 401 | 1500 | <1.0 | 2.0 |
| 742 | 0.031 | 3.0 | 0.031 | 23.0 | 13.7 | 32.0 | 433 | 1500 | <1.0 | 2.0 |

Source: OVOS. Data on MAC was taken from "Sanitary and Epidemiological Requirements for Atmospheric Air in Urban and Rural Areas, Soils and Their Protection, Maintenance of the Territories of Urban and Rural Settlements, Working Conditions with Sources of Physical Impacts Affecting People", dated January 25, 2012

79. The highest concentrations of 0.042 mg/kg and 0.045 mg/kg for copper (flexible form) were obtained at sampling point at km 705 and km 740 respectively located close to the electricity lines; the lowest concentration was 0.2 mg/kg at km 729, with most of samples not exceeding the MAC limit of 3 mg/kg. The concentrations of other sampled contaminants like zink, manganese and arsenic are also within accepted limits of Kazakhstan standards for soils.

E.2.4 Hydrology

80. Overview. Hydrographical network on the territory of South Kazakhstan is distributed unevenly. River network is more developed in the mountainous part of the territory. On the plains it appears weak and is mostly represented by transit rivers and temporary waterways. The Syrdarya River, the basin of which includes all other rivers, occupies the central place in the hydrography of this area. The Syrdarya River has inflows only on the right side which begin in the Western Tien Shan ridges. The largest of them which reach the Syrdarya River is the Chirchik River (with inflows Chatkal, Pskem, and Ugam), Keles and Arys (with inflows Borolday and Badam). The main source of supply for all rivers of South Kazakhstan, including the underground waters, is the water from melted snow and rain water, volume of which does determine the volume of the annual flow.

81. Project Area. The Project Road does not cross any river. However, the closest surface water sources to the starting point of the Project Road are the River Badam (2 km from the start point of the Project Road), River Keles (about 16 km from the end point of the Project Road) and Badam water reservoir (about 20 km from the Project Road). The Badam River is a left tributary of the Arys River and originates from the slopes of the Badam mountains. There are two water reservoirs in the basin of the river. The water from the Badam River serves as a source for irrigation and domestic needs. Pollution of the river is mostly due to run-offs of river valleys, farmlands, abandoned cattle farms and some industrial sites. The Badam water reservoir was built in 1974 for irrigation purposes its usable capacity is 61.5 million cubic meters. Currently Badam water reservoir is used for irrigation of more than 90 thousand hectares of fields. Situated within the Project Area Irrigation network is in the form of canals and aryks (irrigation ditch).

E.2.5 Water Quality

82. Project Area. Surface waters in the Project Area are reported to be monitored by local agencies (Aral-Syrdarya Water Basin Management Unit and Sanitary-Epidemiological Unit of South-Kazakhstan region) that provided the following information about the Badam river contamination. According to the last data on the results of chemical analysis measured by two hydro-stations, located in the city of Shymkent and Karaspan village, the main identified pollutants are sulphates, nitrates, copper and magnesium.

E.2.6 Groundwater

83. Overview. The Republic of Kazakhstan is reportedly rich enough in groundwater to fully satisfy the population with domestic, potable, technical and other waters in accordance with the needs of the population, industry and agriculture - but its distribution is extremely uneven. Quality and reserves of ground water vary considerably. Roughly half of the groundwater resources are concentrated in the south.

84. Groundwater is mainly belongs to the subterranean waters of the quaternary alluvial sediments. The thickness of the alluvial sediments varies within the range of 7 - 24 m. Depending

on the lithological composition of the water saturated formations the discharge rates of wells vary within the range from 1-2 to 10-15 dm³/s. The greatest discharge rates are typical for the formations bedded by the gravelly pebble stone; the lowest discharge rates characterize the sandy deposits. The waters are the alluvial sulphate-hydrocarbonate sodium with 1 g/dm³ salinity.

E.2.7 Air Quality

85. The baseline environmental examination of the Kazakhstan environmental team included air sampling (OVOS). Environmental examination was implemented in 20 points located in 20 meters distance from the road axis at every 2 km along the Project Road in the vicinity of the settling areas. Chemical components covered by the study include 4 main substances: dust, nitrogen dioxide, sulphur dioxide and carbon monoxide.

86. The results of the air examination are provided in **Table -8**. There is a high dust pollution along the road with the highest concentration of inorganic dust registered at km 731 (0.3 mg/m³) that is almost equal to the acceptable one-time maximum allowable concentration (MAC_{ot}). One of the possible causes of the high level of dust could be agricultural machineries freely using the highway and passing it elsewhere or driving along the adjacent to the road ground ways (based on personal observations made during the field surveys).

Table -8 Air quality analysis along the Project Road compared with approved MAC_{ot} in air according to the local standards

| Sampling points along the road (km) | Main pollutants mg/m ³ | | | | | | | |
|-------------------------------------|-----------------------------------|-------------------|-----------------|-------------------|------------------|-------------------|-----------------|-------------------|
| | Inorganic dust | | Sulphur Dioxide | | Nitrogen Dioxide | | Carbon Monoxide | |
| | Test results | MAC _{ot} | Test results | MAC _{ot} | Test results | MAC _{ot} | Test results | MAC _{ot} |
| 705 km | 0.24 | 0.3 | - | 0.5 | 0.033 | 0.085 | 1.26 | 5.0 |
| 707 km | 0.21 | 0.3 | - | 0.5 | 0.027 | 0.085 | 0.48 | 5.0 |
| 709 km | 0.26 | 0.3 | - | 0.5 | 0.038 | 0.085 | 1.74 | 5.0 |
| 711 km | 0.22 | 0.3 | - | 0.5 | 0.022 | 0.085 | 1.17 | 5.0 |
| 713 km | 0.26 | 0.3 | - | 0.5 | 0.037 | 0.085 | 0.69 | 5.0 |
| 715 km | 0.2 | 0.3 | - | 0.5 | 0.033 | 0.085 | 0.68 | 5.0 |
| 717 km | 0.27 | 0.3 | - | 0.5 | 0.041 | 0.085 | 1.34 | 5.0 |
| 719 km | 0.25 | 0.3 | - | 0.5 | 0.024 | 0.085 | 0.48 | 5.0 |
| 721 km | 0.21 | 0.3 | - | 0.5 | 0.028 | 0.085 | 0.6 | 5.0 |
| 723 km | 0.21 | 0.3 | - | 0.5 | 0.022 | 0.085 | 0.58 | 5.0 |
| 725 km | 0.26 | 0.3 | - | 0.5 | 0.031 | 0.085 | 0.81 | 5.0 |
| 727 km | 0.2 | 0.3 | - | 0.5 | 0.032 | 0.085 | 0.7 | 5.0 |
| 729 km | 0.2 | 0.3 | - | 0.5 | 0.032 | 0.085 | 0.9 | 5.0 |
| 731 km | 0.3 | 0.3 | - | 0.5 | 0.014 | 0.085 | 0.38 | 5.0 |
| 733 km | 0.22 | 0.3 | - | 0.5 | 0.028 | 0.085 | 0.43 | 5.0 |
| 735 km | 0.25 | 0.3 | - | 0.5 | 0.026 | 0.085 | 0.5 | 5.0 |
| 737 km | 0.24 | 0.3 | - | 0.5 | 0.029 | 0.085 | 0.56 | 5.0 |
| 739 km | 0.21 | 0.3 | - | 0.5 | 0.03 | 0.085 | 0.43 | 5.0 |
| 741 km | 0.21 | 0.3 | - | 0.5 | 0.034 | 0.085 | 0.68 | 5.0 |
| 742 km | 0.26 | 0.3 | - | 0.5 | 0.034 | 0.085 | 0.7 | 5.0 |

Source: National Kazakhstan EIA (OVOS). Data on MAC was taken from "Sanitary and Epidemiological Requirements for Atmospheric Air in Urban and Rural Areas, Soils and Their Protection, Maintenance of the Territories of Urban and Rural Settlements, Working Conditions with Sources of Physical Impacts Affecting People", dated January 25, 2012

87. The level of concentration of Sulphur Dioxide in air was so low that it wasn't registered by the used field equipment. The other components' concentrations were obtained at sampling points not exceed accepted limits of Kazakhstan standards for air quality.

E.2.8 Climatic Context

88. Project Area. The base data for the climatic characteristics of the Project Area has been obtained from the long-term statistical records of different meteorological stations in South Kazakhstan region (**Table -9**) for the nearest of these station, Shymkent.

Table -9 Climatic characteristics

| Climatic Parameters, units | Shymkent |
|---|----------|
| Average annual temperature, °C | +11.9 °C |
| Absolute recorded maximum temperature, °C | +44 °C |
| Absolute recorded minimum temperature, °C | -34 °C |
| Depth of soil freezing | 14 mm |
| Average amount of precipitation | 455 mm |
| Width of snow cover | 10 cm |
| Mean annual wind speed, m/sec | 2-3 m/s |

Source: Project documentation (local EIA) provided by Road Committee of South-Kazakhstan region

89. The Project Area located within South-Kazakhstan region that can be characterized by sharply continental climate conditions. Summer is very hot, lengthy and dry, with precipitation inadequate for the natural growth of green plants. Warm period lasts for about eight months- from mid-March to mid-November. The hottest month is July with an average temperature of 29,5°C. Daytime can reach 37°C and at nights it drops to 20 °C. Occasionally, during some years, the absolute maximum temperature may reach +49°C.

90. The winter is warm and short – about 3 months, from mid-December to mid-February- with frost rare, but the majority of days is sunny, frequent thaw, and snow-less. Snow-storms happen very rarely. Repetition of strong winds (over 15 m per second) is also limited. The lowest temperature may be noticed in January with an average monthly value of -6 °C. Night air temperature falls up to – 11 °C. The absolute minimum reaches– 40 °C.

91. Stable snow coverage in this area is not recorded, though some years were noticed to be snowy. The average height of the snow does not exceed 1-2 sm. The number of foggy days is also insignificant. It makes only 20 days a year, and not more than 33 days in some of the years. More frequently fog happens in winter, but in average it does not exceed 6 days a month, with a maximum of 14 days a month.

92. Thunderstorms on the subject area are registered year round. More frequently thunderstorms are observed in summer – average of 3 days a month, and in anomalous years - 10 days a month. Thunderstorms are not observed only in December and January.

93. In general, high level of the solar radiation, severe summer temperature of the air, high level of relative humidity, absence of the atmospheric precipitates and frequent dust storms typical for this area create extremely difficult life conditions. The wind regime is illustrated below in the **Table -10**.

Table -10 Wind regimes (Shymkent meteo station)

| Directions and repetition of wind | | | | | | | | |
|-----------------------------------|----|----|----|---|----|----|----|---------|
| January | | | | | | | | |
| N | NE | E | SE | S | SW | W | NW | No wind |
| 5 | 11 | 32 | 14 | 4 | 6 | 11 | 17 | 26 |
| July | | | | | | | | |
| N | NE | E | SE | S | SW | W | NW | No wind |
| 7 | 19 | 25 | 9 | 4 | 6 | 12 | 18 | 19 |

Source: National Kazakhstan EIA (OVOS)

E.3 Social and Economic Environment

E.3.1 Administrative Organization

94. Overview. The Project Area is located in South Kazakhstan region, one of 14 administrative regions of Kazakhstan. There are 11 rural districts and 4 cities of regional importance, 7 cities (except Shymkent), 875 rural settlements in the region. Each region and district and most urban settlements have their own elective councils, charged with drawing up a budget and supervising local taxation. The president appoints the heads of the local administrations (known by the Kazakh term *akim*) and has the power to override or revoke decisions taken by local councils; an akim has the power to control budgetary decisions and to appoint the members of his staff, who are the department heads of the jurisdiction. The akim also can reverse budgetary decisions of the local councils.

Project Area. The Project Road passes through four sub-administrative territorial units of South-Kazakhstan region, in particular:

- Section km 705 – km 713 (8 km) passes through Shymkent city;
- Section km 713 – km 728 (15 km) passes through Sairam district;
- Section km 728 – km 737 (9 km) passes through Tole bi district;
- Section km 737 – km 745 (8 km) passes through Kazygurt district.

E.3.2 Economic Resources

95. Overview. Project Road passes through the territory of the South-Kazakhstan region that social and economic development is based on both agricultural and industrial resources. Manufacturing industries are the most promising ones in the region making about 67.0% of the total industrial production. 38.4% of the manufacturing industry belongs to food processing, 11.1% to metallurgical industry, 8.4% to manufacture of peat coal and 5.3% to refined petroleum products and production of pharmaceutical products.

96. No industries are reported in the immediate Project Area. However there are agricultural lands situated along the Project Road. Agriculture plays important role in social and economic development of the region. During the year (2010) local enterprises produced 7.8 tons - of meat of cattle, pigs, sheep, goats and horses, 91.4 thousand tons - of cotton fiber. Gross value of agricultural production is 163.8 billion while the share of the national volume - 11.4% (**Table -11**).

97. The total sown area of crops in the region increased by 8.7% (697.2 thousand hectares) in 2010 compared with the previous year. However cotton fields decreased by 2.0% in 2010 amounted to 137.3 thousand hectares.

98. Project Area. Economic resources in the immediate vicinity of the Project Area are primarily those that support dry land farming, an irrigation network and the grazing potential of the area's pasturelands. No minerals are known to be exploited in the immediate Project Area. The nearest quarries exploited for construction materials are located at considerable distances to the east and west of the Project Road. No industries or food processing facilities are known to exist in the Project Area.

Table -11 Production, investment and transport

| (Millions of Tenge unless otherwise noted) | | | | | | | |
|--|-------------------------------|-----------------|------------------------------|-----------------------------|---------------------|--|--|
| Industrial Production | Total Agricultural Production | Crop Production | Livestock Farming Production | Volume of Provided Services | Capital Investments | Turnover of Cargo Transport mil. Tonn km | Turnover of passenger Transport. Mil. pas-km |
| 316, 357.7 | 163,832.8 | 85, 152.3 | 77, 734.0 | 38,897.5 | 262, 595 | 4, 510.0 | 7 913,3 |

Source: Department of Statistics of South Kazakhstan region, accessed in January 2011 (<http://www.>

E.3.3 Transport Infrastructure

99. Project Area. The Shymkent – Tashkent Project Road is a link is the major element within the regional transport system. The Project Road represents the main transport link connecting Kazakhstan with the Middle East and South Asia through Uzbekistan. The nearest international airport is located on the territory of Uzbekistan in Tashkent about 80 km from the Project Road. The nearest domestic airport is located in the city of Shymkent about 12 km from the Project Area. The railway Shymkent-Arys-Tashkent passes on the west at a distance of more than 35 km from the starting point of the rehabilitated road. There is no waterway situated close to or within the Project Road.

100. In addition to the Project Road, the most significant transport features in the immediate Project Area are rehabilitated grade separated interchange at km 732+963 and several crossroads with adjacent local roads linking local villages with regional transport network.

E.3.4 Water Supply & Irrigation Systems

101. Overview. Nowadays only 482 settlements of total 900 of the South Kazakhstan region supplied with the drinking water that makes only 53.7% of the whole population of the region. Residents of 247 localities use well water: 66 of which is usually taken from the open sources and 21 from the spring wells. Village dwellers of the past 13 settlements continue to use imported water. Project Area. The Project documentation indicates that water for construction possibly will be taken from the Badam River which passes through the city of Shymkent. The drinking water for construction camps is also proposed to be drawn from the existing water supply system of the city of Shymkent.

102. The best way to avoid any shortage of the local water resources it to establish autonomous water sources for the construction camps. According to information obtained from the regional Akimat, there are large amounts of underground water resources available for the local water supply, but not all of them have been put into production. In addition, the local authorities include in these balances slightly saline waters that could still be used for various domestic and industrial purposes.

103. Due to the area's limited rainfall, agricultural production in southern Kazakhstan relies heavily on the use of irrigation systems with water supplies derived from snow melts in the mountains. There is well developed irrigation network situated within Project Area. The Project will include the construction of installation or rehabilitation of 36 culverts.

