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REPUBLIC OF KAZAKHSTAN
MINISTRY OF INVESTMENT AND DEVELOPMENT
COMMITTEE FOR ROADS

CENTER SOUTH ROAD CORRIDOR PROJECT:
KARAGANDA – BALKHASH – BURYLBAITAL

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

FINANCED BY INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AND REPUBLIC OF KAZAKHSTAN

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Prepared for:

Committee for Roads
Ministry of Investment and Development
Republic of Kazakhstan
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ABBREVIATIONS

Akimat	Local executive body in Kazakhstan
CfR	Committee for Roads,
DE	Design Engineer
ESF	Environment and Social Field
EMF	Environmental Management Framework
EMP	Environmental Management Plan
ESIA	Environmental and Social Impact Assessment
FS	Feasibility Study
H&S	HealthandSafety
HGV	Heavy Goods Vehicle
ME	Ministry of Energy of the Republic of Kazakhstan
CfEACSIiOG	Committee for Environmental Adjustment, Control and State Inspection in Oil and Gaz Sector
MID	Ministry of Investment and Development of the Republic of Kazakhstan
IBRD	International Bank for Reconstruction and Development
PAP	Project-Affected Persons
HCH	Historical and Cultural Heritage
PMC	Project Management Consultant
CSC	Construction Supervision Consultant
MP	Monitoring Plan
RK	Republic of Kazakhstan
RPF	Resettlement Policy Framework
SEE	State Environmental Expertise
SoW	Scope of Work
WB	World Bank

EXECUTIVE SUMMARY

Background

The Committee for Roads of the Ministry of Investment and Development (MID) of Kazakhstan is implementing the Centre South Road Corridor Project: Karaganda – Balkhash - Burybaital road sections passing across the territory of Karaganda and Zhambul oblasts. The Project involves the rehabilitation and widening of the existing road from 2-lane to 4-lane of approximately 660 km within the existing road section of the above-specified Corridor, which passes through the various environments and landscapes. The Project has all the physical characteristics of a large linear infrastructure project, with significant spatial extension, visible impact on landscape, biosphere and land use patterns, and significant impacts on topography, climate, natural conditions and human activities. The road alignment crosses almost similar land forms, land use types, and micro-climatic zones. The project has been structured and divided into fourteen (14) sections with total length of approximately 660 km. The map of the alignment is presented in Appendix 1.

This Executive Summary (ES) describes the project and summarizes key findings of the ESIA.

Project Description

The proposed Centre South Road Corridor is very important for the development of the north and south of Kazakhstan for both industrial and tourism development aspects in this area. This corridor is one of the priority objectives of the Government of Kazakhstan in the Transport Sector. Accordingly, the Government of Republic of Kazakhstan is conducting a program to upgrade the major roads of the country that are managed by the Committee for Roads of the Ministry of Investment and Development. The program aims to improve transportation and transit of goods in and around the country and to the surrounding countries with a significant growing contributor to GDP.
The project involves the rehabilitation and widening of approximately 660 km of the existing road from a single (2-lane) carriageway road to 4-lane Category 1B road. This road corridor section will connect the cities of Astana, Karaganda, Balkhash and Almaty. The project will start at km 1497 of the existing road near Karaganda and will end at km 2152 in Burylbaital village.

Scope and Methodology of the Environmental and Social Impact Assessment (ESIA)

The ESIA has been prepared by "KAZDORNII" JSC in association with "KazCEP" LLP as a part of the consultancy services for the proposed Centre South Road Corridor section in accordance with the Kazakhstani National Requirements (Environmental Code of RK, 2007 and other instructions and norms), as well as the World Bank Operational Policies OP 4.01 and OP 4.12. ESIA includes Environmental Management Framework (EMF) and Monitoring Plan. The representatives of PMC "KazdorNII" JCS and "KazCEP" LLP have undertaken site visits to the project area during the period from May 26 to June 26, 2015 in order to study the proposed road alignment and environmental aspects of the propoesed project.

The purpose of the ESIA is to define the baseline environmental conditions in order to identify and assess the impacts of the various activities of the proposed project. This project is currently at the stage of feasibility study and detailed design. It has not been subject to site-specific EIA yet. The ESIA contains Environmental and Social Management Framework in the form of ge-

neric EMP and Environmental Monitoring Plan which should be followed during the detailed design and preparation of site-specific Environmental Impact Assessments and Environmental Management Plans (EMPs).

The ESIA methodology includes the analysis of available baseline data (annual reports on state of environment, social-economic analysis of project region, geospatial data, expert interviews), overview of applicable environmental legislation analysis of alternatives, and discussion of mitigation measures to avoid and minimize potential negative impacts. It includes monitoring plan to assess whether mitigation is properly implemented and results in anticipated positive effects. Also, during the preparation of the ESIA consultations were held with experts from the Ministry of Transport of Investment and Development, relevant Regional Administrations, Regional Departments of Environment, Water, etc. of the Republic of Kazakhstan. Potential environmental impacts have been assessed according to the World Bank policy and the Kazakh environmental legislation. In addition, institutional aspects have been taken into consideration.

Project Components

Component 1 – Transport Infrastructure *(Total US$2,443.2 million; IBRD US$2,150 million)*

This component will finance reconstruction of 787 km of road. It includes improvements of the existing two-lane road from Karaganda to Burylbaital (660 km) to a dual carriageway four-lane road with asphalt wearing course. Apart from minor deviations to improve geometry or bypass villages/towns, the improved road will largely follow the existing alignment. Bus-shelters, pedestrian crossings, interchanges, bridge and drainage structures, and road safety furniture, will also be included. Component 1 will also finance consulting services for engineering supervision of civil works. Land acquisition and road design costs will be financed separately through the Republican budget. Financing is also included to construct road-side service facilities, and for tolling and Intelligent Transport Systems (ITS), but financing to develop the technical specifications and concept designs will be provided under Components 2 and 3.

The ESIA addresses potential environmental and social risks associated with Component 1 only, given that activities under Components 2, 3 and 4 will not result in either direct or indirect impacts.

Component 2 – Jobs and Skills Initiatives *(Total US$13 million; IBRD US$11.4 million)*

This component is designed to stimulate private sector development along the project corridor. Outside of the urban areas of Karaganda and Balkash, the population is sparse, and jobs are likely to evolve from (a) services provided to users transiting the corridor through the development of Road-side Service Facilities; (b) activities and interventions that will strengthen the existing commercial activities and market chains; and (c) vocational, entrepreneurial and life-skills training that will develop the social capital of the existing resident population and improve the competency and employability of the road-workers[1].

Component 3 – Road Safety and Sustainability *(Total US$18.3 million; IBRD US$16.1 million)*

[1] Direct employment created by road construction is significant. Based on SWRP and EWRP, about 1 job-month is generated for every US$8,300 of road expenditure. Extrapolating to CSRCP,240,000 job-months may be generated

This component will identify and prioritize actions to improve road safety, through various types of audits and information databases.

Component 4: Project Management and Impact Assessment *(Total US$8.5 million; IBRD-Nil)*

Under this component **counterpart financing only** will be used to (a) support project management functions including interagency coordination, technical inputs and supervision of safeguards and fiduciary aspects; (b) collect data for result and impact evaluation; and (c) provide completion review assessments, including lessons-learnt studies and impact assessments.

World Bank Safeguards Requirements

System of environmental categorization of the World Bank's Projects determine according to the probability and risk magnitude related with project implementation (subprojects).Taking into account spatial scale of the project and its potential adverse impact, project was classifies as Project of Category A according to the World Bank Safeguards. This classification justifies of the large scale works such as widening of the 2 lane road up to the 4 - lane road on exciting road, as well as other engineering structures.

Environmental Assessment OP/BP 4.01 (triggered): The main envisaged potential negative impacts during construction are the development of borrow pits, generation of waste (construction materials, spent consumables, household waste and wastewater from camps), excessive land use, topsoil destruction and erosion. There is also a potential impact on groundwater and surface water from excessive turbidity and siltation, washing equipment in rivers (e.g. cement trucks) and accidental spills involving fuels and lubricants. During operation of the road storm drainage management, soils, ground and surface water contamination by heavy metals, soot and organic compounds (e.g. PAH), noise, dust, air pollution will be the main issues. Moreover, there is a potential risk of destruction or disruption of natural habitats and ecosystems by poor construction management.

Currently, the Committee for Roads (MID) is preparing ESIA report for each design section (i.e. a total of 14 section reports).ESIA reports will contain project description, baseline data, impact analysis and mitigation measures. Environmental Management Plan (EMP) that is typical for each road section will be developed upon the design works completion for all works sections and integrated into bidding and contract documents to provide clear guidance and contractual obligations for proper environmental supervision in further project implementation.

Natural Habitats OP/BP 4.04 (not triggered): The project road of reconstructed corridor of "Karaganda – Balkhash – Burybaital" of the Centre South Road Corridor Project goes through Karaganda and Zhambyl oblasts along Balkhash Lake. The territory consists of three zones such as arid steppe, semi-dry semi-desert and dry northern desert, which sequentially replaces each other from north to south. A small section of road in Moyynkum District of Zhambyl Oblast runs through the site with regulated regime of Zhusandalinskaya State Conservation Area of the National Significance (GZZRZ). Although the regulated-regime area formally is a part of Zhusandalinskaya State Conservation Area, there are no strictly protected areas/sections and no habitants of animals listed in the Red Book of Kazakhstan along the alignment. Given the fact that the alignment runs along the road, which existed for a long time, the project's impact on flora and fauna will be insignificant. It should be also noted that birds and mammals are generally found far away from the existing alignment and it is not expected that the Project will affect its habitats. No regular or seasonal strong movement of animals is observed in this area. At the

same time, bridges over the rivers, culverts and cattle and agricultural underpasses will serve as a potential routs for random movement of animals in the area of the alignment.

Forests OP/BP 4.36 (not triggered, but addressed in ESIA):
There are no forests within the area of project influence and this OP/BP is not triggered. Low-value trees/bushes at the roadside, which need to be cut due to project activities, will be replaced under the measures prescribed by the EMP (environmental management plan). This will be undertaken by a separate landscaping contract.