E.3.5 Wastewater & Solid Waste Disposal

104. Overview. The total length of wastewater and drainage networks of the region is 754.6 km. The only cities are supplied with centralized wastewater systems: including in Shymkent (512.4 km of wastewater channels), Arys (29.1 km of wastewater channels), Zhetysay (8.6 km of wastewater channels), Kentau (28.4 km of wastewater channels), Saryagash (13.5 km of wastewater channels), Lenger (66.5 km of wastewater channels), Shardara (49.7 km of wastewater channels) and the city of Turkestan (46.4 km of wastewater channels). All the networks belong to the communal ownerships of cities and most of them in a bad technical condition and need to be replaced. The city of Shymkent is the closest settlement with its own sewage system located on North of the Project Road.

105. Project Area. Each town is reported to have an organization under the district Akimat which is responsible for collection and disposal of solid waste. None of these organizations extend solid waste collection services to the vicinity of the Project Road. However there some illegal waste can be observed along the road, especially close to the abandoned and damaged empty structures. In general the lack of the waste management along the existing highway is visible and supported by the local people concerns.

E.3.6 Electrical Power, Pipelines & Other Utilities

106. Overview. Electricity is one of the major economic sectors of the Project located region. Energy enterprises produce about 45-47% of electricity needs of the region. However South-Kazakhstan itself is experiencing a significant shortage of electricity. The internal energy sources provide 45% -47% of the total local electricity needs, the rest are supplied mainly from the northern regions of the country through the power transmission lines with the power of 220 - 500 kV. Partly energy imported from the Kyrgyz Republic on the basis of an intergovernmental agreement on the integrated use of the Naryn-Syrdarya hydro power station. Electricity distribution Company Ontustik Zharyk transit LLC maintains an electrical network of 110 kV and below with the total length of high voltage overhead and cable lines is 22,310 km. About 21,730.987 km, of which are air power grids and 578.895 km is cable lines.

107. Project Area. It is planned to rehabilitate in total 9 electricity lines of 10kV and 0, 4kV crossing the Project Road. There are five intersections with electricity overhead lines of 10kV. The planned rehabilitation includes replacement of old poles with new concrete ones.

E.3.7 Land Uses and Displacement Issues

108. Project Area. Land uses along the Project Road are dominated by agriculture; mostly grazing (cattle, sheep, goats and herding of horses) and dry cash crops such as wheat and corn. Farm crops are mainly fodder plants, wheat and maize. Almost all homesteads in the rural areas have small horticulture gardens for growing common vegetables for self consumption. Some level of irrigated farming exists in the area as evidenced by the fact that the Project includes plans to rehabilitate 36 irrigation pipes.

109. There are also some structures situated along the road within fixed ROW. Nevertheless as reported by the head of the RC of South-Kazakhstan region none of the existing structures situated along the road will be impacted or damaged during the construction of the Project Road.

E.3.8 Demographic Characteristics

110. Overview. The Project Area is within South Kazakhstan region which had a population of 2.6 million people reported in January 2011 and a population density of about 22 people to km². The urban population is 1,007.8 thousand people (39.3%) and rural population is 1,559.9 thousand people (60.7%). Gender statistics of the region can be described as follow, according to the data dated to January 2011, the number of men in the area is 1,269.405 thousand (49.4%) and women 1,298.302 thousand (50.6%).

111. Project Area. Data on demographic situation of the districts crossed by the Project Road sections is provided by **Table -12**.

Table -12 Characteristic of population of the Project Area

| Administrative Unit | Population As of January 2011 | Born (January 2011), | Died (January 2011) | In-Migrants (January 2011) | Out-Migrants (January 2011) | Employed (January 2011) |
|---------------------|-------------------------------|----------------------|---------------------|----------------------------|-----------------------------|-------------------------|
| Shymkent | 629,100 | 16,600 | 4,063 | 11,751 | 10,735 | 126,300 |
| Tole bi district | 127,400 | 3,450 | 941 | 1,794 | 1,736 | 10,900 |
| Sairam district | 302,700 | 9,568 | 1,616 | 749 | 1010 | 44,139 |
| Kazygurt district | 105,500 | 3,275 | 618 | 500 | 1,353 | 51,876 |

Source: Retrieved from the Department on Statistics of South Kazakhstan region, Shymkent, 2012

E.3.9 Employment

112. Overview. Industry is one of the important economic sectors in the region. The number of economically active people of South Kazakhstan region is 1.091 thousand people. About 449 of economically active people are living in the cities. The number of employed people in 2011 has increased to 337.5 thousand people. The number of unemployed people amounts to 68.4 thousand people. The current level of unemployed in the region is 5.9%. The number of economically inactive people (e.g., school pupils, students, householders, retirees and disable

people) is 465.7 thousand people with rate of economically passive people equal to 28.6 %. Statistical data on relevant to Project Area districts is given in **Table -13**.

Table -13 Employment in the Project Area

| Administrative Unit | Employed (December of 2011) number of people | Hired Workers (Percent) | Unemployment Rate (Percent) |
|---------------------|--|----------------------------|--------------------------------|
| Shymkent | 126,300 | 52.4 | 5.4 |
| Tole bi district | 10,900 | 52.4 | 5.7 |
| Kazigurt district | 9,400 | 52.4 | 5.8 |
| Sairam district | 32,100 | 52.4 | 5.1 |

Source: Department on Statistics of South Kazakhstan region

E.3.10 Employment Ethnic & Vulnerable Groups

113. Overview. Native Kazakhs, a mix of Turkic and Mongol nomadic tribes, migrated into the area now known as Kazakhstan region in the 13th century and remain the country's largest ethnic group. The Kazakh steppes joined to Russia in the 18th century. Kazakhstan became a Soviet Republic in 1936. During the 1950s and 1960s agricultural "Virgin Lands" program, Soviet citizens were encouraged to help cultivate Kazakhstan's northern pastures. This influx of immigrants (mostly Russians, but also some other deported nationalities) altered the ethnic mixture and enabled non-Kazakhs to outnumber natives. Independence in 1991 caused many of these newcomers to emigrate. The 2009 Census reported South Kazakhstan region's ethnic groups as follows:

| | | |
|----------------------|------------------|--------------------|
| Kazakh (70.2%) | Tadjiks (1.17) | Kurds (0.34%) |
| Uzbek (17.50%) | Tatars (0.88%) | Ukrainians (0.33%) |
| Russians (5.96%) | Turks (0.87%) | German (0.15%) |
| Azerbaijanis (1.26%) | Koreans (0.40 %) | Other (0.9%) |

114. The population of the region differs from the national averages with a larger percentage of Kazakhs and a significantly smaller number of Russians. Project Area. Within the immediate vicinity of the Project, the resident population is extremely small and predominantly Kazakh. Most of the residents of the rural areas follow the Muslim religion.

115. Overview. The standard of living of the population in 2010 is characterized by the key indicators of nominal real incomes per person, which in the South-Kazakhstan was amounted to KZT 25,037 per month, while monthly average expenditures was KZT 15,420 per capita. Percentage of population below the poverty level in the area is 11.5% of the total population. The level of standard of living of the South-Kazakhstan population in 2010 is given in **Table -14**.

116. There has been an increase of income per capita in the whole region when the higher income was recorded in Shymkent, Arys and Suzak cities in the recent years. Lowest income per capita was indicated in Kazygurt and Saryagash districts. There are more than 39.6 thousand Second World War veterans and persons equated to them, including 1,492 disabled people and participants of the Second World War, as well as more than 113 thousand mothers of large families, which is 5.47% more than in 2008 and 603 elder people living alone (older than 80 years) in the South-Kazakhstan region.

E.3.11 Health Facilities and Public Health Issues

117. Overview. Following its appointment as a member of the World Trade Organization (WTO), Kazakhstan has brought its local medical regulations in line with international standards. A program of reforming and development of public health has been approved by the Government. Its main measures include plans to increase public health expenditure to four percent of GDP by 2010. In keeping with this national policy, the region and district level healthcare institutions are being restructured from being purely public to being semi-private institutions.

118. There are well developed medical infrastructure in the South-Kazakhstan region consists with 120 hospital organizations, including 43 rural hospitals; 250 polyclinics, including 29 clinics, 24 primary health care centres; 168 treatment polyclinics and 539 health centres. Project Area. The closest large medical facilities to the proposed ROW located in the largest regional city of Shymkent. However there are also district level polyclinic in Rabat with 2 emergency cars and some medical posts usually served by 1 or 2 people in all villages.

Table -14 Indicators of living standards in South-Kazakhstan region

| Name of the indicator | Units | |
|--|-----------------|--------|
| Nominal and real income, the monthly average per capita | KZT | 25,037 |
| Percentage of population with incomes below the subsistence minimum | % | 11.5 |
| The growth rate of the population with incomes below the subsistence minimum | Thousand people | 451.1 |
| | % | 98.3 |
| The index of real income | % | 109.2 |
| Monthly expenditure per capita | KZT | 15,420 |
| Consumer spending | KZT | 14,705 |

Source: Department on Statistics of South Kazakhstan region

E.3.12 Local Education Facilities and Amenities

119. Overview. Primary and secondary education in Kazakhstan consists in three main educational phases: Primary education (forms 1-4); Basic general education (forms 5-9) and Senior level education (forms 10-11 or 12) divided into continued general education and professional education.

120. In South Kazakhstan region, as in other regions of Kazakhstan, public secondary education is mandatory for all children under 18 years of age. There were 530.6 thousand students registered in 2011 - 2012 school year in the South Kazakhstan region. According to National Statistical Agency, for January 2011, 99.0% of schools in South-Kazakhstan region are computerized, 93 percent of schools connected to telephone land lines, and 85 percent of schools have access to internet. In the field of 92 institutions of technical and vocational training is carried out on 90 specialties in the number of 77,227 people. There are 93 after school education institutions. The overall employment rate is about 97%. Most of higher education institutions are located in Shymkent.

121. Project Area. No local education facilities or amenities are known to be located in the Project Area. The closest are believed to be located in the city of Shymkent and some other villages located close to the road (like Akzhar, Aktas, Rabat and village after K.Mambetov (Mambetov)).

E.3.13 Human Trafficking

122. Overview. There is considerable flow of labour migrants from Uzbekistan to South-Kazakhstan region or through it to other parts of Kazakhstan, mostly illegally working in the construction sector. There are several NGO assisting migrants and working against human trafficking, like the Legal Centre for Women's Initiatives "Sana Sezim" and Public Association "Bereke" in South-Kazakhstan based in the city of Shymkent.

123. NGO Sana Sezim has well-developed organisation structure (**Figure-7**) and cooperation links with other relevant organisation working on protection of human rights. Among one of the recent projects implemented by NGO in December 2011 – December 2012 – "Providing legal assistance to migrant workers from Uzbekistan" supported by Embassy of Norway in Kazakhstan.

E.3.14 Cultural Resources

124. Overview. South Kazakhstan region is one of the valuable historical places of the Republic of Kazakhstan. It has many historical and architectural monuments. There are 33 monuments of the material and spiritual culture of national importance and 434 sites of local importance registered in the South-Kazakhstan region. Project Area. However there are no resources of cultural or historical importance situated within the Project Area except newly established monument called Noah's Ark. This modern monument is located up on one of the Kazygurt hills and it has panoramic area around it. There are arranged road access from the highway to a built-up parking area and pedestrian walkways supported by stairs. Nowadays monument is one of the popular places to visit among young people living in Shymkent and some other villages located along the Project Road.

E.3.15 Public Safety

125. Overview. According to the State Committee on Legal Statistics and Special Records of South-Kazakhstan region in 2010, the number of reported crimes amounted to 10.331 cases in the region. Among the most common types of crimes are crimes against property. The share of female persons committing crimes in 2010 was 12.2% (in 2000 - 13.0%), including females under the 18 year - 7.8% (in 2000 9.0%). The unemployed population accounted for 84.0% (85.0%) of all identified offenders of the crime.

126. As reported by NGO Sana Sezim, domestic violence against women seems a general problem. Most of the case linked with women impacted by human trafficking.

Figure -7 Working structure of NGO Sana Sezim



Source: Official web-site of NGO Sana Sezim <http://sanasezim.org>

F. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

127. The planned rehabilitation of the Shymkent-Tashkent road had been classified as a Category B project under the provisions of ADB Safeguards Policy Statement (July 2009), which means that no significant and irreversible impacts are expected as a result of the proposed interventions. This initial classification coincides with the results of the regional assessment, which confirms that the relevant environmental issues will mainly relate to the construction period.

128. While the project will also involve upgrading of the first 37 km of the existing road, this will be undertaken within the existing ROW and will not impact on any critical areas. Further, this road section is located close to Shymkent where the environment already impacted by anthropogenic activity. As such, the expected project impacts will be largely experienced during the construction phase and are considered temporary. However some potential impacts need to be taken into consideration during the Pre-Construction Phase.

F.1 Pre-Construction Phase

F.1.1 Design Project

129. Since, this is an existing road and proposed for rehabilitation the same alignment will be followed with required geometrical improvements and widening of the road. The road design follows the highway road construction standards of Kazakhstan. The visual appearance of the landscape along the Project Area will change to some extent because of construction of structures such as (elevated) embankments, culverts, crossway passages, roadside plantations etc.

130. Visual changes to the topography will be of permanent and minor negative in nature and do not require mitigation measures, except that the Project design should consider aesthetic concerns. The latter refers particularly to roadside plantations and re-installation of borrow sites.

F.1.2 Pedestrian Crossings

131. Due to the planned change of the road speed and presence of public using facilities like bus stops along the road it is important to consider pedestrian safety early on the pre-construction phase. Absence of adequate installation of bypassing facilities together with warning signage might cause increase of road accidents and impact on development of negative perception of the International highway by local population.

132. Generally, the Design makes provisions for bypassing the highway traffic to ensure that local residents do not come in direct contact with traffic movements. Bus stops near settlements are planned on the side of carriageway where most people would access. The warning signage and speed limits are included at all sections where pedestrian crossing facilities are planned. Pedestrian crossings need to incorporate structures that allow the use of prams, wheelchairs, bicycles and pushcarts.

F.1.3 Local Animal Passages

133. Domestic animals are observed at certain sections of the road corridor, particularly in the vicinity of human settlements, and this fact may impact the road safety. Road accidents can be caused by livestock unexpectedly passing the highway.

134. There are four existing animal crossings functionally combined with agricultural machinery passages situated along the Project Areas that have to be rehabilitated with preservation of its' geometry or widening of the narrow ones. The Design also includes establishment of adequate fencing near the animal crossings on both sides of the road.

F.1.4 Removal of Roadside Vegetation

135. Roadside shelterbelt areas are a rare and valuable natural asset in the generally uniform steppe landscape dominating the road corridor. Because of their intrinsic ecological

benefits and values, roadside plants (especially large bushes and trees) should be maintained to the maximum extent possible, as they act as natural barriers absorbing sand and dust impacts. Roadside plantations will also contribute to a year-round aesthetical improvement of the landscape. Both authorized and un-authorized cutting of roadside trees will affect the overall ecological properties in the Project Areas.

136. However, the impact will be medium-termed and moderate, as long as the plantation of new trees is integrated in the Design documentation as reported by local OVOS. In addition to this it worth to consider the fact that none of new trees should be palatable for local grazers. Import of exogenous/alien plant species for plantation shall be strictly forbidden. During the detailed design a cutting plan will be prepared and included in the contract specifications. It needs to be approved by the responsible agency, the Regional Units of the Ministry of Agriculture's Forestry and Hunting Committee (CFH) in Shymkent. The Contractors will be required to limit cutting and pay strict attention to the detailed design measure and consult with CFH.

F.1.5 Site Selection of Work Camps and Facilities

137. The location of the Constructor's camp site is often crucial in planning for environmental safeguards, particularly in view of protecting the public general as well as the work force from adverse impacts, nuisances and health hazards. Unappropriate siting of work camp and material stores, together with bringing of outside labor, may cause encroachment of agriculture land, alteration of drainage, solid waste and waste water problems. In addition, the location of construction camps within or in vicinity to an existing settlement (like in Shymkent, Aktas, Akzhar, Mambetov etc.) can result in a number of other impacts and conflicts, such as shortage and competition for amenities, food and water.

138. The National Kazakhstan EIA (OVOS) as well as Design documentation make several assumptions and pre-selections of potential sites, but the final decision on selecting a location will depend on the Contractor and his logistic requirements. The final site selection of the camp site and particularly the positioning of impact-generating machineries like the Asphalt Mixing Plant, crushers and concrete batchers should follow a careful consultation of the local wind conditions, in order to choose locations that are always in sufficient distance on the leeward side of the prevailing local winds. Locating of work camp sites or emission-generating machineries and yards in a distance shorter than 500 m from sensitive spots like schools, hospitals and recreational facilities should be prohibitive.

139. All planned and ongoing activities associated with construction camps, including storage facilities, workers dormitories, sanitary instalments and safety measures are subject to the recommendations presented in the EMP. This is particularly the case where construction camps will be set up within or nearby existing settlements. In line with the Kazakhstan legislative framework the principal tool to ensure an environmentally sound execution of all construction works, including the establishment for work camps and facilities, is the preparation of a site management plan – in Kazakh terminology recognized as 'Construction Environment Action Plan (CEAP)'. This CEAP, subject to approval by various agencies, is the essential warrant that all work activities will be carried out in an environmentally sound manner, aiming at eliminating or minimizing potential impacts identified in the Kazakh EIA or in this document. Compliance will be strictly monitored by supervision engineers, and the Contractor will be held liable for any non-compliance.

F.1.6 Local Water Resources

140. Construction works require large amounts of water, both for supply of drinking water for the labour forces and the operation of the camp sites, and for all technical purposes relating to construction activities. The required amounts may attain tangible volumes that may interfere with local water resources, and thereby bear the potential for interference with communal livelihood and needs.

141. All Contractors have to submit a plan for type, location and quantity of both drinking and technical water extraction. Non-approved extraction of large amounts of water from the local aquifer may also result in a number of secondary impacts, most of them prone to cause

ecological issues and social conflicts, as well as delays for the project. Therefore, the extraction plans need meticulously be observed and monitored, and require prior approval from local authorities.

F.1.7 Selection of Borrow Pits

142. All required construction materials are reported in available in sufficient source quantities and qualities according to the Design documentation. Reinforced concrete products and pre-cast structures (such as pipe culverts) and few more special road construction materials need to be transported from the city of Shymkent. However there is a still risk of adverse impacts like accelerated land erosion, landslides, disturbance in natural drainage patterns, water logging and water pollution mostly could be linked with the need of establishment of new borrow pits.

143. The selection and operation of borrow pits needs to be carried out with all due considerations to avoid any impact on the existing natural and human environment, and to make provisions that no secondary impacts such as soil and aquifer pollution will occur. In case where new hauling roads need to be constructed, the Contractors need to detail all particulars and precautionary measures in the CEAP. In cases where hauling roads pass through intensively used pasture land, protective animal fences need to be established along such roads to prevent collisions with local livestock. Special attention need to be given to the stockpiling of borrow materials to avoid spillage of sediments into nearby terrain. All borrow pits and temporary hauling roads need to be re-instated into their former (close-to-natural) condition and appearance.

F.1.8 Cultural, Historical and Archaeological Assets

144. Although not identified in the preliminary survey of the Design Company, there is always a risk that earth works may encounter or damage existing structures of cultural, historical or archaeological value.

145. In case of accidental discovery of locally valuable cultural or historical structures the Contractor needs immediately inform the Engineer respectively representatives of the Archaeological Expertise Institute of Kazakhstan who then will advise on further and appropriate actions. Construction works are to be resumed only after written approval from this agency. The Contractor shall seek, in close consultation with the RE and the relatives of the victim, an amicable solution in cases where a burial or memory sites (tombstone, with or without small fence) is located within the RoW. Such tombs may be relocated for few hundred meters, as applicable and agreed by the family or representatives of the road victim.

F.1.9 Indigenous or Vulnerable People

146. The Contractors shall be obliged to pay special to common gender issues, and to overcome disproportional discriminations of women by the provision of sufficient and fairly-paid work contracts. There is also potential risk of human trafficking, often associated with construction projects, is equally addressed in the EMP.

F.2 Construction Phase

F.2.1 Potential Impacts on Public Access, Utilities and Services

147. As the rehabilitation of the Project Road considers replacement of existing engineering infrastructure, that might cause impacts to local services associated with construction works within or nearby local settlements. The Contractor has to be responsible for arrangement of continuous work of all local services and utilities that may potentially be affected by the construction works. This is particularly important in view of public utilities (water pipes, electric cables) which are planned to be removed due to widening the carriageway. All utilities subject to removal need to be fully replaced before disconnecting the existing utility.

148. The best practice for precaution of any forthcoming problems with local residents include (i) timely public announcement of near-future planned construction activities (ii) strict observance of working hours and speed limits as determined in the Technical Specifications,

and (iii) involving as much as possible local residents in work contracts to secure their satisfaction and support.

149. Any damage or hindrance/disadvantage to local business caused by the premature removal or insufficient replacement of public utilities is subject to full compensation, all at the full liability of the Contractor who caused the problem. The Contractor shall also maintain unhindered access and use of social, cultural and religious sites (e.g. mosques, cemeteries, cultural gathering places, sports facilities). In case of any damage of private properties, including livestock and homestead gardens, the Contractor will be held fully liable to compensate and rectify the inflicted damage.

150. The presence of construction camps may put additional problems for local utilities. Work Sites require large and steady amounts of electricity, which may overburden the local supply services. Local health services will be under possible pressure of large numbers of work force in the area that might require additional assistance. Finally, the close location of work camps near settlements can possibly impair the entire social and cultural fabrics of the resident community (e.g. increase of air and noise pollution, social conflicts, crime rates, STDs, prostitution etc.).

151. The Contractors/sub-contractors shall exert all efforts to maintain good relationship with the local residents, particularly while aiming at preventing noise and air pollution impacts, and avoidance of crime conflicts with the work forces.

F.2.2 Campsites

152. Construction camps can evoke short to medium-term impacts, although most of these impacts are manageable and shall not interfere with the public life of nearby communities. Unappropriate siting of work camp and material stores, together with bringing of outside labor, may cause encroachment of agriculture land, alteration of drainage, solid waste/ waste water problems, and spread of infections. In addition, the location of construction camps within or in vicinity to an existing settlement (like in Shymkent, Aktas, Akzhar, Mambetov etc.) can result in a number of other impacts and conflicts, such as shortage and competition for amenities, food and water.

153. Although temporary and mostly moderate, construction-related noise impacts in the vicinity of residential areas are likely to cause some health problems. The maximum allowable noise level of point sources shall not exceed 70 dBA. Of particular concern are noise levels in the vicinity of schools, kindergartens and hospitals, where noise levels should not exceed 10 dBA. The Contractor has to make all possible efforts to keep the noise production at the lowest possible level when carrying out his works in the vicinity of such sensitive spots.

154. For establishment of work campsites, most if not all of the potential impacts can be set off by choosing a location in sufficient far distance from existing settlements, as long as electricity and water supply can be managed. One of the guiding principles for site selection is the alignment to the prevailing wind directions and consultation with local authorities.

155. In case of the location of the camp site near settling area mitigation measures against noise and vibration have to include, but are not limited to the following:

- (i) Selection of modern and well-serviced equipment and plants with reduced noise level ensured by suitable in-built techniques and appropriate silencing devices;
- (ii) Confining excessively noisy work and movement of heavy machinery to specified daytime working hours (this relates especially to stone crushers, percussion hammers and pneumatic drills);
- (iii) Work hours need observe special restrictions near residential and sensitive areas;
- (iv) Providing the construction workers with suitable hearing protection (ear muffs);
- (v) Avoid vehicle idling.

156. Public information is required wherever works including bulldozers, scrapers, pneumatic hammers, crushers, loaders, and compaction loaders produce excessive noise and

vibration, to alert the public general for unavoidable noise development and the anticipated level of nuisance. As rule of good practice, no construction activity should be carried out near human settlements that would exceed 90 dBA for more than one continual hour. In case of proven damages to infrastructure (private and non-private assets) the Contractor is obliged to seek friendly settlement of disputes and make ample provision for adequate compensation payment to the afflicted owners.

157. Unbalanced driving habits are the main sources of vibration impacts on structural objects, including humans. As for construction machinery, good driving practices are within the obligations of the Contractor for guiding his work forces. Otherwise, road surface compaction, surface granule metric composition and speed control are proven means of containing such impacts.

158. The working ambience must fulfil minimum and standard requirements for ensuring healthy and safe work conditions, as prior defined in the CEAP. Mandatory mitigation actions include:

- (i) All contracted labour shall undergo a medical examination which should form the basis of an (obligatory) health/accident insurance and welfare provisions to be included in the work contracts. The Contractor shall maintain records of health and welfare conditions for each person contractually engaged.
- (ii) The contractor shall seek his own electric supply system, preferably separated from the public grid.
- (iii) After consulting with local Water Departments, the contractor needs to ensure his own water supply system (supposedly by constructing his own wells for drinking water purposes.
- (iv) As for use water, he needs to initiate tests by the specialized agency to determine the maximum allowable abstraction volume from local groundwater or any other water sources.
- (v) The Contractor shall provide adequate and functional systems for sanitary conditions, toilet facilities, waste management, labour dormitories and cooking facilities. To the extent possible, he shall provide (import) food items for the workers to alleviate potential burdens from scarce local market resources.
- (vi) The camp sites, and particularly the fuelling area, shall be equipped with the special wastewater collectors combined with separator basins. The camp site needs to have its own sealed containers for sludge disposal from septic tanks.
- (vii) The problem of overburdening the local health facilities can be best solved by establishing a well-equipped ambulance station at the camp sites, and to engage qualified medical personnel for the entire duration of the work phase. Such personnel should also be trained in conducting regular awareness campaigns among the workers, focusing on the prevention and control of communicable diseases (e.g. HIV/AIDS) and drug abuses.
- (viii) The camp site should be secured against unauthorized access. Special precaution measures are required for securing and storing hazardous materials.

159. In order to ensure the safety of employees during the performance of their duties, it is suggested:

- (i) to provide all workers with work-specific protective clothing;
- (ii) to provide sufficient hygiene supplies and sanitary facilities;
- (iii) to prevent occupational diseases;
- (iv) to prevent communication of sexually transmittable diseases;
- (v) organization of good rest and nutrition workers during working breaks;
- (vi) implementation of social benefits and guarantees.

160. Each contractor will be requested to prepare an approved Site-Specific Environmental Action Plan (SS EMP), which will, among others, delineate all work safety

aspects he intends to apply. Focal points of the SS EMP will relate to means, type and number of protective clothing, safety precautions at specific work sites, first aid, rescue plans, and all intended measures for avoiding or proper clearance of hazardous substances, including fuelling operations, transport and handling of hazardous materials and explosives, securing measures etc.

161. Construction works and activities carried out in workshops bear the numerous accident and health risks for both the labourers and the public general, with varying direct and indirect consequences. Therefore, the SS EMP needs to make provision for specific medical services and provisions, workers insurance policies and indemnities, emergency provisions and a rescue/evacuation planning in case of major accidents.

162. The contractor will be obliged to hold, at regular intervals, training sessions with all work forces (including engineers and supervisors) that will address the following aspects:

- (i) General aspects on work safety and environmental awareness building;
- (ii) Worker's responsibilities in case of emergency and spills;
- (iii) General work safety in relation to common work risks, demonstration and use of protective equipment (first aid, fire extinguishers, handling explosives,)
- (iv) Work hours and speed limits, environmentally harmful activities;
- (v) First aid assistance and medical assistance in emergency cases;
- (vi) Emergency/rescue action training, incl. use of towing equipment;
- (vii) Raising awareness on the problem of conveying sexually transmissible diseases (e.g. Syphilis and HIV/AIDS) between work forces and local residents;
- (viii) Avoidance of conflicts with local communities, maintaining good relationship with local residents and authorities;
- (ix) Actions required in case of detecting archaeological or historical items during work.

F.2.3 Air Pollution

163. Air pollution is known to cause a variety of health risks to both the workers and the general public. Dust will be major problem during the construction of the road. It is anticipated that impact on air quality will be direct, of low magnitude, local, reversible and short term.

164. The Contractor should include necessary measures to reduce air pollution and dust development that would impact the public health, by:

- (i) provision of dust masks to operating personnel;
- (ii) arrangement of regular water spraying;
- (iii) equipping of asphalt, hot mix and batching plants with fabric filters or wet scrubbers to reduce the level of dust emissions;
- (iv) provision of protecting canvasses obligatory for all trucks transporting material that could generate dust, and
- (v) planning of access roads sufficient distances from residential areas and, in particular, from local schools and hospitals.

165. Appropriate measures should be taken to limit or suppress exhaust emissions from construction vehicles. Construction vehicles and machinery should be kept in good working order, regularly serviced and engines turned off when not in use. The Contractor should provide specific and regular training to all work personnel to ensure avoidance or minimization of the anticipated impacts associated with work operations.

166. Vehicles with an open load-carrying case transporting potentially dust-producing material shall have properly fitting sides and tail boards. Dust-prone materials should not be loaded to a level higher than the side and tail boards, and should be covered with a strong tarpaulin. In periods of high wind, dust-generating operations should not be permitted within 200

m of residential areas. Special precautions need to be applied in the vicinity of sensitive areas such as schools, kindergartens and hospitals.

167. Unauthorized burning of construction waste material shall be subject to penalties for the contractor, and withholding of payment.

F.2.4 Surface and Groundwater Resources

168. During construction surface and groundwater resources may be polluted by spoil and construction wastes. Rest areas and petrol filling stations are the principal locations where road users may contribute to pollution of water resources. Installation of suitable garbage containers, functional public toilets and appropriate signage at rest areas are suggested. Some surface water resources, like local lakes, can be impacted by illegal fishing activities that may cause wide range of negative outcomes from pollution to dissatisfaction with the local population.

169. For the extraction of water for construction purposes, the intake from natural surface waters like the Badam or Keles Rivers will require prior permission of the responsible local authorities. The Contractors must equally give full attention to prevent any pollution of the river, input of excessive sediment loads or change of the natural flow, since the local population uses this river for domestic purposes. The contractor must control any illegal fishing activities by work forces, and shall strictly impose penalties on violators.

F.2.5 Borrow Pit Operations and Excavations

170. Most of the construction materials are planned to be taken from existing functioning borrow pit pre-defined in the Design documentation. However there is a still risk of adverse impacts like accelerated land erosion, landslides, disturbance in natural drainage patterns, water logging and water pollution mostly could be linked with the need of establishment of new borrow pits.

171. If there will be need on establishment of a new one, Technical Specifications have to be filled with guidance to Contractors and Sub-Contractors on the opening, operation and closing of quarries and borrow pits. A site management plan will be required for each borrow pit operation. While the contractor will be sourcing the borrow materials under their own arrangement, the following measures to minimize impacts associated with the operation of borrow areas shall be implemented:

- (i) Secure all required environmental approvals and carry out extraction and rehabilitation activities consistent with the requirements of MOEP and/or permit conditions;
- (ii) Prior to operation of the borrow areas submit to RC and construction supervision engineer the following:
 - a plan indicating the location of the proposed extraction site as well as rehabilitation measures to be implemented for the borrow areas and access roads upon project completion
 - dust management plan which shall include schedule for spraying on access road and details of the equipment to be used
- (iii) Undertake regular dust suppression on all unpaved access roads during the construction period, particularly in sections where critical receptors, such as settlements, are located;
- (iv) Locate stockpiles away from watercourses to avoid obstruction of flow and siltation;
- (v) Provide cover on haul trucks to minimize dust emission and material spillage;
- (vi) Undertake repair of access roads to their original condition.

F.2.6 Specific Construction Activities

172. The operation of asphalt mixing plants (AMP) frequently causes a number of environmental impacts. Although short in time, the corresponding impacts may result in substantial health risks for the public general and for the workers. The best mitigation measure

is to pre-select the site for installing the AMP at a location in sufficient distance (2-5 km) from any residential settlement.

173. **Bitumen Works:** Such works, including coat layering with asphalt concrete, may cause a number of risks and impacts that need to be addressed in the mitigation framework. The prime risks are associated with work safety and ambient pollution. Bitumen works can also cause health and safety concerns for both the public and the labourers. Precautionary measures, being the full responsibility of the Contractor, include: Hot bitumen shall not get in contact with water and dust, bitumen and solvents shall not be spilled on ground, ditches or water courses. If this happens, spills need to be removed immediately and disposed in a safe site that is protected from public access. No waste material shall be burned in connection with hot bitumen. All manual works while handling bitumen require special protective clothing (shoes and gloves). Bitumen works shall not be carried out in winter, rainy or stormy weather conditions. Trucks used for hauling asphalt mixture shall be adequately equipped. Surfacing works should not occupy more than one single traffic lane at a time.