Physical Cultural Resources OP/BP 4.11 (triggered): This OP/BP is triggered during this assessment since PCR (physical cultural resources) objects have been found in the construction area, which, in accordance with applicable laws of Kazakhstan, are located within the protected zone 200 meters from the road and might directly be affected by the project. The Action Plan for the Research and Preservation of Archaeological Sites was prepared by the Client. Activities under this Action Plan will be performed at the territory of three historic sites: (1) architectural site Burmetam Mazar (end XIX – early XX century), (2) set/complex of five kurgans - burial mounds – called Batystau (archaeological monument), and (3) one stand-alone kurgan - Zhalgyz Oba (both 2 and 3 are archaeological monuments). All these sites are located within the area of construction/widening of the road. According to historic research, these kurgans belong to different historic times, including the era of Iron Age and contain materials that are valuable for the ancient history and culture of ancient times and the objects associated with the funeral cult and rituals of the Republic of Kazakhstan.

Also, after the completion of the detailed design and during the construction period it is possible that additional PCR objects and chance finds can be detected. “Chance finds” procedure is contained in the Archaeological report (Appendix 2 to the ESIA). In case other PCR are identified, a detailed PCR Management Plan/s will be prepared during preparation of detailed design.

Involuntary Resettlement (OP/BP 4.12, triggered):
This policy covers the direct economic and social impacts that are caused by the involuntary land acquisition resulting in (i) relocation or loss of shelter; (ii) loss of assets or access to assets; or (iii) loss of income sources or means of livelihood, whether or not the affected persons must move to another location; or the involuntary restriction of access to legally designated parks and protected areas resulting in adverse social impacts. If a project requires either land acquisition or resettlement (as defined above), it is necessary to develop either a shortened or full Resettlement Action Plan (RAP), depending on the scale of the impact (significant or non-significant).

Social Management Framework and Resettlement Policy Framework (RPF) are stand-alone-documents prepared by “KazdorNII” JSC and approved by the Committee for Roads (MID).Site specific RAP will be prepared upon completion of the detailed design of the road section according to the completed list of affected properties, businesses and the people, who are affected under the impacts of this road section construction.

BP 4.37 on the Safety of Dams (not triggered):
No dam safety issues were found during assessment of the project area.

Projects on International Waters OP/BP 7.50 (not triggered): There are no international waterways in the project area. There will be no impact on the hydrological regime of rivers crossed by bridges, as its hydrological flow pattern will remain entirely unchanged.

ESIA includes Environmental Management Framework (a plan to reduce adverse impacts, Section 7) and Environmental Monitoring Plan (Section 9).

Environment and Social Baseline Conditions

The project corridor runs throughout the Kazakh Uplands area and along left side of Balkhash Lake. It thus will be confined to the alluvial plains of the foreland, which have soft morphology; geology is characterized by thick accumulations of proglacial, aeolian and fluvial sediments, and surface water network that drains to the North and flows further into Balkhash Lake. There is relatively much of groundwater in the project area, ranging in depth from shallow aquifers in young sediments to deep thermal waters.

The Climate varies from moderate in the West, to arid in the East, with clear continental character, cold winters and hot, dry summers, precipitation occurring in relatively short periods in spring and fall. Natural hazards do not pose a key risk in the project area. The main hazard results from rivers traversed by the road, many of which have their catchment areas in the mountains and thus show high seasonal variability with a significant potential for flash floods during heavy showers. Erosion or rock falls, landslides and mudflows are not seen as significant potential risk for the road.

Most of the settlements located along the road corridor are involved in traditional human activity for this area, such as cattle-breeding and farming. There is irrigated agriculture along the road section from Balkhash town to Burylbaital village. The entire project corridor shows anthropogenic impact mainly in forms of animal husbandry and agriculture. There will be no conversion of pristine, untouched habitats under the project. However, settlements that are located close to the road alignment may require installation of noise protection measures/screens.

Impacts Mitigation and Environmental Management

The design of the road sections includes measures for the minimization of environmental impacts. The route follows mainly the existing alignment (in the form of asphalt road) and thus it is limiting the conversion of land to other land use types. Noise protection and measures on road safety (speed limit, provision of pedestrian crossings and passages) will be included. The design will also take into account requirements stipulated by farmers, who are living along the alignment, in terms of safe cattle passes and safe passes for agricultural machinery. Those cattle passes will also serve as wildlife passes. The design will take into account the results from hydrographic and hydrological studies, it will be designed sufficient numbers of culverts to avoid damming of permanent or seasonal watercourses and creation waterlogged areas. The design of bridges will take into account the seasonality of discharges, as well as the likelihood of flash floods.

Most impacts during the construction period (noise, dust, exhaust fumes and water discharges from the camps and roads) will be mitigated by the standard prevention and minimization impacts methods. Surface watercourses will be protected by settling ponds and by filters if it is necessary (e.g. straw bales). Wastewater from construction camps as well as septic sludge will be transferred to existing wastewater treatment plants. Groundwater impacts not expected, as no deep excavations or major cuts planned. Water for camps will be collected in relatively small amounts from existing wells or central water supply.

Inconveniences to the public will be minimized by limiting work hours and not allowing nighttime works. In cases when works are carried out in close vicinity to residential areas, additional measures, such as noise barriers will be provided.

Borrow pits will be operated by the Contractors only at locations that will be pre-identified prior to project implementation and for which both operational and environmental permits will be obtained. No borrow pit will be operated without a site specific EMP, typical for the section, that will contain a plan for its closure, remediation and re-cultivation that will be approved by the environmental authorities (as required under Kazakhstanilegislation) as well as with construction supervision consultant (who will ensure that international good practice is followed).

All environmental management measures to be carried out by the Contractors during the construction period will be integrated in the tender documents and become a part of the contractual works. This will also include a manual on random finds procedures to be followed in case of random discovery of potential PCR. The Contractors will be required to have permanent staff on site with the specific responsibility of environmental and social aspects, (including grievance redress expert), who will be accountable to the construction supervision consultant.

During construction, the water for technical needs will be taken from Balkhash Lake and nearby located rivers. The capacity of these sources is sufficient and water resources potential will not be exhausted during the construction period. Pool of Balkhash Lake is sufficient enough as and required to provide the required water for the rehabilitation and reconstruction of the road corridor section.

Drinking water will be supplied by the Contractors from the existing wells of general water supply system. Within the area of the road section there are sufficient ground water sources.

During operation, of the described above, noise reduction measures from cars and traffic safety measures will be properly monitored and maintained. Any required modifications, upgrades or additions will be flagged and integrated into the road repair and maintenance plan

Analysis of Alternatives

The project works on the alignment will follow the existing road, in order to avoid any additional impact on the landscape, except for the areas of bypasses and road geometric improvement in some places. Existing basic cable communication lines and power lines, along the alignment will be relocated in the same corridor along the road section. Bypasses of the following settlements will be built: Karaganda, villages of Kurma, Zhumabek, Aksu, Aksu-Ayuly, Saryshagan, and Balkhash town. Traffic separation in the village of Akshatau (near service facilities) will be arranged. Accordingly, the alternatives are considered only for the areas where bypasses of the indicated settlements will be constructed. Also, "without project" and "with project" alternatives were considered.

Cumulative Impacts

In future, the improved access will have broader economic/social development implications particularly of new or significantly improved roads. These future developments are not considered to be associated with this project in the sense of needing to apply the safeguard policies to them. This is because there are no specific developments that can be expected as a result of the project.

Land acquisition and Resettlement

The proposed Project entails land acquisition and associated impacts, as is to be expected in a highway project for the potential bypasses alignments. In the detailed Project design there will be prepared Land Acquisition and Alienation Management Plan for road construction in accordance with the requirements of the Bank, as well as the following aspects should be agreed with Committee for Roads (CfR).

Principles and standards incorporated into the Resettlement Policy Framework agreed between the CfR and the Bank for use throughout the Centre South Road Corridor Project implementation are applicable to the proposed project;

(a) Actual implementation of the Resettlement Policy Framework (RPF) has been conducted to assess the land acquisition, as well as to propose supplemental measures as necessary to fully meet the RPF requirements at this stage.

(b) Arrangements for continued monitoring and reporting on the individual cases of land acquisition that will be initiated but not yet started by the time of the project appraisal.

According to preliminary assessment, the projected road will go along the existing road without any major changes in alignment of the road other than the proposed by-passes, thus number of people who will be affected by the project in connection to the existing road rehabilitation and reconstruction will be minimal. According to the preliminary assessment of bypasses, only few people and properties will be affected by the project. It has been found that within the road reserve no other properties will be affected. However, additional land acquisition may be required to accommodate the proposed dualing of the road for the construction of the road in some isolated areas. All the details of properties and land affected by the proposed dualing will be found by detailed design and project documentation.

Reconstruction of the road will require temporary land use for the entire period of construction to accommodate concentrated off-the-way borrows soil, construction camps, parking areas for road-building equipment and road-building materials warehousing sites.

Along with it, all lands required for temporary use or access will be obtained on a voluntary basis, negotiated directly between landowners and contractors, who will work and use the lands during construction, the agreements on the compensation payment for temporary land use will be concluded.

The Resettlement Policy Framework project provides all the details in relation to various types of the required land acquisition.

Upon finalization of the detailed design, the Resettlement Action Plan (RAP) for the Centre South Road Corridor Project will be prepared in accordance with the Kazakhstani legislation as well as the requirements of the World Bank OP 4.12: Involuntary Resettlement.

The RAP will specify the procedures to be followed by the Government of Kazakhstan through the Committee for Roads (CfR) and the Ministry of Investment and Development (MID), as well as actions that will be takenfor proper resettlement and compensation payment tothe Affected Persons. The document provides description of the land, households and businesses that will be affected by property acquisition. The RAP's objective is to mitigate the negative impacts of land acquisition and displacement, as well as to set out the entitlements of different categories of affected persons, paying particular attention to the most vulnerable ones.

The RAP will be applied to all affected persons regardless whether or not they have legally registered title to the land. The severity of the impact will however affect the nature of the compensation and other assistance provided. The RAP document will be the result of various phases of public hearings, data collection and analyses.

The RAP's requirements are binding to both the Government of Kazakhstan through the Committee for Roads and the Contractors involved in the Project implementation.