174. **Concrete Works:** Concrete is prone to become damaged when cast at unsuitable ambient temperatures. This refers particularly to the maintenance of minimum safety standards for road construction where concrete will be the predominant material. Casting concrete structures such as culverts, cattle crossings and grade separated interchange at site as well as construction of the road concrete cement surface along the road may cause spread and contamination by cement dust, which in turn will negatively affect soil and surface water qualities. It will also result in detrimental effects on the surrounding vegetation.

175. **Mitigation actions include:** Restrict concrete works at site to suitable weather conditions, avoiding particularly windy, icy or very hot conditions. If feasible, pre-cast solutions should be given preference. Dust development at site can be managed by suitable covers (canvas) and/or water spraying. When casting concrete structures under water, provisions shall be made to utilize cofferdams. Spray waters used for slowly curing the new-cast concrete structures shall not contaminate adjacent surface or groundwater resources. Proven protective methods shall be explored as feasible, including (i) collection of excessive spray waters and safe disposal, (ii) covering the newly cast concrete surface with waterproof sheet material or sand to prevent moisture losses, and (iii) accelerating the curing process by using steam or radiant heating. While working with additives (e.g. anti-corrosive mixtures) special care needs to be applied, following the general and specific precaution prescriptions described in the Contractor's work safety guidelines.

176. **Stockpiling:** Stockpiles of materials, if wrongly sited and/or protected, may cause environmental problems in terms of dust development, leaching of harmful substances into soil and water resources, erosion and siltation. Therefore, stockpiles shall be short-termed, and place in sheltered and guarded areas near actual construction sites or within the camp sites. Placing shall be at minimum distances specified by the site engineer, away from sensitive areas and residential areas. Stockpiles of friable material shall be covered with clean tarpaulins, with application of sprayed water during dry and windy weather. Stockpiles of material or debris shall be dampened prior to their movement, unless otherwise specified by the site engineer. Stockpiles shall not contain any harmful soluble substances, and be protected from public access.

177. For each borrow pit operation site the contractor shall equally submit a Site Management Plan including all planned operations, quantities, hauling arrangements and security precautions. The plan shall provide full details on environmental protection measures, especially in view of protecting any local water resource and proper decommissioning the sites.

F.2.7 Potential Impacts related to Waste Management and Waste Disposal

178. Construction works include transport, handling and storage of a number of hazardous materials, some of them bearing critical health risks for humans, drinking water and food items when being contaminated.

179. In this project, commendable countermeasures include: (i) development of a waste management plan, (ii) development of a management plan for transport, handling and storing

hazardous material (iii) preparation of a contingency plan in the event of an accident involving hazardous material. Such emergency plan needs to be consulted and coordinated with the local health facilities. All mentioned risk management plans need to be approved by the RE and the Environmental Supervision Consultant.

180. Explosives need be treated with specific care and arrangements for restricted uses and safety measures. The responsibility for devising management plans for the use of explosives lies in the hands of the Contractor and will be subject to meticulous monitoring.

181. For protection of settlements and residents, the Contractor must explore all possible means to avoid accidental spills, be it by poor transport arrangements, by inadequate handling or storage of hazardous materials. Such materials need to be stored in special sites and containers / tanks to reduce the risk of accidental spilling. Of special importance is the observation of strict safety arrangements, i.e. storage in well-locked and fireproof areas, access restrictions to authorized personnel, all-time watch personnel and meticulous bookkeeping records about incoming and outgoing types and quantities of such materials.

182. Unauthorized burning of construction waste material shall be subject to penalties for the contractor, and withholding of payment.

F.2.8 Biodiversity and Ecological Resources

183. The proposed area does not include significant habitats of wildlife and bird species. However, there is a small forest of local importance situated close to the start point of the road near the city of Shymkent and Kazygurt mountain where common species of wildlife exist. Construction works may disturb these animals and birds. Disturbance to local wildlife, such as illegal hunting activities by work forces are common problems associated with road construction projects.

184. The EMP therefore provides a number of mitigation measures to address such likely impacts.

F.2.9 Decommissioning of Work Sites

185. Impacts arising during the construction and decommissioning process are temporary, generally short-term and intermittent. Nevertheless, they can be sources of potentially significant effects on environmental resources and residential amenity, and states as an important factor in planning

186. The EMP makes particular reference to prescribe good practices for the decommissioning of work sites, both the construction sites, the work camp, storage and stockpiling facilities, and the borrow pits. To achieve proper decommissioning of all work sites, the Contractors will be obliged to present their activities and solutions on the proper execution of such tasks as outlined in the SS EMP.

187. The decommissioning of work camp sites requires particular attention. Tidy clearing of all sanitary and waste management facilities, grade the soil to natural ground levels, re-establishment of natural vegetation and waterways are the focal points as these are often a source of environmental pollution and a public eyesore. Options need to be explored which would allow the use of workers dormitories, fuel station, workshops, drainage facilities etc. for other purposes as suggested by local leaders. Good landscaping is required to re-install former work camp sites into places where the local communities would meet the desired landscape aesthetics.

F.3 Operational Phase

F.3.1 Air Pollution

188. Traffic-generated air pollution is inherent to road projects, and can cause substantial health and other impacts to both the local human and biotic environment, many of them with a threatening potential for cumulative negative effects. On the other hand, the improved road conditions, less steep grades causing smaller amount of accelerations and decelerations, cause

less wear and tear to vehicles and smoother traffic flow. This will, in turn, also result in less fuel consumption and emissions.

189. Due to the anticipated increase in traffic volume, air pollution along the road is expected to increase. On the other hand, as only limited amount of settlements are located in close vicinity to the road the magnitude of these impacts on the human health is expected to be low.

190. To address potential impacts to air quality in this regard, possible mitigation measures include:

- (i) Setting up of an air quality monitoring system along the Project Area in accordance with acceptable standards;
- (ii) Further improvement can be made by enforcing the traffic laws and regulations to curb speeding and getting the vehicles tested, gaseous emissions, followed by mandatory technical clearance certificates;
- (iii) Strict enforcement of the regulation that no economic or settling activity takes place within the demarcated boundaries of the RoW. This refers particularly to the potential establishment of roadside vending shops and facilities.
- (iv) Should traffic intensity significantly increase, additional measures might be worth considering such as (i) enlarge and heighten the vegetation belts along the RoW in order to increase the absorptive function of roadside trees and hedges, and (ii) improving and strengthening the regional railway transport system to shift part of the cargo transport from road to rails

F.3.2 Noise Impacts

191. Noise during operation of road is expected to raise mostly due to the (i) replacement of the surface to concrete cement and (ii) increasing the traffic volume.

192. However, the impact will not be considerable due to the absence of any noise sensitive areas located close to the road, feasible effective measures to enforce suggested speed limits, and planting vegetation belt between the road and settlements.

F.3.3 Hazardous Material Spills

193. The change of the road speed and increase of the cargo traffics will impact on a possible risk of hazardous material spills that may cause long-term negative impacts on the existing environment including pollution of the valuable farm lands and irrigation channels.

194. Although the risk is extremely small since most such materials are transported by rail, the road operator will:

- (i) Insure that all trucks carrying hazardous materials are marked according to GoK norms;
- (ii) Enforce traffic controls;
- (iii) Set speed limits for trucks carrying hazardous material to maximum 85kph or according the GoK norms and codes;
- (iv) Assist South Kazakhstan Oblast to prepare a rapid spill response and clean up protocol so that in the event of a spill the appropriate people and equipment are quickly notified and action can be taken.

F.4 Cumulative impacts

195. Rehabilitation of the Shymkent-Tashkent road would primarily result in wide range of cumulative impacts. However most of them will be positive and associated with socioeconomic development of the South-Kazakhstan Oblast.

196. The proper implementation of the EMP would minimise any impact on local human and biotic environment that might be related with any long-term cumulative negative effects.

197. The project is planned to be implemented within ROW with no land acquisition and any impact on existing agricultural land, which suggests that cumulative land use issues would be minimized. However the proposed Project is expected to increase the local land values, especially in the vicinity of the city of Shymkent. Landowners will have an opportunity to sell their land at increased prices. Basically, this impact is estimated as a major long-term positive one that needs not be mitigated.

198. The FS and Detailed Design indicates the implementation of the project would result in significant job creation and tax base increase and help the region retain skilled workers. Cumulative impacts on regional and local socioeconomics would therefore be positive. In some extend involvement of local businesses in international trade sector could be improved.

G. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

199. Formal Public Consultation took place in a conference room of the school №24 in Shymkent on the 24 May 2012, started at 15:00 pm involving about 15 participants (list of participants provided in **Appendix 2**). The consultation was moderated by the deputy director of South-Kazakhstan region Department of the Road Committee, and assisted by Designer Company (KS Engineering). The public hearings were exclusively devoted to the discussion of the potential/anticipated environmental impact associated with the detailed design solutions for the CAREC 3 transit corridor Shymkent-Tashkent road Project section km 705-742 financed by the Asian Development Bank.

200. The Public Consultation was followed up by imitation of some informal meetings carried out in Rabat, Mambetov, Aktas and Akzhar villages. The Rabat meeting took part in the building of local administration (akimat) with 11 participants. Informal consultation in Mambetov was arranged in the local point of medical service of Mambetov village collected 12 people. The Aktas meeting was limited to conversations with local dwellers living close to the Project Road. The Akzhar meeting held in the building of local administration (akimat) with 18 participants. The lists of participants provided in **Appendix 2**.

G.1 Preparation Works

201. Preparation work started from consultative meetings held by ADB consultants with representatives of state authorities during the field survey in April and May, 2012. Important issues related to road constructions were discussed with the following agencies:

- (i) South-Kazakhstan Regional Territorial Road Department / MOTC;
- (ii) South-Kazakhstan Regional Department of Environment;
- (iii) South-Kazakhstan Regional Agency of Statistics;
- (iv) Department of State Sanitary and Epidemiological Supervision of South-Kazakhstan Region;
- (v) South-Kazakhstan Regional Territorial Department of Forest and Hunting;
- (vi) Local NGOs.

202. The following main stakeholders list was prepared based on personal consultations with above mentioned agencies:

- (i) Local communities, private persons: all local population, whose interests are likely/potentially are affected by the planned road reconstruction and related activities;
- (ii) Government and local government bodies: Local executive agencies – Akimats of the Sairam and Kazygurt districts; Territorial Roads Department of the Roads Committee of the MOTC in the South-Kazakhstan region in Shymkent; Housing and Communal Services Department in Shymkent; South-Kazakhstan Regional Department of Environment; Department of State Sanitary and Epidemiological Supervision of South-Kazakhstan Region; South-Kazakhstan Regional Territorial Department of Forest and Hunting;
- (iii) Representatives of the local civil societies: administrations of Shymkent, Sairam, Kazygurt districts and all villages located close to the Project Road;
- (iii) Representatives of the private sector: farm owners; private companies; local entrepreneurs.
- (iv) Other institutions: local NGOs, Designer Company involved in this Project, being: KS Engineering LLC and GeoData Plus LLC.

G.2 Contacting Stakeholders and Public Announcement of the Venues

203. The contacting of the stakeholders being invited for venues held in the Project Corridor was arranged by: Territorial Roads Departments of the Roads Committee of the MoTC in the South-Kazakhstan region in Shymkent; Local executive agencies – Akimats of the city of Shymkent, Sairam and Kazygurt districts; Akimats of Rabat, Mambetov, Aktas and Akzhar villages, Designer Companies, namely the KS Engineering LLC and GeoData LLC.

204. Respective announcement on the planned public hearing 24 June has been published in regional newspaper “Ontystyk Kazakhstan” № 68-69 dated to 4 May 2012. This newspaper is relevant for all persons living in the respective construction corridor, and it can be obtained on all local kiosks. In addition to this personal letters of invitation were sent to all responsible state agencies and NGOs.

G.3 Performance of the Public Venue

205. The public consultations provided detailed information on the planned project features its foreseen activities and pre-identified environmental implications. The following methodologies were applied to accomplish the public consultation:

- (i) **Speeches:** The deputy director of South-Kazakhstan region Department of the Road Committee made an introduction to the Project Road section;
- (ii) **Presentations:** Designers presented the Design Projects of the road by using technical presentations in Microsoft PowerPoint;
- (iii) **Public Discussion:** After presentations all participants could address their questions and individual concerns with their own suggestions to representatives of Local Authorities, Territorial Road Department of the Road Committee of the MOTC in the South-Kazakhstan region, Designer Company and GeoData Plus LLC.
- (iv) **Handout Information Album:** All participants were supplied by Albums (A3 format) containing the mostly technical information like general Project overview; main technical features of the road; maps and summarized designer drawing solutions.

206. Informal meeting were arranged as free discussions initiated by representative of the RC and with active participation of Design Engineer and ADB consultants.

207. Lists of participants and munities of the public consultation and informal meetings in hand of the Project Proponent (Road Committee of MOTC South-Kazakhstan region). The lists of participants contain information on full names, profession and institutional affiliation, contacts and signatures (**Appendix 2**).

G.4 Comments Received & Response

208. The results of public consultation and informal meetings indicates that the concerns and questions received from the side of local stakeholders related primarily to:

(i) Sourcing of construction materials

Representatives of local NGOs asked about possible establishment of new soil reserves along the new Project Road section.

Representative of Designer Company assured that as stated in Design documentation, there is no need of opening new soil reserves due to the fact that calculated amount of excavated ground (620.000 m³) is two times more than needed amount for filling (230.000 m³).

(ii) Distribution of information

Most of the officials participated in the PC requested a distribution of all official information on the current on going activities on the Project and shared their concerns about monitoring of the road construction. There were also proposals on distribution of information about the project,

like a summary in a hard copy which can be accessible to the public places, such as Akimat and libraries, including school.

Representative of RC announced that the final version of EMP and grievance mechanism will be translated into Kazakh and Russian language and distributed to all public information centres like akimats, local libraries and schools and RC will be involved in the monitoring process of road construction.

(iii) Cattle passages.

The results of informal meetings with local residents showed that there is no need in establishment of new cattle passages. However *administration of the Rabat village* asked to consider possibility of enlargement of the cattle passage at km 735+700 and to make it combined with agricultural machinery passage.

As reported by Design Engineer possible technical changes on enlargement of the existing cattle passage at km 735+700 will be included in the final Design documentation in order to provide the open it for agricultural machineries.

(iv) Safety during the operation.

Most of the village dwellers proposed installation of waste containers, toilets and communication posts within new bus stops and rest areas. The bus stops were asked to be supplied with lightning system. Integration of the fire protection measures was indicated as significant issue especially close to the Kazygurt pass. *Also local drivers* proposed to make Kazygurt pass more save for driving by means of the elimination of the road incline. According to the information given from local akimat of Rabat there are many cases of road accidents registered near the Kazygurt pass.

Representative of Designer Company said that all issues will be covered by the final Design documentation: all bus stops and rest areas will be supplied by toilets, waste containers and communication emergency posts and elimination of the bus stops will be introduced. Also he replied that Kazygurt pass road section is planned to be rehabilitated including decrease of the existing slope.

(v) Local communities' utilities

People participated in the informal meetings raised their concern about possible impact on their community infrastructure, particularly water supply pipelines and power transmission lines. In addition to this village dwellers of Rabat were interested in technology to be applied for rehabilitation of Kazygurt pass section. They were interested in necessity of traffic diversion and bypass roads arrangement with respect to local community representatives expressed their awareness on possibly considering their local road passing through their community as a potential temporary bypass as there are vary social facilities such as school local on the road.

Design Engineer emphasized that no engineering infrastructure will be impacted and the technology of the rehabilitated road construction will be implemented by preservation of one part of the road in operation.

(v) Local communities' health, possible social and economic benefits

Representative of the medical station asked to consider measures to reduce dust pollution during the construction stage due a large number of local people suffering from respiratory diseases (asthmatics). The local unemployed people asked if they can be employed and to be involved in construction works. PC participant were interested in new surface of the road and the decision of construction of the concrete-cement roads.

Representative of Designer Company assured that all mitigation measures are developed in the local EIA. Decision on replacement of old asphalt surface to concrete was taken based on its longer service capacities.

Representative of the RC team replied that their expectation that most of the local people will hired by Construction Company so that they can gain social benefits.

(vi) Local cultural heritage

Informal meetings' participants asked to assure that no damage of their local monuments like local visiting sites (Noah's Ark) and artificial animals and birds. They also mentioned an importance and local value of the some installations like memories of victims of the road accidents.

As reported by *Representative of Designer Company* all construction works are planned to be implemented within ROW and no object of local value will be impacted.

(vii) Land acquisition.

Participant of PC inquired if any permanent land acquisition will be needed for the construction of the Project Road.

Official of RC No permanent land acquisition will be required for the project.

(viii) Grievance mechanisms.

NGO representatives asked about the issues of potentially affected people will be solved.

RC representative explained that currently Kazakhstan Government (MOTC) is considering development and approval of new grievance mechanism with participation of local NGOs.

G.5 Planned Information Disclosure

209. 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 prior to Board consideration of the Project. The ADB's Environment Policy requires disclosure of Initial Environmental Examination (IEE) reports to the public.

210. The Contractor will be contractually obligated 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.

211. As to the preoperational works done on the pre-construction design stage, the results of the Public Consultation and meetings will be published in a local newspaper.

H. GRIEVANCE REDRESS MECHANISM

H.1 Grievance redresses levels

212. According to the Kazakhstan legal and administrative framework for the implementation of Grievance Procedures is under the responsibility of local administrations (Akimats) and representatives of Project Proponent (RC of South-Kazakhstan region). Appointive officials have been designated at these levels to receive, help resolve, report or forward complaints received from Affected Persons (APs) and the general public. However, due to the lack of capacities at the local level (usually local villages' akimats consist of 2 or 3 people) some affected people may still remain dissatisfied. Many grievances at local level arise due to inadequate understanding of project policies and procedures, and can be promptly resolved by properly explaining the situation to the complaining person at the site. The efforts will therefore be to first seek resolution of these grievances at the local level through the mediation by Grievance Coordinators appointed at Construction Supervision Consultant and CoR, as well as by involving designated officials at local community, rayon and oblast levels. In addition, the NGOs may serve as informal mediators to facilitate grievance resolution process.

213. The Grievance resolution process will follow the steps defined below:

- (i) First, complaint resolution will be attempted at the level of Construction Supervision Consultant (CSC), which will be required to nominate a Grievance Coordinator to receive complaints, provide explanation to APs regarding their particular case, record complaints in a special forms and attempt to resolve them on spot. If the complaint can be immediately resolved Grievance Coordinator of CSC shall inform aggrieved parties about the development of their grievance and decision made with respect to their case. If the case remains unresolved, it is passed to the CoR for review and resolution. In addition, the APs dissatisfied with the attention paid by Grievance Coordinator of CSC may also refer to the Grievance Coordinator of CoR to resolve their case. In case, the grievance is related to serious violation of procedures / requirements or is associated with an incident, Grievance Coordinator of CSC shall also immediately notify CoR in written.
- (ii) At the second level, complaint resolution will be attempted at the CoR, which will also be required to nominate a Grievance Coordinator to receive complaints, consult with Construction Supervision Consultant and APs and will search for possibilities to resolve the complaint within one-week period. At the end of one-week period Grievance Coordinator of CoR shall inform aggrieved parties about the development of their grievance and decision made with respect to their case.
- (iii) If the complain remains unresolved after being considered at the CoR level, APs take their complaints to the head of Local Self-Government (Akimat of Community), who registers the complaint and attempts to resolve it. If the complaint is not resolved in one-week period (with involvement of complaining parties, relevant entities and informal mediators - such as representatives of civil society / NGOs), it is passed to the Rayon Administration (Akimats of Shymkent town or Sayram, Tolebi, Kazgurt Rayons).
- (iv) A designated person in the Rayon Administration receives the complaint, registers it and attempts to resolve it. If there is no resolution in two weeks, it is passed to the Oblast Administration / Committee of Roads of the MoTC.
- (v) A designated person at Oblast level / Committee of Roads of the MoTC receives the complaint and attempts to resolve it within two weeks. As part of the process of resolving the complaint the Oblast Administration / Committee of Roads of the MoTC must convene a grievance redress committee that includes representatives of Government, professional organizations (design firm, etc.), independent parties (academic organizations, NGOs) as well as a representative of the complaining party.
- (vi) If there is no resolution within two weeks, the case will be presented to a Kazakh court and resolved according to Kazakh legislation, with the covenant, that for all

project related land use, social and environmental issues the specific agreements between Government of Kazakhstan and ADB will supersede national law.

H.2 Grievance Coordinators and Focal Points, Complaints Recording and Reporting

214. In addition to the appointment of the Grievance Coordinators of CSC and CoR, Grievance Focal Points will be designated at community, rayon and oblast levels to receive, help to resolve, report or forward complaints received from APs and the general public.

215. APs or other concerned individuals may visit, call or send a letter or fax to any of the Grievance Focal Points to register their comments or complaints related to land use, social and environmental aspects of the project (including but not limited to disturbance created to the traffic, noise, intrusion to the territory, etc).

216. Grievance Coordinators of CSC and CoR, Grievance Focal Points at community, rayon and oblast levels will maintain a record-book to register complaints, keep track of their status. Complaint forms will be available at these entities to facilitate recording of complaints. The information of grievance resolution will be summarized in progress reports to be submitted to ADB.

H.3 Disclosure of the Grievance Process

217. All contact details of designated officials and a clear description of the grievance mechanisms will be published in print media, distributed via brochures, posted on the MoTC website. Grievance redress mechanism will also be presented during the public consultations and informal meetings at Project area. Association of NGOs (named "Civil council") active in the South-Kazakhstan Oblast can also serve as a tool to disseminate information about grievance redress procedure and facilitate awareness rising in the Project area. The information on grievance resolution process will also be made available at the CSC, CoR, as well as at the offices of designated officials at community, rayon and oblast levels.

I. ENVIRONMENTAL MANAGEMENT PLAN

218. The Environmental Management and Monitoring Plan, presented separately in **Appendix 3**, aims to assist the local road and transport authority (MOTC and the RC of South-Kazakhstan region) in adequately addressing the foreseen adverse environmental impacts of the Project, in enhancing the Project's overall benefits and introducing standards of good environmental practices.

219. To ensure that the proposed mitigation measures will be carried out by the contractors during the construction stage, the Project Proponent will undertake the following:

(i) clearly set out in the tender and contract documents the contractor's obligation to undertake environmental mitigation measures as specified in the Environmental Mitigation Plan in **Appendix 3** (to be appended to Contract specifications);

(ii) the cost for the recommended environmental mitigation measures will, where possible, be made separate items in the Bill of Quantities. Such allocation of a separate budget for carrying out environmental mitigation measures will be crucial to assure their ultimate implementation. During procurement, contractors will be specifically encouraged to include these costs in their rates and present the mitigation cost as a line item in the Bill of Quantities; and

(iii) explicitly require the contractor to recruit an environmental specialist. The contractor will be responsible for the implementation of environmental mitigation measures during construction and shall employ an environmental specialist who will supervise implementation of the contractor's environmental responsibilities and coordinate with the RC and MOTC. The contractor, in coordination with RC (MOTC), shall set-up a grievance redress committee that will address any complaints during project implementation. During project implementation, the RC shall monitor the compliance of the contractor with the EMP provisions. The RC shall provide quarterly reports to MOTC and the ADB regarding the status of implementation of mitigation measures by the contractors, additional mitigation measures that may need to be implemented, incidents of non-compliance with applicable environmental permits, complaints received from local residents, NGOs, etc. and how these were addressed.

220. It is proposed that the construction supervision consultants (CSC) employ an environment specialist (with civil engineering/environmental management background) to assist the environmental supervision (ESC).

221. During project implementation, the MOTC (through the RC) will report to the ADB every month on the progress of the project by submitting progress report based on the monitoring report submitted by the ESS/CSC and the contractor.

222. Upon Project completion, the RC will be in charge of the operation and maintenance of the Project Road. Routine and random monitoring will be undertaken by RC district offices as scheduled in the monitoring plan.

I.1 Institutional Strengthening

223. There is often a gap between the preparation of the EMP and incorporation of the requirements for environmental mitigation and monitoring in the contract documents. This in turn leads to a lack of proper enforcement since the objectives and procedures for attaining those objectives are not clearly stated in the contract. Therefore, it is recommended that training under the construction supervision contracts concentrates on raising the level of awareness and practical skills of the RC on these aspects.

224. The proposed Terms of Reference of the International Environment Specialist (CSC) who will conduct the RC training and orientation for contractors is as follows:

(i) review prevailing government regulations and ADB guidelines governing the assessment and management of environmental impacts of road projects;

- (ii) identify the procedures and tasks required to be performed by RC to meet the requirements of these regulations and guidelines;
- (iii) review the skills of the local representatives of RC and assess the need for training to establish the capability to meet requirements for conducting environmental monitoring and implementation of mitigation measures of road projects;
- (iv) prepare a short-term staff training plan and associated materials to meet immediate needs;
- (v) undertake training workshops that will include the following topics:
 - preparation of EMPs and incorporation of associated requirements in contract documents and specifications for Consulting Services and Works contracts;
 - procedures for monitoring implementation including target parameters, frequency, responsibilities and means of monitoring; health and safety procedures;
- (vi) conduct orientation/workshop for contractors on construction-related environmental issues on road projects, implementation of mitigation measures and monitoring, and preparation of monitoring reports;
- (vii) evaluate the effectiveness of the training measuring improvements in attitudes and skills achieved through a combination of feedback questionnaires and performance evaluation; and
- (viii) prepare outline proposals for the longer-term organizational and capability development of local sub-divisions of RC in South-Kazakhstan region.

225. The training program would typically be delivered through short classroom training followed by more intensive on-the-job training site visits where relevant RC staff would participate directly with the international environmental specialist/construction supervision staff in reviewing the Contractors submissions, carrying out periodic monitoring inspections, attending meetings on environmental issues with the Contractor and other stakeholders, and environmental reporting.

226. The training site visits would be timed to coincide with peak work activity in order to provide a good cross-section of monitoring activities typically including visual inspection of:

- (i) discharges to watercourses;
- (ii) dust suppression;
- (iii) exhaust emissions;
- (iv) noise abatement measures;
- (v) protection against oil spillage;
- (vi) site health and safety, sanitary facilities, etc.;
- (vii) public safety, traffic management, child safety, etc.; and
- (viii) documenting and dealing with public complaints.

I.2 Cost Estimates for Mitigation and Monitoring Activities

227. The total mitigation and monitoring cost for this Project (Table -15) is estimated to be USD 1.15 million. This amount includes all mitigation, monitoring and capacity building activities, and all expenses related to environmental aspects for construction works.

228. The cost table contains a number of additional costs that should be included in the construction budget, like dust depression, planting of trees and storage and reuse of soil. Accordingly, these additional costs are not included in the available Design Documentation (June 2012) made by the Design Company.

229. Training sessions and public campaigns are also integrated in the cost estimate and shown in detail in the Table -16.

Table -15 Environmental Cost Estimate of the Project

| No. | Activity /Item | Unit | Number of Units | Cost per Unit, US\$ | Cost per Activity, US\$ |
|-----|--|----------------|------------------|---------------------|-------------------------|
| 1. | Environmental Costs – Civil Works (included in contractor's civil work package) | | | | |
| 1.1 | Dust suppression measures | days | 300 | 50 | 15,000 |
| 1.2 | Planting of trees | tree | 6,488 | 30 | 194,640 |
| 1.3 | Stripping of top soil and storage for reuse | m ³ | 390,000 | 2 | 780,000 |
| 2. | Environmental Monitoring | | | | |
| 2.1 | Soil Tests | Soil sample | 38 x 3 | 75 | 8,550 |
| 2.2 | Air Quality Tests | point sample | 38 x 3 | 300 | 34,200 |
| 2.3 | Noise Tests | point sample | 38 x 3 | 30 | 3,420 |
| 3. | Training and Awareness | | | | |
| 3.1 | Capacity strengthening of RC staff | 4 days course | <i>see below</i> | <i>see below</i> | 6,270 |
| 3.2 | Public Campaigns, 50 person | day event | 4 days | 1.750 | 7,000 |
| | Sub-Total US\$ | | | | 1,049,080 |
| | Contingencies 10% | | | | 104,908 |
| | Total US\$ | | | | 1,153,988 |

Table -16 Cost Estimate for proposed Environmental Safeguard Training Activities

| No. | Activity /Item | Unit | Number of Units | Cost per Unit, US\$ | Cost per Activity, US\$ |
|-----|---|----------|-----------------|---------------------|-------------------------|
| 1. | Remuneration of EC | days | 6 | 400 | 2,400 |
| 2. | Per diem of EC | days | 6 | 50 | 300 |
| 3. | Local travel and accommodation of EC | days | 5 | 80 | 400 |
| 4. | Local Interpreter | days | 6 | 100 | 600 |
| 5. | Field visits | days | 2 | 500 | 1,000 |
| 6. | Preparation of training materials, Certificates and Reporting | lump sum | | 1,000 | 1,000 |
| | Sub-Total US\$ | | | | 5,700 |
| | Contingencies (ca 10%) | | | | 570 |
| | Total US\$ | | | | 6,270 |

J. CONCLUSIONS AND RECOMMENDATIONS

230. The Project will have some negative and positive environmental impacts on physical, ecological and socio-economic environment during road construction and operation phases. As there are no environmentally sensitive areas in the Project Area, no substantial negative ecological impacts are warranted. The road corridor already exists and this is an upgrading project. Temporary environmental impacts are anticipated during construction; they will be minimized by proper planning, good engineering design and implementation of the proposed mitigation measures and monitoring programs and will not pose any threat to the environment.

231. The project is classified as Category B and as implemented environmental assessment shows, the project likely to have no significant effects on the existing environment. Due to this fact no additional environmental examinations or development of EIA is required.

232. The total environmental cost estimate makes the sum of USD 1.16 million that equals to 0.9 % of the total project cost.

233. An Environmental Management and Monitoring Plans have been prepared, describing mitigative measures and monitoring actions to be undertaken during the pre-construction, construction and operating phases of the project.

234. The following recommendations are proposed based on the findings of the IEE:

(i) Environmental Provisions in Bidding and Contract documents. The Environmental Management and Environmental Monitoring Plans, which are part of the IEE, should be a part of the Bidding documents. The Bidding documents set out that the Contractor will be responsible for the implementation of the EMP through his Site Specific Environmental Management Plan that will be based on the EMP, and will incorporate site specific details that are not presently known. The EMP should then be added to the Contractors Contract, thereby making implementation of the EMP a legal requirement. Specific environmental provisions covered by EMP related but not limited to:

- (a) erosion control, air and water quality control,
- (b) location of asphalt plants, construction camps and other facilities (not in environmentally sensitive areas indicated above),
- (c) borrow pit restoration,
- (d) quarry operations,
- (e) safety provisions,
- (f) baseline and routine monitoring of noise and vibration levels in settlements;
- (g) baseline and routine monitoring of air quality, water quality, and ecosystem health, and
- (h) community relations;

(ii) Environmental Monitoring and Control. Baseline air quality and noise monitoring is recommended in the city of Shymkent, Aktas and Mambetov villages at the preconstruction stage as well as consideration of the relevant mitigation measures during detailed design.

(iii) Capacity Building for Environmental Management. A training program for selected staff of the PIU and addressed to the goals and techniques of environmental management activities in road projects is strongly recommended.