Public Hearings and Information Disclosure

"KazdorNII" JSC and "KazCEP" LLP held public hearings on June 05-06, 2015 in Aksu-Ayuly, Akshatau, Saryshagan villages and on June 17-18 in Balkhash town, Gulshat, Kurminka, Kashkanteniz, Shyganak villages. The held public hearings provided the local residents and the parties involved in the project with an opportunity to review and discuss the issues of concern related to environmental and social aspects, express their demands and recommendations that should be included in the ESIA and RAP. The preliminary public hearings were held successfully. Additional Public hearings/ consultations were held on November 04-05, 2015 in villages Aksu-Ayuly, Saryshagan, Shuganak, and town of Balkhash. The issues discussed include the ESIA design and environmental protection activities, locations of border crossings and cattle passes (very important for socio aspects), location of batching plants, construction camps, parking lots for construction machinery etc.) and sources of water supply.

The draft ESIA was disclosed in the Infoshop (in English) and locally (in Russian) by the Client on May 6, 2016. The second round of public consultations was organized on the draft ESIA during May-June 2016 for local communities along the alignment. The finalized ESIA was disclosed locally and in the Infoshop.

More informal consultation will be done during implementation through:

- The preparation and dissemination of a brochure in Kazakh and Russian, explaining the project, works required and anticipated timing of the works; and
- Setting up a formal grievance redress committee with a representation from the local community. The Project supervision Consultant in association with the contractor and CR will be responsible for managing the effective grievance redress program.

Local Population and Social and Economic Situation

For all settlements situated along the proposed road corridor section, impacts have been evaluated for land use, road infrastructure, water supply network, power and gas supply, health, education, culture and sport facilities, as well as industry and business.

During site visits and meetings with local residents, no impact on minority groups has been mentioned.

The principal negative impacts are:

- The proposed road can be a potential obstacle for farmer's machinery and cattle movements,
- In some locations, the proposed road can be a potential obstacle for reaching schools, stores and other local facilities,

- During construction, water, electricity and gas supplies to the inhabitants and farms might be affected by the project,
- During construction drainage and irrigation system, the fields can be affected potentially,
- Influx of workers,
- Land acquisition and involuntary resettlement may cause adverse impacts on Project Affected Persons (PAPs), particularly if the process is not managed properly,
- During the construction, some restrictions to land use of PAPs might occur,
- Land acquisition and construction of the road may negatively impact on the livelihoods of PAPs in terms of agricultural production

The principal positive impacts are:

- The new road will provide a better connection with the rest of the districts, the regions and the country.
- The widened dual carriageway will revive local economy, as it will facilitate to the construction of new stores, restaurants, bars, petrol stations, local grocery stores.

Environmental and Social Management Framework (ESMF)

The Environmental and Social Management Framework (ESMF) in this ESIA document is presented in the form of generic EMP and has been prepared as part of the EISA study in order to define the environmental measures and procedures that will need to be adopted by the construction company for the contractors and other parties responsible for project implementation. It will provide the guidance for preparation of site-specific Environmental Management Plans (EMPs). The ESMF may need to be revised during the course of the project implementation.

The ESMF is designed to contain the following information:

- potential environmental and social impacts
- mitigation measures;
- institutional roles for implementation of mitigation measures during construction and operation of the road;
- monitoring plan.

The site-specific EMPs will define the timing, frequency, duration and cost of mitigation measures in the form of implementation schedule, and these actions will be integrated into the overall project work plan.

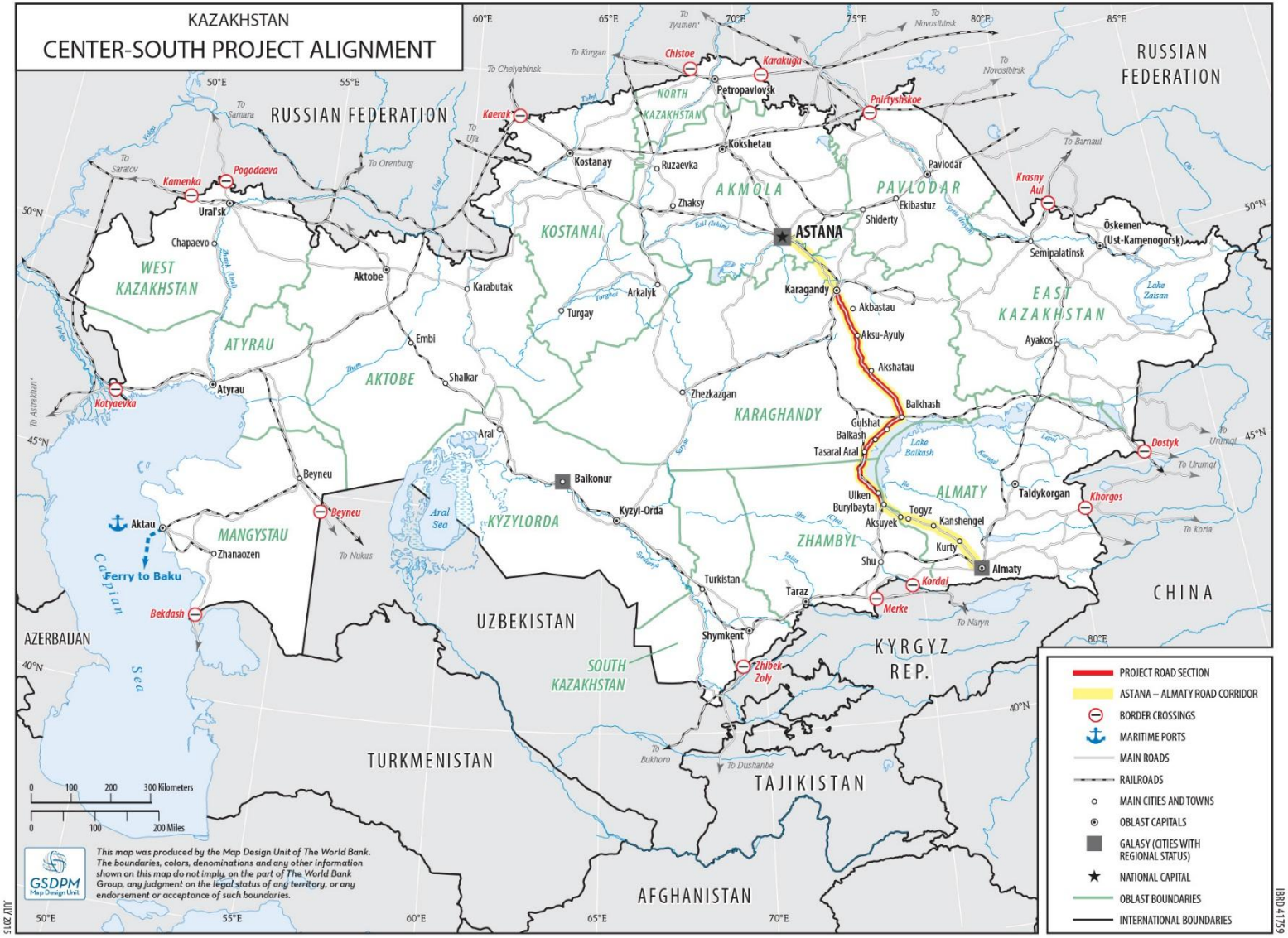
Monitoring Plan will set out the ways in which the monitoring of the environmental impacts and the implementation of the mitigation measures during the construction phase will be carried out. The monitoring will be focused on the limited number of impacts identified during the ESIA to ensure the efficiency of the planned mitigation measures.

Findings, Recommendations and Conclusions

The proposed road widening project will have moderate environmental and social impacts. With appropriate mitigation measures during the project construction phase, the impacts referred to in this report will be acceptable in environmental and social aspects. The improvement and widening of Karaganda – Balkhash – Burybaital road section of the Center South Road Project will

bring social and economic benefits to the communities living along the alignment. A fast, safe and all-weather road will allow efficient and rapid transportation of goods between China, Kazakhstan, Russia, as well as Europe and Central Asia. Goods produced in these countries will be quickly delivered. Agricultural products from the area, where it is the major occupation, and other local products will be rapidly transported to wider markets. Workforce will be also freely moved between the countries; tourism that is more significant for regional and international economy will also develop. On a regional level, populations of Karaganda, And Zhambul oblasts will benefit more from faster travel times to other cities and regions located in the center and south of Kazakhstan.

Appendix 1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CENTER-SOUTH PROJECT ALIGNMENT
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NORTH KAZAKHSTAN
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Merke
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Karakuga
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Kaerak
Kamenka
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Krasny Aul
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PROJECT ROAD SECTION
ASTANA – ALMATY ROAD CORRIDOR
BORDER CROSSINGS
MARITIME PORTS
MAIN ROADS
RAILROADS
MAIN CITIES AND TOWNS
OBLAST CAPITALS
GALASY (CITIES WITH REGIONAL STATUS)
NATIONAL CAPITAL
OBLAST BOUNDARIES
INTERNATIONAL BOUNDARIES
IBRD 41759

1 INTRODUCTION

The total length of Karaganda-Balkhash-Burylbaital road section of the Center-South Road Corridor Project is about 660 km. Partial reconstruction and widening of the existing road within the existing right of way is planned within the project implementation. The project passes through a variety of land forms, land-use types and (micro) climatic zones.

The Government of Kazakhstan has now requested that the World Bank provides funding for development of the Centre South Road Corridor Project through road rehabilitation and widening from 2-lane to 4-lane road on the existing alignment connecting Astana and Almaty in order to achieve the following:

- Lower vehicle operating costs;
- Lower travel times;
- Greater access to markets and job opportunities;
- Higher economic opportunities; etc.

In accordance with the requirements of the Government of Kazakhstan, the Environmental Impact Assessment (EIA) reports have been prepared. These EIA reports development was conducted in accordance with the provisions of the Environmental Code of the Republic of Kazakhstan and other applicable legal and regulatory guidance documents of the RK that are regulating environmental protection and safety issues. The content and composition of the EIA materials meets the requirements of "Guidelines for the Assessment of Proposed Economic and Other Activities on the Environment in Development of Pre-planned, Planned, Pre-design and Design Documentation approved by the Decree of the Minister of Environment of the Republic of Kazakhstan dated June 28, 2007 № 204-p".