Typical cross sections of the road

Type 1 with embankment up to 1 meter



Type 1 with embankment up to 3 meters, with separated roadways of different directions

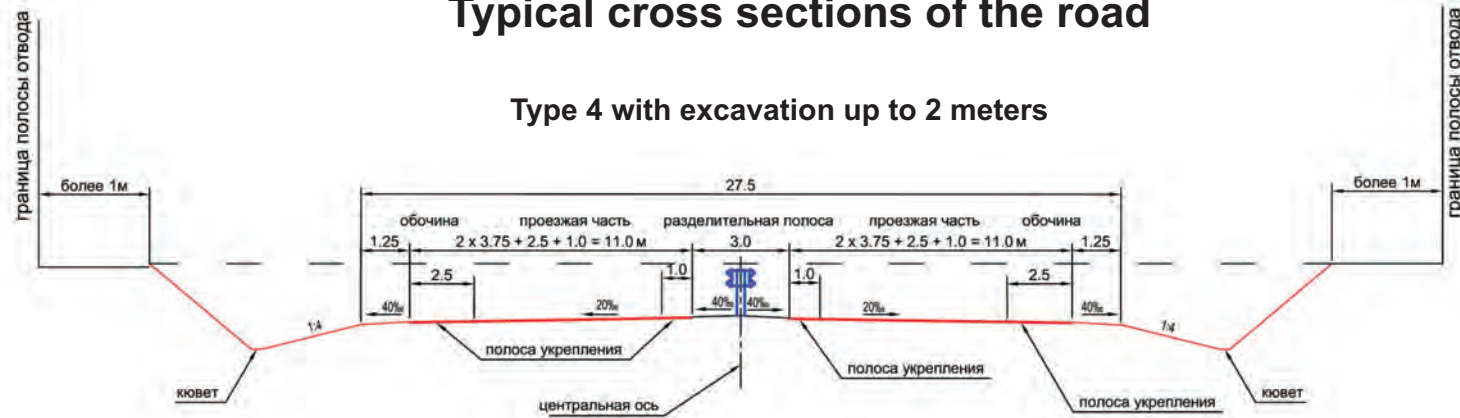


Type 1 with embankment up to 3 meters,

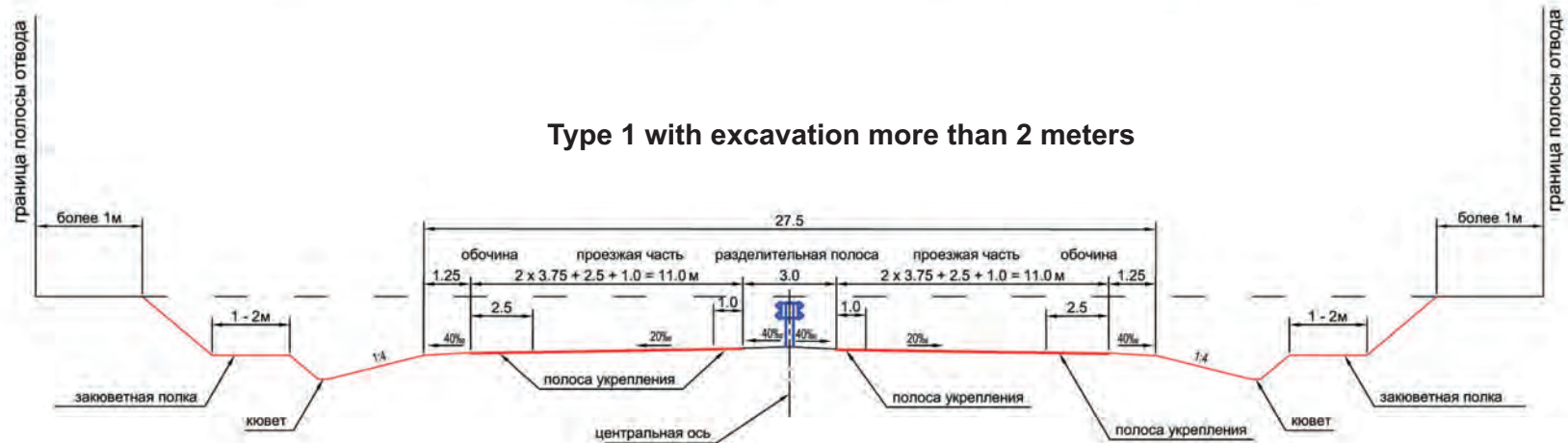


Typical cross sections of the road

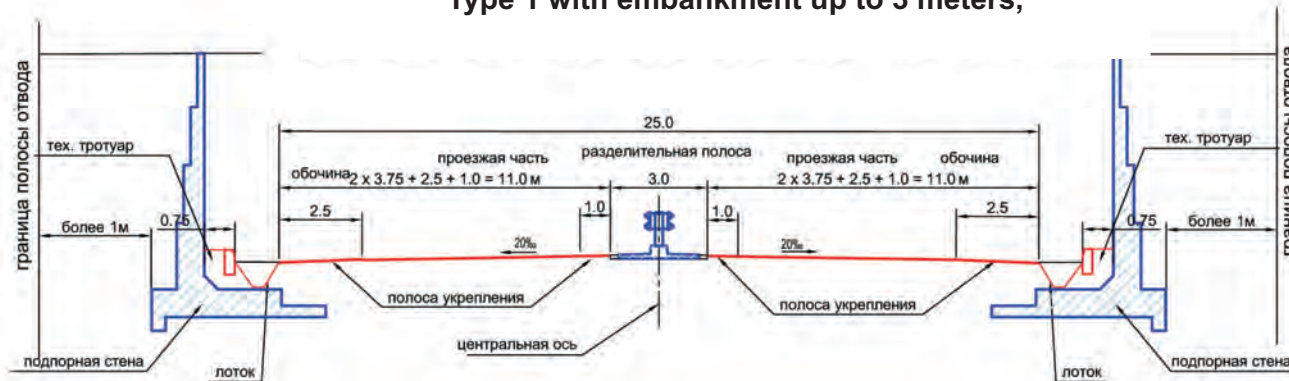
Type 4 with excavation up to 2 meters



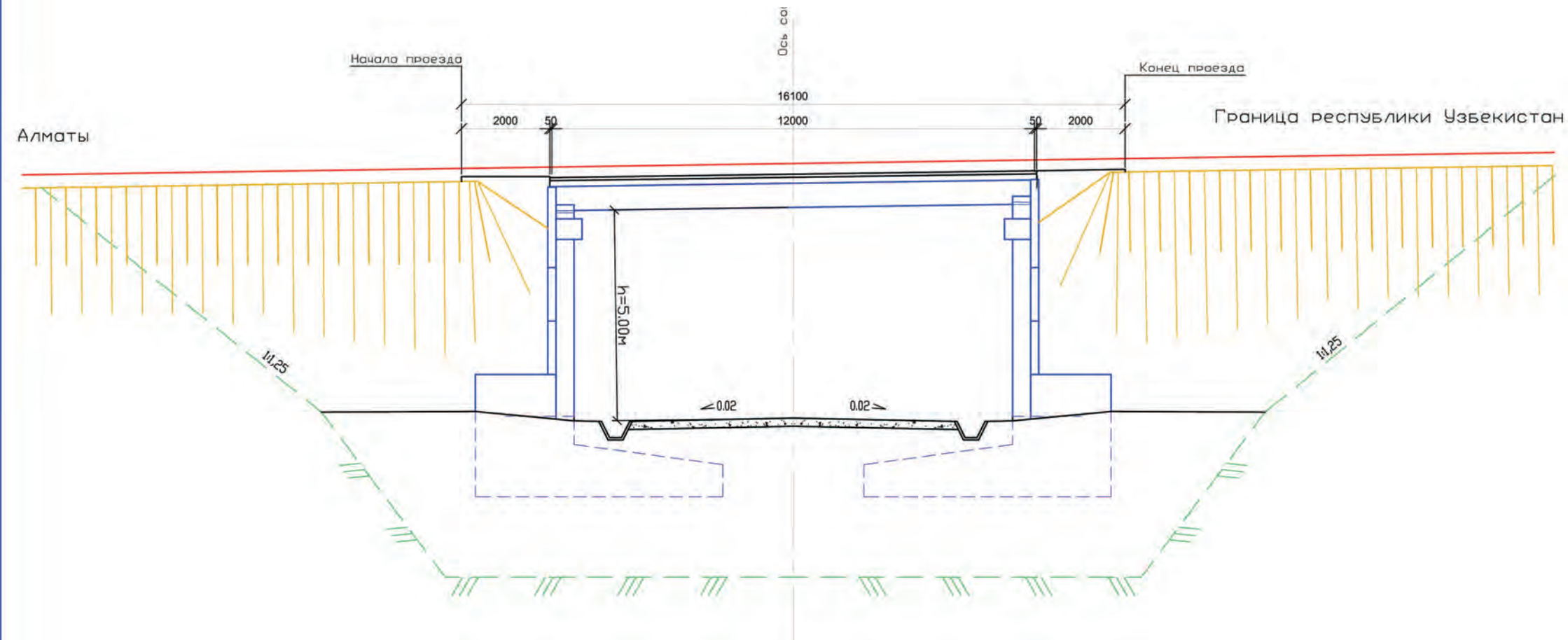
Type 1 with excavation more than 2 meters



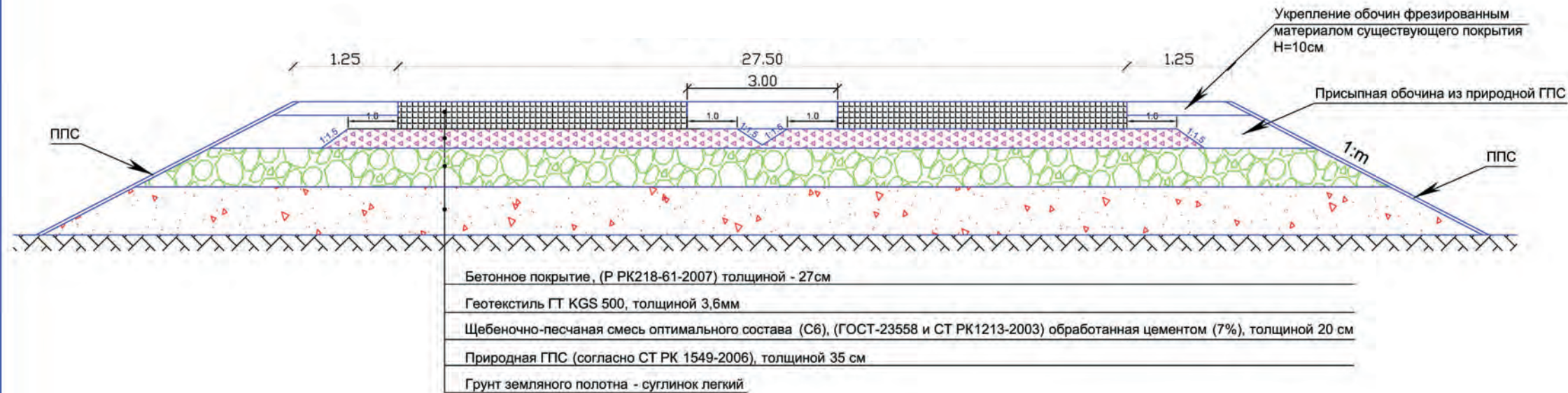
Type 1 with embankment up to 3 meters,



The cross section of the cattle passage combined with agricultural machinery passage



The design of the rehabilitated road pavement



List of Participants of the Consultations for CAREC Corridor 3 (Shymkent – Tashkent) Improvement Project
Список участников консультаций по проекту Улучшение ЦАРЭС коридора 3 (Шымкент – Ташкент)
(Шымкент-Ташкент) ЦАРЭС-тің 3 дәлізі жоспары бойынша кездесу қатысушылар тізімі

Rabat 10⁰⁰ a.m., June 6, 2012
Rabat

Rabat 10⁰⁰, 6 июня 2012 года

Rabat 10⁰⁰ 6 маусым 2012 ж.

| № | Name, Surname Ф. И.О. А.Т.Ж. | Occupation Место работы Жұмыс орны | Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс ақпарат (тел., эл. мекен-жайы) | Signature Подпись Қолы |
|-----|------------------------------------|--|---|------------------------------|
| 1. | Вознебаев Дрозды Степан | Ақша с. Рабат | 8-725-38-34-1-01 | <i>[Signature]</i> |
| 2. | Қостанов Сая | Ақсақал - жемісші с. Рабат | Рабат Жауаһир көшесі 36 үй. т. | <i>[Signature]</i> |
| 3 | Қасқабас Әлігер. | Ақсақал - фермер с. Рабат | Рабат. Баймырзаев 34 үй. | <i>[Signature]</i> |
| 4 | Алиев Күрбан | с. Рабат | Рабат Әбдішев к. | <i>[Signature]</i> |
| 5. | Қошымбаев Дәлет | Экономика с. Рабат | Рабат Абдышев. 23 | <i>[Signature]</i> |
| 6 | Коров Павел Яковлевич | с. Рабат | г. Ташкент А. Маматова абп. ун. Пушкина 44 б. | <i>[Signature]</i> |
| 7 | Симонов Армен | АБР, консультант | 8-775-5631129 armine@simonovs.com | <i>[Signature]</i> |
| 8. | Джунгулов Мурад Ахмедов | Консультант АБР | 8777 139 3766 mcny@rambler.ru | <i>[Signature]</i> |
| 9. | Момтасаров Нурбол. | ДКАД МТК. | 8 701 555 3838 | <i>[Signature]</i> |
| 10. | Саханов Дархан | ДКАД МТК | 8 702 329 01 04 | <i>[Signature]</i> |
| 11 | Сергеев Кемел | Консультант АБР | 87057217024 | <i>[Signature]</i> |

List of Participants of the Consultations for CAREC Corridor 3 (Shymkent – Tashkent) Improvement Project
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(Шымкент-Ташкент) ЦАРЭС-тің 3 дәлізі жоспары бойынша кездесу қатысушылар тізімі

K. Mambetov 11³⁰ pm, June 6, 2012

Қ. Мамбетов 11³⁰, 6 июня 2012 года

К. Мамбетов 11³⁰ 6 маусым 2012 ж.

| № | Name, Surname Ф. И.О. А.Т.Ж. | Occupation Место работы Жұмыс орны | Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс ақпарат (тел., эл. мекен-жайы) | Signature Подпись Қолы |
|-----|------------------------------------|--|---|------------------------------|
| 1 | Кушербаев Аширбай | участник ж-з | 38-4-94 Қ. Мамбетов | <i>[Signature]</i> |
| 2. | Доудиябаев Азамбай | Кауноч | 38-033. Қ. Мамбетов | <i>[Signature]</i> |
| 3. | Жаманаров Илмур | Козахабзадор. | 38435 Б. Мамбетов аял. | <i>[Signature]</i> |
| 4 | Қошкарров Ерубай | Зейметкер | 38-080 Қ. Мамбетов | <i>[Signature]</i> |
| 5 | Назбаев Камап | СТК торатес | 38-3-07 Қ. Мамбетов | <i>[Signature]</i> |
| 6 | Станкулова Ажман | мұғалім | 38-6-05. Қ. Мамбетов | <i>[Signature]</i> |
| 7. | Станкулова Гүлжан | кітапханаша | 34-2-14. Қ. Мамбетов | <i>[Signature]</i> |
| 8. | Қазиева. Гүлжамат. | Мейрбике. | 38.-5-47. Қ. Мамбетов | <i>[Signature]</i> |
| 9 | Баймурдинова Расит | Зейметкер | 38-747 В. Мамбетов | <i>[Signature]</i> |
| 10. | Момтасаров Нурбол | ДКАД МТК. | 8 701 555 3838 | <i>[Signature]</i> |
| 11. | Саганов Дархан | ДКАД МТК | 8 702 329 0104 | <i>[Signature]</i> |
| 12 | Сергеев Илья | Консультант КБР | 880 5722 7074 | <i>[Signature]</i> |

1)

List of Participants of the Consultations for CAREC Corridor 3 (Shymkent – Tashkent) Improvement Project
 Список участников консультаций по проекту Улучшение ЦАРЭС коридора 3 (Шымкент – Ташкент)
 (Шымкент-Ташкент) ЦАРЭС-тің 3 дәлізі жоспары бойынша кездесу қатысушылар тізімі

Akzar 15⁰⁰ pm, June 6, 2012

Актар, 6 июня 2012 года

Актар 6 маусым 2012 ж.

| № | Name, Surname Ф. И.О. А.Т.Ж. | Occupation Место работы Жұмыс орны | Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс ақпарат (тел., эл. мекен-жайы) | Signature Подпись Қолы |
|-----|------------------------------------|--|---|------------------------------|
| 1 | Муманов Мурзагали | песенер | Токбергенов, 10. 284618 | |
| 2 | Қожабаев Мумабай | мұжескис | Молдигулова 11 284604 | |
| 3 | Доджабаев Ахмет | песенер | Актар ^{Карауыл} 2161 | |
| 4 | Сихамбаев К. | песенер | (Актар) ^{Засов} Мұжтар | |
| 5 | Тоғдыров Р. | молдирис | Актар. 80. Молдигулова | |
| 6 | Билалов Мурзабай | еңбек ардагері | Актар. Төлеби рн. Д.5 | |
| 7 | Билалов Шолпан | сұраш | Мұрабаева. | |
| 8 | Аббаева Батира | мұжескис | Актар аудан м. Мометов-8 | |
| 9 | Надирбекова Жансая | мұжескис | Ақсар аудан Оркен N5 | |
| 10 | Шоламова Магарип | мұжескис | Актар аудан Достар N2 | |
| 11. | Момтасаров Н. | ДКАД МТК | | |
| 12. | Саханов Д. | ДКАД МТК | | |

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Ақжар 5 маусым 2012 ж.