In accordance with the World Bank requirements and operational procedures, this Road Corridor section has been defined as a Category A project, and the EIA report is necessary to be prepared in accordance with the World Bank Operational Procedures of "Environmental Impact Assessment" OP 4.01. Accordingly, the ESIA report structure has been prepared as suggested by the World Bank's operational policies and related guidelines. This work has been carried out by the Environmental Team experts from "KazdorNII" BJSC (Astana) together with the Appointed Sub-Consultant of "KazCEP" LLP in accordance with the Terms of Reference agreed with the Committee for Roads.

This ESIA report covers all the 14 road sections.

The ESIA purpose is to identify the environmental and social impacts of the proposed road development. The report includes the following main sections:

- Project Description
- Analysis of Alternatives
- Environmental and Social Baseline Data
- Environmental and Social Impacts Assessment
- Impacts Mitigation Measures
- Monitoring Plan
- Institutional Obligations

- Information Disclosure, Consultation and Public Hearings. Parties Involvement and Mechanism

2 PROJECT DESCRIPTION

2.1 General Project Information

"Center-South" Road Corridor Project is a large road segment with high level of traffic which connects Almaty and Astana. Karaganda-Balkhash-Burylbaytal road section from 1444 km to 2152 km, as well as Kurty-Kapshagay Road Section from 0 km to 67 km with the total length of approximately, 660 km, which forms the part of the Center-South Corridor.

Karaganda-Balkhash-Burylbaytal road section is located in Karaganda and Zhambyl Oblasts respectively. The above road section will provide an essential link in the route between Western China and Western Europe. This route objective is to provide all-weather divided highway through the western China, Kazakhstan and Russia. This route will have significant economic benefits and will greatly improve flow of goods, tourists to improve social contact between China and Kazakhstan.

The existing road is Category II road which was constructed in late 2006, and now, it is planned to reconstruct the road section to Road Category Ib.

The proposed road alignment will be partially rehabilitated in the existing road within the existing right of way (70 m) almost parallel to the existing road. The design road crosses a variety of landscapes, land use types and (micro) climatic areas. The road alignment lies across Karaganda and Zhambyl oblasts.

The project road corridor section has been structured into fourteen design sections in Karaganda, And Zhambul oblasts with varied length from 40 km to 64 km as shown in the Table 2.1.1.The detailed design are now under development and expected to be completed all the sections in late 2016.

Table 2.1.1 Centre South Road Corridor: Karaganda – Balkhash – Burybaital Section are divided into 14 Sections/Lots

№ of section	Name of Section/Lot	Length from and to, Km	Length of Each Section, km	Expected Date of Completion of Design	Road Section under Region/Oblast
1	"Karaganda (Zarachnyy)-Akbastau"	1497-1537	44.6	October, 2016	Karaganda
2	"Akbastau - Aksu"	1537-1578	41	October, 2016	
3	"Aksu-Aksu Ayuly"	1578-1620	42	March/April 2016	
4	" Aksu Ayuly -Batystau"	1620-1666	46	July 2016	
5	" Batystau -Akchatau"	1666-1713	47	October 2016	
6	" Akchatau -Akzhal"	1713-1760	47	October 2016	
7	"Akzhal – Bektau Ata"	1760-1807	47	July 2016	

8	"Bektau Ata -Balkhash"	1807-1855	48	September 2016	
9	"Balkhash -Gulshat"	1855-1905	50	September 2016	
10	" Gulshat -Tasaral"	1905-1955	50	September 2016	
11	" Tasaral -Saryshagan"	1955-2005	50	November 2016	Zhambyl
12	" Saryshagan -Mynaral"	2005-2069	64	July 2016	
13	" Mynaral -Ulken"	2069-2105	36	September 2016	
14	" Ulken -Burylbaital"	2105-2152	47	March/April 2016	
	Total:		**660**		

The lengths of the road sections and oblasts through which it will pass are presented below:

- Karaganda Oblast: Length of the road section is 513 km and passes through the road section that begins at 1497 km near Karaganda and then runs through Abay, Bukhar-Zhyrau, Shet and Aktogay Districts.
- Zhambyl Oblast: Length of the road section is147km (from 2, 005 km to 2, 052 km of M3 road) and passes through Kashkan Teniz village (1 km from the road), Mynaral village (7 km from the road), Ulken village (related to Almaty Oblast and passes 9 km from the road), Shyganak village (1 km from the road), Burybaital village (0,5 km from the road) in Moiynkum District.

This project is large and significant enough and will have environmental and social impacts, as well as will require land acquisition fora number of plots along the existing route and for by-passes. All these land plots that are subjected to acquisition will be identified upon completion of the detailed design. These impacts are site-specific; e.g. few impacts such as land acquisition for a new road section and bypasses, are irreversible but in most cases mitigation measures will be developed.

2.2 Project Characteristics

The existing road key technical characteristics

- road category – II;
- number of traffic lane – 2
- width of traffic lane – 3.75m;
- roadway width – 7.5 m;
- roadbed width – 15m;
- maximum estimated width of right of way – 40 m;
- maximum estimated speed – 80 - 100 km/h;
- average estimated speed – 60 km/h;
- type of pavement – bituminous
- bridges and culverts – required replacement and reconstruction

Key technical characteristics of the projected road are as follows:

- road category – 1b;
- length – 660 km;
- roadbed width – 25,5 m;
- number of traffic lanes – 4;
- width of traffic lane – 3.75m
- width of median – 3m;
- maximum estimated width of right of way – 70 m;
- maximum estimated speed – 120 km/h;
- average estimated speed – 80 km/h;
- bridges and overpasses – will be determined upon the completion of detailed design for each road section
- culverts – will be determined upon the completion of detailed design for each road section
- rest areas – will be determined upon the completion of detailed design for each road section
- type of pavement and type of coverage – asphalt-concrete.

Estimated construction period: 3 years (36 months).

Construction works include the following:

- Site clearance and preparation;
- Borrow pits installation and operation;
- Construction of workers' camps, warehouses and workshops;
- Roadbed construction;
- Road surface construction;
- Road pavement construction;
- Construction of junctions and crossings;
- Construction of multi-level interchanges;
- Construction of bridges and overpasses;
- Installation of traffic signs and fences;
- Application of road marking;
- Construction of drainage channels for the roadway and bridges;
- Construction of training dikes near artificial structures

Typical road cross-section for the proposed widening in cases if the road passes through the flat terrain, undulating and hilly sections are shown below.

Figure 2.2.1 (a): Typical Road Cross-Section for the proposed rehabilitation and widening of the existing road.

Typical section of the proposed road passes through the flat terrain

The topography of the area is flat with natural incline.

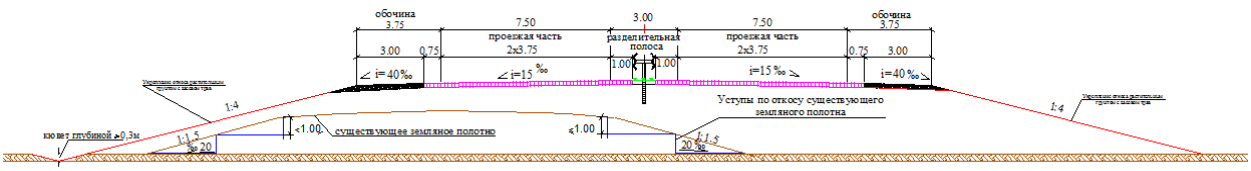
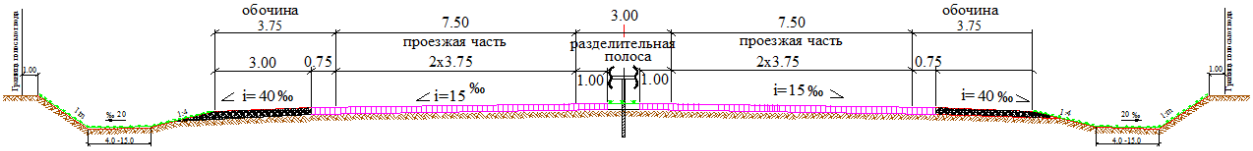


Figure 2.2.1 (b): Typical Road Cross-Section for the proposed rehabilitation and widening of the existing road.

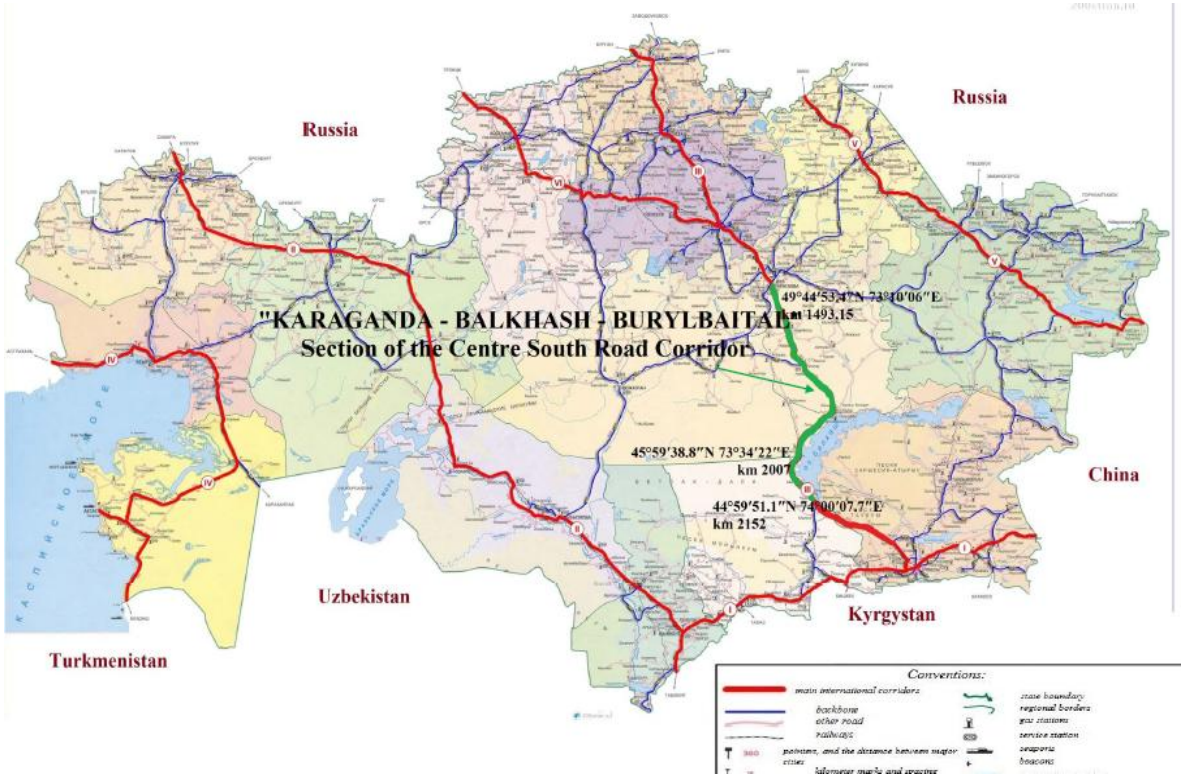
Typical road section passes through hilly and twisting areas