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Aktas 13⁰⁰, June 6, 2012

Актос 13⁰⁰, 6 июня 2012 года

Ақтас 13²⁰ 6 маусым 2012 ж.

| № | Name, Surname Ф. И.О. А.Т.Ж. | Occupation Место работы Жумыс орны | Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс акпарат (тел., эл. мекен-жайы) | Signature Подпись Қолы |
|---|------------------------------------|--|---|------------------------------|
| 1 | Камбаров Э | мухалим Разогурт р-н | 87059545284, 87756845374 | Камбаров |
| 2 | Жакиров Ф | водитель | Актас 8/н | Жакиров |
| 3 | Калмуратов Б | водитель | Актас | Калмуратов |
| 4 | Джугужов М.А | Компьютерист АБР | 87771393766 mengu@rambler.ru | Джугужов |
| 5 | Соканов Дорхан | ДКАД МТК | 87023292104 | Соканов |
| 6 | Сералиев Кенет | консультант АБР | 87057227074 | Сералиев |
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(Шымкент-Ташкент) ЦАРЭС-тің 3 дәлізінің жоспары бойынша қоғамдық тыңдаудың қатысушылардың тізімі
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О. Жандосов көшесі, № 24 мекте






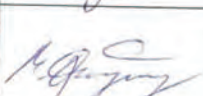

O. Zhandosov str. school №24

ул. О. Жандосова, д. №24, шк № 24

Шымкент қаласы, 24 мамыр 2012 ж.

Shymkent, May 24, 2012

Шымкент, 24 мая 2012 года,

| № | А.Т.Ж. Name, Surname Ф.И.О. | Байланыс ақпарат (тел., эл. мекен-жайы) Contact details (phone, e-mail) Контактные данные (тел. эл.адрес) | Жынысы (Е ж/е Ә) Пол (М и Ж) Gender (M & F) | Тұрғылықты жері Место жительства Residence | Жұмыс орны Occupation Место работы | Лауызымы Должность Position | Қолы Signature Подпись |
|----|-----------------------------------|--|---|--|--|--|---|
| 1. | Исаев Бақыржан Мейіртәйіров | +77017811768 | еркек | Шымкент к. А.А. Рабаев 4-ф | АО КАР | мен. басқ. |  |
| 2. | Жулиманов Аидар | 53-95-61-раб | муж. | қ.А. Аманбаева 195 кв 60 | Чар-2 сель- ского хоз-ва ЮКО | кавалер офиса |  |
| 3. | Б. Сүлеймов | 214463 раб. | еркек | к.р. Нуров 155-21 | Упр. природн. наст. ресурсов ЮКО | отр. |  |
| 4. | Сенсенов Арсемен | +7-775-5631129 | еркек | — | АБР/АБР независимый | independent consultant независимый |  |
| 5. | Кулимова Айгерме | +7-701-799-5408 | еркек | 2 Аман | ТОО "Борда Плюс" | ген. директор |  |
| 6. | Джунусова Мадина | 87771393766 | мен. | Аман | Корпоратив АБР | эксперт |  |
| 7. | Коров П.И | 8-7017290346 | муж. | 1. Ташкент Р.М. ОДА | ТОО "Силанс Кирмиз" | инженер |  |

(Шымкент-Ташкент) ЦАРЭС-тің 3 дәлізінің жоспары бойынша қоғамдық тыңдаудың қатысушылардың тізімі
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О. Жандосов көшесі, № 24 мекте

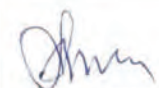
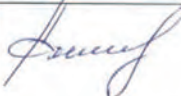



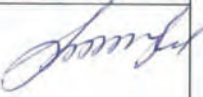
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| № | А.Т.Ж. Name, Surname Ф.И.О. | Байланыс ақпарат (тел., эл. мекен-жайы) Contact details (phone, e-mail) Контактные данные (тел. эл.адрес) | Жынысы (Е ж/е Ә) Пол (М и Ж) Gender (M & F) | Тұрғылықты жері Место жительства Residence | Жұмыс орны Occupation Место работы | Лауызымы Должность Position | Қолы Signature Подпись |
|----|---------------------------------------|---|---|--|--|-----------------------------------|---|
| 8 | Шамданбаев Серік | 8701 326 22 40 | М | Қазығұрт е.м. Мәкәтәев 42 | Ауд. НКХ | Бас маманы |  |
| 9 | Сақандаров Дархан Бүгдәтқалиұлы | 8702 32901 04 | М | 2 Шымкент | Областнай департамент КАД | зам. директора |  |
| 10 | Аширов Нурдәулет Абаевич | 8701 749 18 57 | М | 2 Шымкент мкр. СНМ 958 | ЮКО ДКАД МТУК РК | гл. спец. ПЭРиМ |  |
| 11 | Багманов Баглан Темиргалиевич | 8700 336 23 89 | М | 2 Шымкент | ЮКО ДКАД МТУК РК | вед. спец. ОЭи БД |  |
| 12 | Командаров Омарбек Самбакулович | 8701 478 88 44 | М | 2 Шымкент Жаңа-нас - 1 | ЮКО ДКАД МТУК РК | вед. спец. |  |
| 13 | Абдрахманов Жауһар Алибердиевич | 8775 658 47 50 | ер | Шымкент қ. Н.Мағ. ауд. 24н 1980.08.24н | ЮКО АНКХ | бас басшы |  |
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Environmental Management Plan:**PART A. Mitigation Measures for Identified Potential Impacts**

| A.1 PRE-CONSTRUCTION PHASE | | | | | | |
|---|---|--|------------------------------------|-----------------------------------|---|-------------------------------|
| Environmental Impact/ Issue | Mitigation Measures | Location | Time Frame | Responsibility | | Costs / Budget |
| | | | | Implementation | Supervision | |
| A.1.1 Bid documents prepared without access to or use of the IEE and particularly this EMP in a translated version | No bid documents will be prepared without the authors having incorporated a (Kazakh/Russian) copy of the mitigation and monitoring plan EMP, which shall be included in the safeguard clauses of the Technical Specifications in the contracts. | Shymkent, availability of documents at RC | Before bid documents are completed | Detailed Design Consultant and RC | MOTC and PMU with advice from MOEP | included in the Project Costs |
| A.1.2 Poor landscape aesthetics due to Design | Consider aesthetical roadside plantations as much as environmental conditions (e.g. water supply and availability of plants) allow | Near existing grade separated interchange at km 732+963 | at early design stage | Detailed Design Consultant | MOTC and RC | included in the Project Costs |
| A.1.3 Site selection for large construction camps, near or within existing settlements. Impact on public health and sociological setting | Proper site selection, observing criteria which primarily protect the public general. Observe a minimum distance (buffer zone) between camp site and nearest residential area. Observe local wind conditions to reduce nuisances. Work safety and environmental protection measures to be specified by the Contractor in a Site Management Plan (SS EMP). Planning for independent water and electric supply network and a medical service station at the site. | At selected camp site locations, wherever these are in close vicinity to settlements (especially Shymkent, Aktas, Akzhar, Rabat, Mambetov) | at early design stage | Designer | MOTC and RC | included in the Project Costs |
| A.1.4 Planning for structure demolishing and removal of utilities for widening the RoW | Provide for adequate and safe removal of demolished structures in certified dump sites. Plan for timely and fully functional substitution for any public utility that needs to be removed. Obtain certificates from local authorities. | At all locations where utilities need to be removed and substituted | at early design stage | Detailed Design Consultant | Local Authorities responsible for utilities | included in the Project Costs |

| Environmental Impact/ Issue | Mitigation Measures | Location | Time Frame | Responsibility | | Costs / Budget |
|---|---|---|---|---|-----------------------|---|
| | | | | Implementation | Supervision | |
| A.1.5 Road safety issues associated with pedestrian crossing | Planning for safe and adequate pedestrian crossing facilities that can be in most cases over passages equipped with ramps and structures that allow the use of wheelchairs, pushcarts, bicycles and prams. Planning for public awareness meetings | Near all close located settlements (especially Shymkent, Aktas, Akzhar, Rabat, Mambetov), bus stops and rehabilitated grade separated interchange | at early design stage shortly before works start | Detailed Design Consultant | MOTC and RC | included in the Project Costs |
| A.1.6 Road Accidents with livestock animals | Planning for suitable protective measures, as 1. Pre-consult with local people, to identify spots where mitigation measures are needed 2. Plan for animal (under-)passages, sufficiently dimensioned, taking into account specific behavioural aspects to allow safe use by different livestock species 3. Plan for strong animal fences along each side of an animal passage 4. Provide adequate length and strength of animal fences along the two established /planned protected areas | At 4 locations of existing cattle passages combined with agricultural machinery passages | Before the bid documents are completed | Detailed Design team – following field inspection and stakeholder consultation, and in consultation with the Environmental Department Units in Shymkent | MOTC and MOE, and CHF | included in the Project Costs / Civil Works |

A.2 CONSTRUCTION PHASE

| Environmental Impact/ Issue | Mitigation Measures | Location | Time Frame | Responsibility | | Costs / Budget |
|---|---|---|--|--------------------------------------|---|-------------------------------------|
| | | | | Implementation | Supervision | |
| A.2.1 Contractor fails to retain a ecological expert to prepare the SS EMP and to implement all mitigation and monitoring measures as specified in the EMP | As specified by law, contractor will be required to employ a licensed expert to prepare the SS EMP and obtain all relevant permits. The contractor will not be permitted to mobilize workers without an approved SS EMP and the appropriate permits in place. | Entire road section for which the SS EMP will be prepared | Prior to the start of the construction work. | Contractor | MOTC and PMU, Environmental Supervision Engineer | to be included in the Project Costs |
| A.2.2 Common issues related to operation of camp sites (environmental, social, security, public health, workers safety, sanitary, and waste concerns) | The contractor will be required to employ a licensed expert to prepare the SS EMP which will address all potential impacts identified in the IEE. Focal aspects are medical care, insurances, social welfare, work safety, good housekeeping practices, work hours, security, crime prevention, electricity and water supply, waste management, awareness training, grievance relief. | - as above - | - as above - | Contractor | MOTC and PMU, Environmental Supervision Engineer | to be included in the Project Costs |
| A.2.3 Large water extraction volumes for construction purposes and camps may lead to conflicts with local water users | Contractor/sub-Contractors must submit a plan for type, location and quantity of both drinking and technical water extraction. The plan needs to be approved and monitored by the responsible authorities. Prevent any illegal fishing in local rivers which would involve labourers. | At all locations where water extraction is planned (possible source is Badam river) | Throughout construction works. | Contractor (and all sub-contractors) | Local Water Authorities, RE, Environmental Supervision Engineer | to be included in the Project Costs |

| Environmental Impact/ Issue | Mitigation Measures | Location | Time Frame | Responsibility | | Costs / Budget |
|--|---|---|------------------------------------|---|--|---|
| | | | | Implementation | Supervision | |
| A.2.4 Contractor undertakes excessive, unauthorized or unnecessary tree removal or causes damages to ecologically vital vegetation at construction sites | The contractor is required to develop a sketch map of the location number and species of trees along the roadside that he intends to cut. Such plan needs to be screened by the Supervision Consultant and approved by the RE. The Contractor must develop a plan for replacing any removed tree or important vegetation, and engage the CHF in the intended replanting scheme, describing: species selection, minimum size, number of young trees per cut tree, maintenance for a specified time, replacement of unsuccessful replantation | Along any section of the road where trees are subject to the Contractor's discretion for removal | Prior to any clearing taking place | Contractor, with advice from the Oblast CHF | PMU, Environmental Supervision Engineer | to be included in the Project Costs / Civil Works |
| A.2.5 Sourcing of materials; Side borrow operations leading possibly to erosion, landslide and landscape deterioration. Impacts associated with stockpiling | Materials may only be excavated in authorized borrow pits. Contractors shall develop a borrow pit site management plan to ensure all precautions for avoiding environmental impacts. While not strictly forbidden, the practice of taking fill material from the side of the road, creating a landscape of craters shall not be acceptable unless complete landscaping and erosion control follows. Any such borrow areas should not intrude visually on the road, meaning it should be out of eyesight from the road with proper site re-contouring and replacement of topsoil. Provide adequate fencing to prevent unauthorized access to borrow sites. Provide for proper decommissioning plan for each borrow site. | At all rehabilitation sections where additional material is required from borrow pits; impact zones requiring special protection include the hauling roads. | Throughout the construction period | Contractor | MOTC and PMU, RE, Environmental Supervision Engineer | to be included in the Project Costs / Civil Works |
| A.2.6 Potential Impacts associated with the Asphalt Mixing Plant (AMP) | Choose operation site for AMP (as for crushers) at least 2 km away from the next human settlement, and always on leeward side with respect to prevailing winds. | At all construction sites nearby settlements (especially Shymkent, Aktas, Akzhar, Rabat, Mambetov) | Throughout the construction period | Contractor | RE, Environmental Supervision Engineer | included in the Project Costs |

| Environmental Impact/ Issue | Mitigation Measures | Location | Time Frame | Responsibility | | Costs / Budget |
|---|--|---------------------------|------------------------------------|----------------|--|-------------------------------|
| | | | | Implementation | Supervision | |
| A.2.7 Potential impacts associated with bitumen works | Avoid, all time, contact of bitumen with water and dust; Bitumen and solvents shall not be spilled on ground, ditches or water courses. If this happens, spills need to be removed immediately and disposed in a safe site that is protected from public access. No waste material shall be burned in connection with hot bitumen. All manual works while handling bitumen require special protective clothing (shoes and gloves). Bitumen works shall not be carried out in winter, rainy or stormy weather conditions. Trucks used for hauling asphalt mixture shall be adequately equipped. Surfacing works should not occupy more than one single traffic lane at a time. | At all construction sites | Throughout the construction period | Contractor | RE, Environmental Supervision Engineer | included in the Project Costs |
| A.2.8 Potential Impacts associated with concrete works | Avoid concrete works during windy, icy or very hot conditions. Aim at pre-cast solutions. Dust development at site can be managed by suitable covers (canvas) and/or water spraying. While working in streams casting concrete structures utilize cofferdams. Use spray waters for slowly curing and make all precautions to avoid contamination of adjacent surface or groundwater resources. Cover newly cast concrete surface with waterproof sheet material or sand to prevent moisture losses, and accelerate the curing process by using steam or radiant heating. While working with additives (e.g. anti-corrosive mixtures) special care needs to be applied, following the general and specific precaution prescriptions described in the Contractor's work safety guidelines. | At all construction sites | Throughout the construction period | Contractor | RE, Environmental Supervision Engineer | included in the Project Costs |

| Environmental Impact/ Issue | Mitigation Measures | Location | Time Frame | Responsibility | | Costs / Budget |
|--|--|--|------------------------------------|--|---|---|
| | | | | Implementation | Supervision | |
| A.2.9 Improper management of earthworks; transport and storage procedures, impacts caused by any activity generating dust and air pollution | <p>Large volumes of quarry rock, aggregate and sand will be transported and stored to work site. Hauling roads (dirt roads) need regular water spraying to contain dust development.</p> <ol style="list-style-type: none"> 1. Ensuring that the contractor's fleet of vehicles and diesel generators are properly maintained and tuned to prevent excessive pollution; inspection reports are submitted to the RE 2. Observance and control of specified haul loads; as and if necessary, upgrade the haul roads into all-weather road; 3. Documentation that the Contractor uses specified fuel for his fleet; 4. Use of dust suppressants (regular watering) 5. Vehicle operators must make provisions to cover trucks, particularly during windy conditions. 5. Truck and excavator operators must strictly observe specified speed limits being 30 km/hr near (100 m) or within settlements. 4. Vehicle idling time must not exceed 2 min. <p>All topsoil needs to be collected, stored in appropriate stacks, protected from wind and rain, and be fully re-used to rehabilitate/revegetate the areas disturbed and as specified by the RE.</p> | Anywhere where material is excavated and transported to/from sites of construction | Throughout the construction period | Contractor (being responsible for local sub-contractors) | MOTC and PMU / RE, Environmental Supervision Engineer | to be included in the Project Costs / Civil Works |