2.3 Road Sections

Karaganda-Balkash-Burybaital road section of the Center South Road Corridor project location is shown in the road network map of Kazakhstan in the Figure 2.3

Figure 2.3 Karaganda-Balkash-Burybaital road section of the Center South Road Corridor



2.3.1 Road Section in Karaganda Oblast[2]

[2]Karaganda Oblast is located in the central part of Kazakhstan. It extends for 600 km from north to south and for 1100 km from east to west. The area of the territory is 402.4 thousand km2. In the north it borders with Kostanay, Akmola and Pavlodar oblasts, on the east - with East Kazakhstan, on the south - with Almaty, Zhambyl, South Kazakhstan and Kyzylorda oblasts, and on the west - with Aktobe Oblast. The total length of Karaganda Oblast borders is about 4 thousand km. Karaganda Oblast has sequentially changed three zones from north to south: arid steppe, semi-dry semi-desert and dry northern desert.

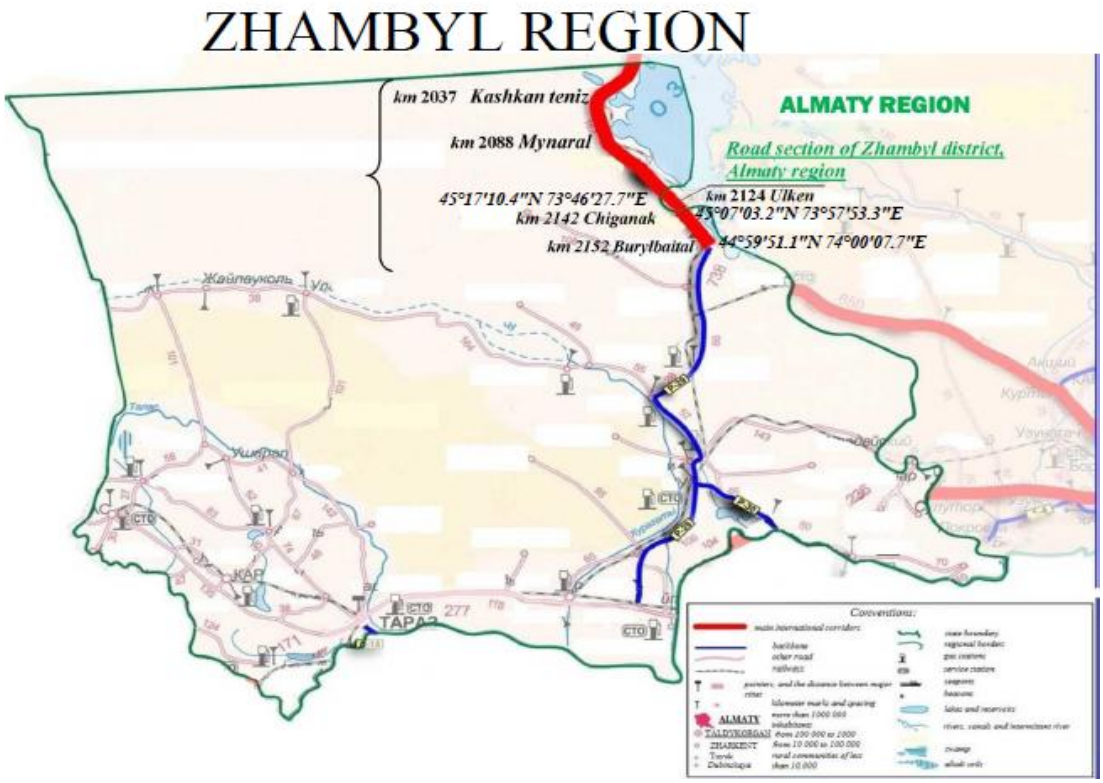
- The total length of the road section in Karaganda Oblast is approximately 513 km and passes through the route section, begins from km 1497 and runs through Abay, Bukhar-Zhyrau, Shet and Aktogay Districts.

Figure 2.3.1: The road section alignment in Karaganda Oblast Map along the existing road from Astana to Almaty.

2.3.2 Road Section in Zhambyl Oblast

The total length of the road section in Zhambyl Oblast is approximately 568 km (2 005 km to 2 052 km of M3 road), and it passes through Kashkan Teniz village (1 km from the road), Mynaral village (7 km from the road), Ulken village (related to Almaty Oblast and located 9 km from the road), Shyganak village (1 km from the road), Burybaital village (0.5 km from the road) in Moiynkum District. Below is the road section that passes through the territory of Zhambyl Oblast.

Figure 2.3.2: Road section alignment in Zhambyl Oblast Map along the existing road from Astana to Almaty.



2.4 Traffic Volumes and Transport Modes

Traffic volume is taken into account as one of many factors in roads classification. Based on the information received from the Committee for Roads of the MID RK, the following traffic volume, specified in the Table 2.4.1., had been recorded in the past 5 years.

Table 2.4.1 Information on traffic along Karaganda-Burybaytal road sections for the period of 2009-2014

Oblast	km	Traffic Volume	Year
Karaganda Oblast	1444 - 2005	4646	2009
		4916	2010
		5023	2011
		7352	2012
		6489	2013
		9916	2014
Zhambyl Oblast	2005-2214	2093	2011
		3059	2012
		3517	2013
		5315	2014

The table above shows that the traffic volume is increasing year after, due to which the road widening is required for further road safety compliance.

The traffic volume in Astana-Almaty road section in the 1st quarter of 2015 is given in the Appendix 6.

2.5 Bridges and Rivers

According to the results of completed draft projects reports on two following sections, 2 bridges construction has been planned: the bridge across waterless valley on the road section of 1620-1666km and the bridge over Bidayyk River on the road section of 1666-1713km. Detailed information on the planned bridges is given below. At this time, the design works are continued on the remaining 16 sections of the road and information on bridges for these sections will be presented in the draft project.

Bridge across waterless valley on the road section of 1620km- 1666km

The bridge in the plan and longitudinal profile is located on a straight section. Dimension of the bridge carriageway D=(9.5m + DS (Dividing Strip) 3.0 + 9.5m). The bridge length is 18.1m. The size of the clearance and the number of spans for the new bridge has been approved by analogy with the existing replaceable bridge. Single-span beam-split bridge design has been developed in the project. The size of the span by the bearing axes is 17.4 m.

The size of the bridge clearance was approved given the executed hydraulic calculation and estimated flow characteristics received as the result:

Table 2.5.1 Bridge across waterless valley on the road section of 1620km- 1666 km

Water discharge Q1%, m^3/sec	Backwater before the bridge H_0, m	Critical depth of the flow under the bridge $h_к$, m	Average depth of the flow under the bridge h_c, m	Flow rate under the bridge V, m/sec
43,4	1,52	0,88	0,52	4,91

The platform of the bridge span bottom is setat mark of > 5.0 m above the ground taking into account agricultural machinery access according to the letter №28-01/04-1810 dated 09.12.2014, "KazAvtoZhol" National Company" JSC, Karaganda Oblast Branch in "Doris" LLP.

In addition to the bridge, the projected road provides small artificial structures - round and rectangular reinforced concrete pipes in the amount of 30pcs. Detailed description of the existing and planned artificial structures is given in the draft report for the section of 1620 km-1666 km, and the probability of the artificial structures use for short-term movement of animals in the alignment area will be described in the RAP.

Bridge over Bidayyk River on the road section of 1666km-1713km

Bridge diagram 2x18m. The planned bridge crosses the existing riverbed at 90 degree angle. Water discharge in the riverbed is 86 m3/s.

Three-span beam reinforced concrete existing bridge over the dry riverbed of Bidayyk River has a rectangular shape and is oriented from northwest to southeast. The bridge length is 42.0 m, width 11.1m, the width of the carriageway is 8.6m, and height is 2.6m. The bridge carriageway surfacing is made of asphalt-concrete, sidewalk is missing. The edges of the bridge have a fencing with the height of 1.2 m. Supports of the bridge have rectangular shape. The slope near ledges is firmed by reinforced concrete slabs of 1.5x0.8m dimension. State of the slabs is satisfactory. The bottom of the riverbed near the bridge is concreted. The bridge formula is 14.2+12.1+15.7.

The planned bridge is located in the plan in a circular curve with the radius of 5000m and on the longitudinal slope of 2%. The bridge is designed according to the scheme 2*18m separately for each traffic direction. The total length of the bridge is 36.21m. Dimension of the bridge: D-(2x11.5) + 2x0.75m. Clear opening height is 5.20m, approved for the passage of agricultural machinery. Carriageway for each traffic direction includes two lanes 3.75m wide, as well as the adjacent safe margins 2.0m wide. The total width of the dividing strip between the traffic lanes of different directions on the bridge, as well as on the main road, is 4.0 m. There are service passages with the width of 0.75 m on both sides of the bridge.

2.6 Borrow Pits and Construction Materials

Natural sources for aggregates suitable for road construction are available in the needed quantities in the along the road alignment areas. Locations of the licensed borrow pits at each road section will be determined by the designers.

District Akimats and all other authorized institutions provided permits for the existing subsoil reserves and borrow pits, including environmental permits. It is available for use by the contractor depending on the contractor's precise requirements. The contractor is not normally interested in direct ownership of a borrow pit and enters into a contract with the owner/operator of the borrow pit to purchase the specified amounts of materials that are necessary for the project implementation.

The road contractor is responsible for maintaining the general public and private access roads between the borrow pit and the construction site.

Direct extraction of materials from the river beds is not allowed and is not approved by the Committee for Water Resources. Normally, borrow pits are not allowed to be established within the range of less than 500 meters from any river.

All proposed borrow pits require approval from a range of local authorized institutions, including inter-regional commissions. The EIA project must be developed by the owner/operator. When the contractor submits its application, it must attach the EIA along with all the documentation and expertise conclusions to Oblast Department for Environment Protection to obtain permits for emissions and impacts. The final approval process includes the requirement that in a borrow pit opening stage the removal and storage of fertile topsoil must be carried out, and then, the fertile topsoil must be re-cultivated after the borrow pit closure. This document will be prepared after signing the prospecting and extraction contract. The general approval process for a new borrow pit from Oblast and District authorized bodies may take up to 2 years. Therefore, contractors will likely use the existing borrow pits with the existing permits. Permits from water resources protec-

tion authorities are not required; however, the EIA should contain the description of impacts on surface and groundwater resources.

For the existing borrow pits defined by the Design Engineers, all the EIA procedures have been completed and environmentally accepted. There will be no adverse impacts on surface and groundwater resources, as well as other aspects. Nevertheless, once the borrow pits that are used will have been identified by the Contractor, due inspection will be carried out to confirm that those borrow pits are operating or operable in an appropriate manner.

Out of the eighteen road sections under Karaganda-Balkhash-Burylbaital road section of the Centre South Road Corridor construction, detailed design for two road sections only is under completion. These sections are between 1 620 km to 1 666 km and between 1666 km to 1 713 km. Construction materials borrow pits and soil reserves along the alignment in these sections that have been suggested by the design engineers are specified below:

1 620 km -1 666 km Section

For the construction of pavement, imported stone materials and local materials will be used, which will be provided by different suppliers, as it is shown in the table below:

Table 2.6.1 Construction Materials Borrow Pits in 1 620 km-1 666 km Road Section

Construction materials	*Borrow pits*	*Status*	*Suppliers*
Sand-gravel	Karabass borrow pit, Kalagirskoye field.	Existing	"Karaganda Neruda" LLP, "MetallTerminalTrade" LLP
Crushed stone	Karabass borrow pit	Existing	"Karaganda Neruda" LLP
Concrete	Produced on-site	Existing	
Bitumen	-		Pavlodar Refinery
Hot asphalt-concrete	-		Asphalt-ConcretePlant at 1640 + 50km.

In the survey process, the design area was surveyed for the availability of soils that are suitable for use in the road reconstruction.

Fig. 2.6-1 Mapofsoilborrowpitsfor reconstruction of 1620km- 1666km road section

In conduct of geological engineering survey, four subsoil reserves that can be used in the construction of the roadbed have been explored:

Table 2.6.2 Subsoil reserves in 1 620km-1 666 km Road Section

No.	*Subsoil Reserve*	*Material*	*Status*	*Distance from the road, km*
1	Reserve №1 1620+400 kmof Almaty-Karaganda road	Loamy soil	Explored/ proposed by the Designers	110 meters from the road axis, soil-vegetable layer capacity is 0,1 m
2	Reserve № 6 1645+950 km	Fusible clay soil	Explored/ proposed by the Designers	87 meters from the road axis, soil-vegetable layer capacity is 0,2 m
3	Reserve № 8 1657+300 km	Fusible clay soil	Explored/ proposed by the Designers	145,5 meters from the road axis, soil-vegetable layer capacity is 0,1 m
4	Reserve №9 1664+450 km	Loamy soil	Explored/ proposed by the Designers	135 meters from the road axis, soil-vegetable layer capacity is 0,2 m

1 666 km -1 713 km Section

Construction materials for reconstruction of 1666-1713 km road section will be supplied by the enterprises located nearby as shown in the table below:

Table 2.6.3 Construction materials borrow pits within 1666 km-1713 km road section

Construction Material	*Supplier*	*Borrow Pit*	*Borrow Pit Status*
Sand	"Gaukhartas" LLP	The borrow pit is located 2.3 km from Bereznyaki village	Existing
Fractional crushed stone	"KaragandaNeruda" JSC	"Karabas"	Existing
Fractional crushed stone	"Nova Zinc" LLP	"Akzhal"	Existing
Fractional crushed stone	"Nepz-D" LLP	The borrow pit is located 18 km north from the city of Balkhash	Existing

Characteristics of the material, data on borrow pits performance, as well as recommendations for use are given in the "Bulletin of Deposits and Other Sources of Construction Materials" in accordance with the results of laboratory tests and data provided by the manufacturers.

The following five soil reserves have been explored for the roadbed construction:

Table 2.6.4 Soil reserves within 1666 km-1713 km road section

No.	*Soil Reserve*	*Material*	*Status*	*Area, ha/ Distance from the road, km*
1	Reserve №1 PK 89 + 50 - PK 96 + 93	Soil	Explored/ proposed by the Designers	27.42 ha./ 0.15 km to the right
2	Reserve № 2 PK 183+ 95 - PK 190 + 36	Soil	Explored/ proposed by the Designers	23.69 ha./ 0.27 km to the right
3	Reserve № 3 PK 289 + 35 - PK 294 + 75	Soil	Explored/ proposed by the Designers	32.7 ha./ 0,19 km to the right
4	Reserve №4 PK 412 + 94 - PK 417 + 74	Soil	Explored/ proposed by the Designers	14.85 ha./ 0,13 km to the right
5	Reserve №5 after the existing 1 713 km sign	Soil	Explored/ proposed by the Designers	15.25 ha./ 0,16 km to the right

The reserves that are under exploration occupy low-value grasslands. Location of soil reserves, soil peculiarities and guidelines for its use, as well as data on transportation distance are specified in the soil reserves passports.

The Designers have commenced works for the remaining twelve (12) sections in early June 2015, and currently works are being carried out, in particular, in relation to the existing legal borrow pits and subsequent approval from the District Akimat, as well as other responsible institutions, including environmental approvals. These borrow pits are available for use by any contractor depending on the specific requirements of the contractor. The final decision in respect of the borrow pits selection will be made by the Contractor, and additional new borrow pits may be required. The contractor usually does not own and is not interested in the possession of a borrow pit. The contractor enters into a contract with the owner/operator of the borrow pit in order to acquire a certain amount according to the specification. The contractor will be responsible for the content of any public and private access roads between the borrow pit and construction site.

2.7 Roadbed Construction

In the roadbed construction, loosening of the existing top layer to a depth of 30 cm is provided, then the alignment, profiling, after sealing and soil filling up is done to the design level. Vegetable mold that is subjected to removal is all over the band near the road. The average vegetable mold capacity is 0.15 m.

In the area of the bridge over the waterless valley, the roadbed of accesses in the sections of junction to the extreme supports is widened to 1.0 meters on each side of the support. Embankment slopes are constructed with a slope of 1:1.5 and fixed at the full height with the monolithic reinforced slabs 15 cm wide with the size of 2.5×2.5 m by the crushed stone layer 15 cm thick.

In widening the existing embankment with the height of up to 2 m, the surface of slopes should be loosened; ledges construction is provided for the height of the existing embankment of over 2 m.

Particular attention in the roadbed construction should be given to thorough layer-specific soil compaction in the embankment. The subsequent layer filling is only allowed after leveling and compaction of the underlying layer with the help of road rollers to the desired density with water irrigation.

In slopes flattening and in the widening, new roads construction and exits fixing sections, removal of soil-vegetable layer (SVL) with the thickness of 15 cm and its moving outside the right of way is carried out.

After the roadbed reconstruction, SVL application will be provided for the slopes with the thickness of 20cm, as well as mineral fertilizers will be applied and perennial grasses will be planted by mechanized method.

3 ANALYSIS OF ALTERNATIVES

3.1 Alignment Alternatives

The Centre South Road Corridor Project will comprise the upgrading of the existing, Karaganda – Balkash - Burylbaital road section from 2-lanes single carriageway to 4 -lanes dual carriageway. This route is the only road that links the Centre South Corridor. Therefore there are no available alternative routes to be considered and the existing route was considered to be the only viable alternative. For this project, the alternative of "no-project" would exacerbate current traffic situation resulting in traffic congestion and further delay in travel time, air pollution and further deterioration of economics as well as environmental and social conditions.

During the conceptual design and feasibility study in connection to the existing alignment, no alternative alignment options were considered. It is considered that the widening of the above-specified 14 sections of the existing alignment, as defined in this report, are the most suitable in road safety and environmental impact terms, which will result in the minimum environmental and social impacts. The existing alignment widening has the maximum social benefits.

There are several villages and settlements along the alignment where bypasses need to be constructed. In Karaganda oblast bypasses are planned through the following settlements: Kurma v., Zhumabek v., Aksu v., Aksu-Ayuly v. Saryshagan v. and Balkhash town, in the area of Akshatau v. near the service facilities. Bypasses were discussed with local people during the public hearings, and they will be constructed in accordance with the decisions made in the result of public hearings.

The existing road along the above-mentioned settlements of the Category III, passes through the densely built-up area. Along the road there are private sector, service facilities, gas stations, poultry farm, etc. During the reconstruction of the road under the I-b category it is stipulated widening of the roadbed for 20-40 meters, which leads to further demolition of the structures, and also it is not maintained the distance to the building line during the passing through Settlements, which is a violation of traffic safety.

In addition to these road sections, the intensity is over 7000 cars per day, according to the requirements of SNIP RK 3.03-09-2006 * "Highways" is according to I-B category, with an estimated speed of 120 km/h. In accordance with paragraph. 4.1.10 SNIP RK 3.03-09-2006 * Highways I-III technical category should be designed to bypass the settlements with the construction of turnoff to them.

After the completion of the detailed design of the road sections and after considering of alignment alternatives, the final version of the project will be approved by the state expertise, the Committee for Roads and the regional akimats.

Preliminary information in relation to the proposed by-passes of the settlements along the existing road presented in Table 3.1.