| Environmental Impact/ Issue | Mitigation Measures | Location | Time Frame | Responsibility | | Costs / Budget |
|---|--|--|---|--------------------------------------|--|---|
| | | | | Implementation | Supervision | |
| A.2.10 Improper management of petroleum products such as fuel, lubricants and bitumen, leading to spill and contamination. | <p>The Contractor/Sub-contractor will be required to have the following spill prevention measures in place at all work sites:</p> <ol style="list-style-type: none"> 1. All fuelling to be done on a concrete surface provided with spill catch tank that can be cleaned and all spilled fuel recovered and recycled based on discussions with fuel supplier. 2. All repair and maintenance work must either be done on a concrete surface with oil spill catch basin or oil catch pans must be provided at all service areas and training provided to all mechanics. 3. All fuel use areas where spills and leakage is possible, e.g. the generator, must have drip basins installed to pre-vent leakage. All recovered materials must be recycled. 4. A fuelling areas must be equipped with proper fuel nozzles and means for preventing accidental spills. 5. All bitumen handling must not permit any material from leaking to the ground, including transfer areas and any areas where bitumen is transported in drums. 6. Bitumen drums must be stored in a dry covered secure place where no leakage to water or ground is possible. Drums must be recycled at least once/yr. 7. Any spills must be cleaned up according to GoK norms and standards within 24 hours of the occurrence, with contaminated soils and water treated according to GoK norms and standards. Records must be handed over without delay to the RE. | At all construction sites, and within camps and storage facilities established | Throughout construction works, including decommissioning phase. | Contractor (and all sub-contractors) | MOTC and PMU, RE, Environmental Supervision Engineer | to be included in the Project Costs / Civil Works |

| Environmental Impact/ Issue | Mitigation Measures | Location | Time Frame | Responsibility | | Costs / Budget |
|--|---|--|------------------------------------|--|--|---|
| | | | | Implementation | Supervision | |
| A.2.11 Noise and vibration impacts, generated by construction activities, leading to health impacts and damages to structures | Contractor shall take all necessary steps to: 1. Selection of modern and well-serviced equipment and plants with reduced noise level ensured by suitable in-built techniques and appropriate silencing devices; .2. Confining excessively noisy work and movement of heavy machinery to specified daytime working hours (this relates especially to stone crushers, percussion hammers and pneumatic drills); 3. Work hours need observe special restrictions near residential and sensitive areas; 4. Providing the construction workers with suitable hearing protection (ear muffs); 5. Avoid vehicle idling. 6. Timely public announcements of works | At all construction sites, especially those located nearby settlements (especially Shymkent, Aktas, Akzhar, Rabat, Mambetov) | Throughout the construction period | Contractor | MOTC and PMU, RE, Environmental Supervision Engineer | to be included in the Project Costs / Civil Works |
| A.2.12 Failure to adhere to construction related good housekeeping practices, including solid and sanitary waste management | Contractors will adhere to standard good house-keeping practices as defined in the contract Terms & Conditions and Contract Specifications: 1. Management of construction waste and water 2. Equipment lubricants and fuel, including management and collection of waste oils and fuel particularly related to refuelling depots, maintenance areas and diesel generator sets 3. Sewage will require latrines or chemical toilets with complete clean up after the construction is complete. 4. Garbage will be collected and properly disposed, in accordance with GOK norms and codes 5. The contractor shall orient all construction workers and on the specific hazards of their work and will need to certify to that effect at the start of the construction period. 6. Once the site is no longer needed the contractor must fully decommission it, with emphasis on waste removal /clean up of any spills or hazardous materials plus any necessary revegetation. | All work camps, construction maintenance yards and any other areas operated by the contractor and involved in the project | Throughout the construction period | Contractor (including sub-contractors) | MOTC and PMU | to be included in the Project Costs / Civil Works |

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|------------------------------------|
| A.3 OPERATION PHASE |
|------------------------------------|

| Environmental Impact/ Issue | Mitigation Measures | Location | Time Frame | Responsibility | | Costs / Budget |
|---|---|--|--|---|-------------------------|----------------|
| | | | | Implementation | Supervision | |
| A.3.1 General traffic safety | Appropriate road signage, traffic monitoring and control, human capacity development, review of the driving license issuing system and a wise application of penalties seem to be the most likely responses. The installation of an early warning electronic and radio system in case of bad road conditions ahead may also considerably contribute to improve the road safety. Evaluate the introduction of publicly accessible, well-marked posts containing both an emergency (pay-free) telephone and a first-aid box with medical supplies, stretchers, bandages and other means for first assistance to road victims. To avoid misuses, these boxes shall be equipped with an electronic lock that can only be opened by prior telephone contacting to a nearby police station. | Emergency phone posts at bus stop/ rest areas and in the vicinity of the Kazygurt pass. | at the start of operations | RC, in collaboration with local Traffic police and local medical services | MOTC and Traffic Police | t.b.d. |
| A.3.2 Increased risk of pedestrian accidents within settlement areas due to improved roads, faster speeds and greater traffic volume | To manage these problems the operator will enforce speed limits through increased 'radar' surveillance, better and more frequent signage and increased speeding fines. In villages at crossing the owner will improve the signage and include amber lights were possible. As many town bypasses as possible are planned and should reduce project generated traffic through towns and villages. | Close to the close located settlements (especially Shymkent, Aktas, Akzhar, Rabat, Mambetov) and grade separated interchange | at the start of operations , at defined schedule | RC, in collaboration with local Traffic police and Environmental Agencies | MOTC and MOE | t.b.d. |
| A.3.3 Inadequate management of traffic-generated air pollution | Adequate signage and awareness measures forwarded by Traffic Police, to improve the flow of traffic, reduce deceleration- acceleration cycles and idling periods, all measures that will lead to the overall reduction in the emission levels, despite the predicted increase in the overall traffic volume. Consider air pollution test program. | Where applicable and required, nearby human settlements (especially Shymkent, Aktas, Akzhar, Rabat, Mambetov) | t.b.d. | RC, in collaboration with Environmental Agencies | MOTC | MOTC |

| Environmental Impact/ Issue | Mitigation Measures | Location | Time Frame | Responsibility | | Costs / Budget |
|--|--|---|--|--|--------------|-------------------|
| | | | | Implementation | Supervision | |
| A.3.4 Traffic-related noise development, affecting nearby human settlements. | Identify feasible and effective measures to enforce suggested speed limits. Within settlement areas, where soil and soil humidity conditions would allow, consider the establishment of natural noise barriers (hedges), based on a specific monitoring program | Before and after Kazygurt pass and all close located settling areas (especially Shymkent, Aktas, Akzhar, Rabat, Mambetov) | t.b.d. | RC, in collaboration with Environmental Agencies | MOTC | MOTC |
| A.3.5 Increased risk of hazardous material spills due to increased traffic volume and provision of larger capacity bridges and stronger road surfaces, inviting large trucks to use the road. | Although the risk is extremely small since most such materials are transported by rail, the road operator will: 1. Insure that all trucks carrying hazardous materials are marked according to GoK norms 2. Enforce traffic controls 3. Set speed limits for trucks carrying hazardous material to max. 85kph or according the GoK norms and codes. 4. Assist South Kazakhstan region to prepare a rapid spill response and clean up protocol so that in the event of a spill the appropriate people and equipment are quickly notified and action can be taken. | Close to the close located settlements (especially Shymkent, Aktas, Akzhar, Rabat, Mambetov) | Within the first year of the road being in operation | Road Operator, Traffic Police MOTC to arrange for District Contingency Plan | MOTC and MOE | MOTC |
| A.3.6 Potential spread of STDs and human trafficking | Commendable actions to curtail such impacts are: 1. Public awareness campaigns to address risks associated with human trafficking; 2. Increased controls on highway sections where girl traffickers are reported to operate 3. Seeking assistance of locally operating NGOs. | Especially in the Shymkent, Aktas, Akzhar, Rabat, Mambetov | Continual activity, as required by records of incidences | SES, Traffic Police | SES | SES own budget |

Environmental Management Plan

PART B: Environmental Monitoring

| B.1 PRE-CONSTRUCTION PERIOD | | | | |
|---|---|---|--|---------------------------------|
| Monitoring Aspect | Monitoring Activity / Details / Outputs | Timing | Executing Unit | Reporting Responsibility |
| B.1.1 No provision for translation of IEE and related documents for use by Oblast Inspectors, and for use in Bid documents (at least this EMP) | Confirm that Kazakh/Russian version of IEE and EMP are with the Oblast Inspectors Confirm that bid documents contain environmental clauses tailored to the project conditions as well as a copy of the precautionary measures outlined in this EMP | During Detailed Design Period, at the time of preparing the bid documents | MOTC/ RC | MOTC |
| B.1.2 Failure of designers to include design measures that will prevent later impacts such as: livestock crossing management, poor traffic management and excessive tree removal | Confirm by reviewing design documents and discussion with design team that 1. livestock crossings in Section 3 have been addressed 2. a plan to protect roadside trees as much as possible has been prepared; 3. there is step-by-step protocol for traffic management during construction (as opposed to ad hoc, hap hazard existing system); and 4. an environmentally friendly bridge and culvert replacement guide has been prepared | During Detailed Design Period, at the time of preparing the bid documents | Detailed Design Team under the direction of MOTC/ RC | MOTC |
| B.1.3 Lack of capacity to understand and implement environmental mitigation measures, in particular the compliance monitoring procedure | Collect and review written material and expertise indicating that MOTC has provided instructions for the contractors to use to better use the IEE output Prepare environmental compliance forms together with Contractors and Sub-Contractors to secure acceptance | During Detailed Design Period, at the time of contract awards | Environmental Supervision Engineer MOTC/ RC | MOTC |

| B.2 CONSTRUCTION PERIOD | | | | |
|---|---|---|---|---------------------------------|
| Monitoring Aspect | Monitoring Activity / Details / Outputs | Timing | Executing Unit | Reporting Responsibility |
| B.2.1 Availability of ecological expertise to prepare the SS EMP and to implement all mitigation and monitoring measures with contractor | Confirm ecological expertise is with contractor at start of construction period: check CV and license certificate(s). Discuss with contractors/sub-contractors the management implications of all measures included in EMP. | At time of each contractor appointment | PMU | MOTC |
| B.2.2 Lack of good housekeeping practices at both camp sites and work sites, including solid and sanitary waste management | Using agreed monitoring checklists, confirm that the items as listed in the SS EMP and in the Technical Specifications are fully implemented. | Throughout construction period, monthly | PMU | PMU and MOTC |
| B.2.3 Tree removal program damaging the old trees and shelter belt plantings along roadsides kept to an absolute minimum. | Inspection of cutting plan and confirmation of consultation with CFH, then review and record re-planting/revegetation efforts. | Throughout the construction period, spot checks | PMU Monitor with the CFH of the Oblast and Rayon were cutting is foreseen | PMU and MOTC |
| B.2.4 Side borrow operations leading to erosion, landslide and destruction of landscape | Undertake inspections to determine the type of borrow operations the contractor is applying and ensure that roadside borrowing is not taking place and is always out of the visual field from the road. | Throughout the construction period and monthly | PMU | PMU and MOTC |
| B.2.5 Earthworks - transport and storage; managing of dust, noise | Undertake, as part of the construction inspection, regular confirmation that earthworks are handled in an environmentally acceptable manner and dust control is undertaken at all time, including the use of tarpaulins by trucks hauling fine materials, as well as watering along the haul road sections passing near/thru villages, and that a speed has to be decreased. Haulage through roadside villages and settlements is restricted. | Every day, throughout the construction period | PMU | PMU and MOTC |

| Monitoring Aspect | Monitoring Activity / Details / Outputs | Timing | Executing Unit | Reporting Responsibility |
|--|--|---|----------------|--------------------------|
| B.2.6 Potential bitumen/asphalt and concrete production spills and pollution. | Confirm that sighting specification for both asphalt and concrete plants are according to norms and codes but also that are at least as far away from settlement areas as defined in the mitigation table. Bitumen storage and handling is done without spillage | Throughout construction period and monthly | PMU | PMU and MOTC |
| B.2.7 Management of petroleum products such as fuel, lubricants and bitumen, without spills and contamination being practiced by contractor and all subcontractors. | Using the monitoring checklist the 8 specific spill of Mitigation table will be assessed and reported on. Unannounced (spot) inspections at all work sites, work camps. diesel generators, technical workshops, maintenance yards and fuel storage facilities. Any non-compliance will be rectified immediately | Quarterly inspections, unannounced | PMU Monitor | PMU and MOTC |
| B.2.8 Potential deficiencies of surface drainage at construction areas | The PMU will inspect and verify that adequate consideration and drainage works and protection have been provided. | 4X during the construction period, and 2X during each rainy season | PMU | PMU and MOTC |
| B.2.9 Construction-related air pollution | Using a monitoring checklist confirm that the six mitigate actions defined in A.2.9 of the Mitigation Table are being implemented | Ongoing throughout the project as part of the construction inspection | PMU | PMU and MOTC |

| B.3 OPERATION PERIOD | | | | |
|--|---|--|--|---|
| Monitoring Aspect | Monitoring Activity / Details / Outputs | Timing | Executing Unit | Reporting Responsibility |
| B.3.1 Post construction operational audit, 1-year after road completion | The owner of the road shall organize and undertake a complete environmental audit of the project. This audit is to be undertaken by the Oblast-level DOEP. Findings must be reported within 15 days of completion of the field inspection and actions to repair any non-compliance conditions started within 5 days of notification by the Inspection Department. All actions must be completed within 30 days. | No more than 13 months after the operating period has fully started. | MOTC, and MOEP | MOTC and Oblast-level Department of Env. Inspection Unit. |
| B.3.2 Management of traffic-generated air pollution | As traffic growth is projected to reach 7%/year, a site-specific monitoring at roadside settlements will be required. Parameters to be monitored are in line with the norms and codes of the national environmental legislation. Monitoring Report. | Monitoring 1X/year for two continuous 24 hour period during the non-winter season at t.b.d. sites | MOTC in cooperation with KAZHYDRO-MET or other approved agency | MOTC |
| B.3.3 Management of traffic-generated noise | Noise impacts are expected to marginally affect human settlements due to the remoteness. Near or at settlements (bypasses) noise levels need to be tested to confirm or modify the measures taken. Parameters to be monitored are in line with the norms and codes of the national environmental legislation. Monitoring Report. | Monitoring will take place 1X/year during peak traffic periods over two 24 hour monitoring periods at t.b.d. sites | MOTC in cooperation with Ministry of Health's Sanitary and Epidemiological Service | MOTC |
| B.3.4 Risk of road accidents with pedestrians and domestic animals due to improved roads, faster speeds and greater traffic volume. | Report on the effectiveness of proposed measures for pedestrian and animal crossing structures, and make further recommendations to improve road safety with respect to these aspects. Modify, as applicable, speed limit signage, pedestrian use zones, and provide more cross walk lighting. Reconsider, as necessary, strengthening and extension of animal fences along road. Accident Monitoring Report. | Undertake annual safety check and review statistics of pedestrian-vehicle accidents and address areas where problems occur | MOTC working with Oblast and Rayon level authorities | MOTC |

| Monitoring Aspect | Monitoring Activity / Details / Outputs | Timing | Executing Unit | Reporting Responsibility |
|---|--|-----------------------------|--|--------------------------|
| B.3.5 Risk of hazardous materials spills due to increased traffic volume | Elaboration of a contingency plan in case of major emergencies, and plan responsibilities for different scenarios. | after one year of operation | MOTC working with Oblast and Rayon level authorities | MOTC |

Abbreviations used in the EMP:

| | |
|----------|---|
| SS EMP- | Site-specific Environmental Management Plan |
| CFH - | Committee for Forestry and Hunting, under the Ministry of Agriculture |
| GoK - | Government of Kazakhstan |
| MOEP - | Ministry of Environmental Protection |
| MOTC - | Ministry of Transport and Communication |
| PMU - | Projects Management Unit, Team of consultants working closely with the Implementing Agency, the South-Kazakhstan region Road Committee (RC) |
| RC - | (South-Kazakhstan) Road Committee, under the MOTC |
| RE - | Resident Engineer |
| SES - | Sanitary and Epidemiological Services, under the Ministry of Health |
| t.b.d. - | to be determined |