Table 3.1 Preliminary data of the bypasses of the settlements along the route section

№	Settlements	Length on existing road, km	Length to bypass of the settlements, km
1	Kurma	6,8	7,7
2	Zhumabek	6,8	7,7
3	Aksu	4,0	3,8
4	Aksu-Ayuly	8,8	8,2
5	Balkhash	22,0	15,0
6	Sarushagan	5,0	7,0

There will be no essential changes within the road sections in Karaganda and Zhambyl oblasts, other than widening of the road from under 1b category which will result in land acquisition.

3.2 Environmental Impact in Case of Project Withdrawal/No Project

Reconstruction on the existing road through the settlements increases the amount of traffic accidents (hereinafter - TA) with a high probability of occurrence of congestion in connection with the following circumstances:

- A sharp speed decrease, mainly due to lack of visibility. In this case, at the time of high-intensity and high-speed it is possible car accidents. Such sites usually have a reduced capacity;
- Change the speed due to the presence of small radius of the curves on the road;
- Merger or crossing of traffic flow at road crossings ramps, junctions acceleration and deceleration lanes;
- The location of bus stops, rest areas, etc., where there is a possibility of sudden appearance of pedestrians, pets, as well as transports from the roadside line;
- Reduction of the estimated speed from 120 km/h to 60 km/ h, in some places up to 40 km/ h.

Rejection of the project means that all future traffic will pass through the exciting road. This will cause a significant adverse impact on the existing settlements along the road. It will increase the level of noise and vibration, increase of dirty-air and worsen road safety for the local population and road users, especially pedestrians. Crossing the road will become more dangerous, and the inhabitants of roadside populations are physically separated by the existing road. Increase traffic congestion on the roads, which would entail substantial economic consequences. The overall quality of the environment and social conditions deteriorate along the existing road. Due to the increasing traffic on the route "Astana-Almaty", air quality will deteriorate, and the noise level will increase. Maybe it has a significant impact on the residential areas along the route.

Project withdrawal implies that all the future traffic flows will pass through the existing road. It will result in significant negative consequences for the existing villages along the road. Noise and vibration level will be increased, air pollution will be increased, and road safety will be deteriorated for local population and road users, in particular, pedestrians. Crossing the road will become more hazardous and the roadside communities will be physically segregated between the different sides of the existing road. Traffic congestion will be increased, which will result in significant economic consequences. In general, environment and social conditions quality would be deteriorated along the existing road. Due to increased traffic volumes within Astana – Almaty direction, the quality of

atmospheric air will be deteriorated and the noise level will be increased. There might be considerable impact on the residential areas along the alignment.

3.3 Environmental Impact in Case of Project Implementation

The widening alternative includes widening of the existing carriageway to 4 lanes with a dividing strip. Environmental aspects result in the works impact on air and water environment, operation of large construction machinery, stone-crushing and concrete plants, borrow pits. Potential negative impact issues are reviewed in detail in the Section 6.

Conclusions

Project withdrawal **(**No Project**)** will have significantly, larger adverse impacts on the environment and social conditions in settlements along the exiting road. Danger to local road users and pedestrians will be increased. The selected alternative, which involves proposed widening of the existing road, will be bypassing the settlements, as necessary, and impacts on local communities will be minimal. There will be insignificant short-term disturbance to agricultural activities during construction that is related to land acquisition. Landowners may experience some inconveniences due to possible disturbance of irrigation system and lack of exits to the land plots during construction. There are no expected impacts on natural complex. In general, it is considered that the selected alignment proposes the best environmental approach to solving the problems with the existing road and encouraging better economic development and improving transport connectivity based on the environment protection point of view.

4 LEGAL AND INSTITUTIONAL FRAMEWORK

This section presents an overview of the policy/legislative framework, as well as the environmental assessment guidelines of the Republic of Kazakhstan that are applicable to the proposed project. This section also identifies relevant World Bank Safeguard Policies that will be applied in the Project.

4.1 General Legal Framework

Environmental protection is administered in Kazakhstan by the Ministry of Energy of the Republic of Kazakhstan (ME RK); this Ministry has been established during reorganization of the Government of the RK in August 2014. The Ministry has taken functions and responsibilities of the liquidated Ministry of Oil and Gas of Kazakhstan, the Ministry of Industry and New Technologies and the Ministry of Environmental Protection and Water Recourses. The Environmental Code of the RK was adopted in January 9, 2007. It is the basic legislative framework that regulates environmental protection activities. Three main laws (the Law of the RK "On Environmental Protection", the Law of the RK "On Environmental Expertise", the Law of the RK "On Atmosphere Air Protection") were abrogated and subsequently integrated into the Environmental Code. Moreover, 80 normative legal acts were abrogated after the adoption of the Environmental Code.

4.2 Environmental Impact Assessment

All the EIA process requirements are described in the Environmental Code. The basic document for the EIA report development is "Instructions of Environmental Impact Assessment for the Planned Economic and Other Activities in Pre-Planning, Planning, Pre-Project and Project Documentation Development" approved by the Order of the Minister of MEP dated June 28, 2007, No.207-p.

According to the Instructions, there are four stages:

1) Review of Environmental Conditions;
2) Preliminary Environmental Impact Assessment (EIA);
3) EIA;
4) "Environmental Protection" Section

The first stage of the EIA, "Review of Environmental Conditions", includes description of general characteristics of natural and socio-economic environment in the area that was planned for construction, analysis of practical use of this area and determination of principal EIA positions.

The second stage of the EIA, "Preliminary EIA", defines potential possible changes of components of natural and socio-economic environment. The purpose of this stage is to assess environmental condition in the project area, identify potential impacts of the project, and develop mitigation measures for such impacts, as included in the project feasibility study section. Results of this stage must be included in the project feasibility study. All materials that influence decision-making (EIA report, minutes of public hearings, permits and other supporting documents) must be reviewed by competent environmental authorities within the procedure known as "Ecological Expertise" (EE). Ecological Expertise is carried out by the Ministry of Energy for the I environmental category pro-

jects, as well as by its territorial divisions for the II and III categories, and since 2007 – by local authorities (territorial department for environmental protection) for the IV category enterprises. It is also possible to resort to the held of external experts, however, they will play a consultative role only. Services provided by these experts are paid by project developers, and the so-called public expertise may be conducted by independent experts. However, the final documents (expertise results and permits) are not available to the public view, and, sometimes, even to field inspectors.

According to Article 36 of the Environmental Code, "Environmental Impact Assessment is obligatory for all types of economic and other activities that can have direct or indirect impact on the environment or health of the population". The procedure on public hearings is regulated by the Order of the Minister on the Rules for Public Hearings Conduct, 2007. The EIA and State Environmental Expertise (SEE) are two interconnected procedures. The developer must conduct the EIA procedure, which is carried out by licensed private companies and is in charge of preparing the whole EIA documentation. The EIA procedure is a two-phase process: the EIA itself and the SEE. Once the EIA is approved, the developer must apply for the SEE. The competent authorities verify the quality of documents, provide their own assessment and return both documents to the developer. In assessment, opinions and points of view expressed by the public and other authorities, which have been involved in the process, are taken into account. The EIA procedure is performed before the permits delivery procedure, and the developer must enclose the EIA report and the expertise statement together with the emissions permit application. The EIA procedure takes about two months, and the SEE procedure – up to three months. The post-project is obligatory and is carried out by the competent authorities one year after the construction completion. Experience in others IFIs-financed projects in the country shows that the authorities are proactive and compliant with supervision regulations for the project with potential significant environmental aspects.

It is forbidden to implement projects or finance it by banks or other financial institutions without a positive resolution of the State Ecological Expertise. The positive conclusion of State Ecological Expertise that is issued for the project is valid within ten years from the date of its issuance.

In case of new projects, land acquisition must be agreed with environment protection authorities, despite the fact that land acquisition is performed by akimats (sub-national administration). At this stage, the project developers are obliged to assess general environmental conditions and submit results together with the Declaration of Intent for ecological expertise. The Declaration should be discussed with the population at public hearings organized for these purposes. If the expertise result is positive, the land plot may be allocated to the project employer.

The "Preliminary EIA" is required at the feasibility study stage, when the project options and solutions are considered. Field studies should be also conducted at this stage for large-scale projects. Possible impacts should be described, but precise emission calculations are not expected. The feasibility study, including all the environmental-protection-related documentation, is then submitted for the Environmental Expertise. This Environmental Expertise is carried out by the staff of the Ministry of Energy or its departments at the local level, depending on the project scale.

The approved "Preliminary EIA" is necessary to receive funds for the project implementation; therefore, it may influence positive or negative decision for the project feasibility study. The next stage implies a comprehensive EIA report. At this stage, very detailed information is required, including calculations of emission limit values (ELVs), emergency plan, pollutants monitoring programs, etc. This documentation must be submitted for review by competent authorities. If design documentation undergoes any changes later (e.g., changes in engineering procedures), the developer is required to adjust the EIA materials accordingly. Such adjustments must be also agreed with competent authorities.

Finally, the "Post-Project EIA" must be prepared for large-scale projects with investments of over 50 million US dollars one year after the works commencement for this project. It is done to confirm that the environment has not suffered as the result of the project implementation and to improve the Environmental Management Plan during the project operation.

Public hearings are required to be held at all EIA stages. Minutes of meetings for these hearings are an integral part of the EIA documentation. Although the 1st public hearings' quality and method may have not always corresponded to the good international practice, as described in international agreements (e.g., Aarhus convention), its wide application allows advancing the principle of public participation in Kazakhstan and to be reflected not only in procedural guidelines, but in real practice also. The second public hearings will be organized to meet the requirements for category 1 of the project.

Table 4-1 Legislation and regulations governing the EIA Process

Law	**Date and Registration Number**
Methodology for Determining Emissions Standards to the Environment	Approved upon the Order of the Minister of the MEP on May 21, 2007, No. 158-p.
"Instructions for Environmental Impact Assessment Conduct resulted by the Planned Economic Activities in Pre-planning, Planning, Pre-Project Documentation Development"	Approved upon the Order of the Minister of the MEP, on June 28, 2007, No. 204-p"
The Amendments to the Order of the Minister of Environment Protection of the Republic of Kazakhstan on Approval of "Instructions for Environmental Impact Assessment Conduct resulted by the Planned Economic Activities in Pre-planning, Planning, Pre-Project Documentation Development"	Approved upon the Order of the Minister of the MEP on March 20, 2008, No.62-p".
Provisions for the State Environmental Expertise Conduct	Approved upon the Order of the Minister of the MEP on June 28, 2007, No.207-p".
The Amendments to the Order of the Minister of Environment Protection of the Republic of Kazakhstan on Approval of Provisions for the State Environmental Expertise Conduct	Approved upon the Order of the Minister of the MEP on October 9, 2007, No.296-p".
Regulations for Public Hearings Conduct	Approved upon the Order of the Minister of the MEP on May 7, 2007, No.135-p".
Instructions for the Qualifying Requirements to the Licensed Activities on Environmental Design, Environmental Impact Assessment Control and Development	Approved upon the Order of the Minister of the MEP on October 21, 2003, No.239-p".
Methodological Guidelines to the Licensed Activities on Environmental Design, Environmental Impact Assessment Control and Development	Approved upon the Order of the Minister of the MEP on February 10, 2005, No.51-p".
Final Environmental Supervision Experts Opinion on Definition of the Licensed Works and Services Types	Approved upon the Order of the Minister of the MEP on July 1, 2004, No.192-p".
Environmental Protection Standards for the Licensed and Qualifying Requirements on Works	Approved upon the Order of the Minister of Environmental Protection on June 5, 2007, No.457-p".

Implementation and Services Provision in the Field	
Environmental Code of the Republic of Kazakhstan	January 9, 2007, No.212-p".
Law of the Republic of Kazakhstan "On Amendments and Additions to Some Legislative Acts of Kazakhstan on Environmental Issues"	January 9, 2007, No.213-p".
Law of the Republic of Kazakhstan "On Ratification of the Stockholm Convention on Persistent Organic Pollutants"	June 7, 2007, No. 259-p".
The Concept of Transition to Sustainable Development in 2007-2009 (Action Plan)	Upon the Order of the President of the RK, November 14, 2006, No. 216-p".
The Concept of Environmental Safety of the Republic of Kazakhstan in 2004-2015	Upon the Order of the President of the RK, December 3, 2003, No. 1241

4.3 Transport Law

The Law of Republic of Kazakhstan "On Roads" dated July 17, 2001 determines the basic legal, economic and organizational principles of governance for roads in the Republic of Kazakhstan. The Law on Roads covers all aspects of roads development and use, including design, construction, traffic requirements, dimensions for roads and land plots provision.

According to the Law of the RK "On Roads" updated in 2014, the size of the right of way for projected roads for common use depends on the road category within the rules of land plots acquisition for public use roads. Mainly, it includes the I technical category roads – 35 meters from the road axis, the II technical category – 20 meters, the III technical category road – 15 meters, the IV technical category – 13 meters, the V technical category – 12 meters. Land plots of right of way are in the possession and use of road authorities or concessionaries, and are intended only for the development, improvement of roads and placement of road services.

4.4 Air Quality Standards

The atmosphere air quality standards provide permissible limits of the pollutants content both, in residential and industrial areas. The main terms and definitions related to the atmosphere air pollution, monitoring programs, behavior of pollutants in the air are determined by GOST 17.2.1.03-84; "Environmental Protection. Atmosphere. Terms and Definitions for Pollution Control".

The regulatory document containing information on pollutants in the atmosphere air is "Sanitary and Epidemiological Requirements for the Atmosphere Air Quality" approved upon the Order of the Minister of Healthcare of the RK № 629 dated 18.08.2004.

The pollutants emission in the atmosphere air by the stationary sources is allowed only on the basis of the permit issued by the authorized state bodies in the field of atmosphere air protection or its territorial subdivisions according to the procedures set out by the Government of the Republic of Kazakhstan. The permit is based on the general emissions amount, which is conditioned by the applicant (developer) and does not contain information on emissions amount for an individual vehicle.

The issuance procedure for atmosphere pollution permits during operation of a motor vehicle or other transport facilities is defined by the Government of the Republic of Kazakhstan.

All the motor vehicles of any type (including buses and trucks) are required to pass an annual technical inspection, which includes pollutants emission test, and which must be carried out in accordance with the requirements of legislative regulations specified below.

Table 4-2 Documents regulating Atmosphere Air Protection

Instruction on Agreement and Approval of the Design Standards for the Maximum Permissible Emissions (MPE) and Maximum Permissible Discharges (MPD)	The Order of the Ministry for Environmental Protection of the RK No.61-P dated 24.01.2004
Compendium of Methods for Calculation of Pollutants Emission to the Atmosphere by Different Types of Production	The Order of the Ministry of Ecology and Bio resources dated 01.12.96. *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry of Environmental Protection No 324-pdated October 27, 2006*
The Inventory Rules for Pollutants Emission, Harmful Physical Effects on the Atmosphere Air and Its Sources	The Order of the Ministry of Environmental Protection of the RK No.217-pdated August 4,2005
Methodology for Calculation of the Pollutants Concentrations in the Atmosphere Air that are contained in the Enterprises Discharges. Guiding Normative Document 211.2.01.01-97	The Order of the Ministry of Ecology and Bio Resources dated 01.08.1997. *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry of Environmental Protection No 324-pdated October 27, 2006*
Methodology for Calculation of Pollutants Concentrations in the Atmosphere Air resulted by the Enterprises Discharges	Approved upon the Order of Minister of Environmental Protection No.100-pdated April 18,2008 (Appendix 18)
Recommendations on Registration and Maintenance of Projects Standards for the Maximum Permissible Emissions (MPE) in the Atmosphere resulted by the Enterprises of the Republic of Kazakhstan. Guiding Normative Document 211.02.02-97	The Orders of the Minister of Ecology and Bio Resources of the RK dated August 1, 1997 and Order of the Ministry of Natural Resources and Environmental Protection of the RK No. 156 dated 06.07.2001 *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry of Environmental Protection No.324-pdated October 27, 2006*
Instructions for Pollutants Emission Rate Setting to the Atmosphere of the Republic of Kazakhstan	The Order of the Ministry of Natural Resources and Environmental Protection of the RK No.516-P dated 21.12.00 *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry of Environmental Protection*

	No.324-p dated October 27, 2006
Calculation Procedure for Motor Vehicles Emissions for Carrying Out the Summary Calculations of Atmosphere Pollution Guiding Normative Document 211.2.02.07-2004	The Order of the Ministry of Environmental Protection of the RK No.324-pdated October 27, 2006 *Included in the List of current regulatory legal acts in the field of the environmental protection, the Order of the Ministry of Environmental Protection No.324-pdated October 27, 2006*
Calculation Procedures of the Specific Pollutants Emissions in the Atmosphere and Damage Depending on the Type of Fuel Used in the Republic of Kazakhstan Guiding Normative Document 211.3.02.01-97	The Order of the Ministry of Ecology and Bio Resources dated 09.07.97. *Included in the List of current regulatory legal acts in the field of the environmental protection, the Order of the Ministry of Environmental Protection No.324-pdated October 27, 2006*
Calculation Procedure for Pollutants Emission resulted by the Motor Transport Enterprises	Approved upon the Order of the Minister of Environmental Protection No.100-pdated April 18, 2008 (Appendix 3)
Rules of State Accounting of the Sources of Greenhouse Gases Emission into the Atmosphere and Consumption of Ozone-Destroying Substances	The Governmental Decree No 124 dated February 8, 2008
Rules of Restriction, Halt or Reduction of Greenhouse Gases Emissions into the Atmosphere	The Governmental Decree No.128 dated February 11,2008

4.5 Water Quality Legislation and Standards

The main document in the field of water resources protection and its use is the Water Code of the Republic of Kazakhstan No. 481 dated July 09, 2003. According to the definition provided in this document, "Water Bodies Protection" is an activity aimed at conservation, rehabilitation and reproduction of water bodies, as well as prevention of adverse impact of water.

I. According to Article 112, water bodies shall be protected from:

1) natural and industrial pollution by hazardous chemical and toxic substances and its compounds, as well as thermal, bacterial, radiation and other types of pollution;
2) pollution by hard, non-soluble subjects, production and household and other wastes;
3) exhaustion.

II. Water bodies shall be protected to prevent:

1) disturbance of the environmental stability of natural systems;
2) causing harm to the lives and health of population;
3) reduction of fishery resources and other water fauna;
4) deterioration of the water supply conditions;
5) weakening of the natural self-reproduction and cleansing functions of the water bodies;
6) other unfavorable conditions that negatively affect physical, chemical and biological qualities of water bodies.

III. Protection of water bodies is carried out through:

1) taking into consideration general requirements for water bodies protection to all water users who use water for any purposes;
2) improving and applying water protective measures with the help of new equipment and environmentally and epidemiologically safe technologies;
3) establishment of water conservation zones, water bodies protection zones, sanitary protection zones for drinking water supply sources;
4) execution of public and other forms of control over the use and protection of the water bodies;
5) applying sanctions for non-observance of the water protection requirements.

IV. Central and local execution authorities of oblasts (cities of republican significance, capital), in accordance with the legislation of the Republic of Kazakhstan, take measures that are in compliance with the principles of sustainable development towards water resources conversation, prevention of pollution and blockage.

V. Individuals and legal entities, activities of which affect the water bodies, are obliged to comply with environmental requirements set out by the environmental legislation of the Republic of Kazakhstan, as well as provide organizational, technological, forestry and land reclamation, agro technical, hydro-technical, sanitary-epidemiological and other activities, which ensure protection of water bodies from pollution, blockage and exhaustion.

Article 116 of the Code regulates issues related to the water protection zones: to maintain water bodies and water facilities in the condition required by the hygiene-sanitary and environmental norms; to prevent pollution, blockage and exhaustion of the surface water; as well as water protection zones and belts are required to preserve flora and fauna.

While developing any project, which may have any impact on the water system/resources, the project design should be agreed with the local executive bodies responsible for water resources protection. The Water Code was initially adopted on March 31, 1993 and is still valid in the Republic of Kazakhstan. The Government has approved the *Conception for the Development of the Water Sector within the Economy and Water Policy until 2010,* as well as approved *the Sectoral Program for Drinking Water.*

In developing the Water Code, the Government of the Republic of Kazakhstan has adopted normative acts for procedures on permits of water reservoirs use for special needs, procedures for permits issuance for special water use, procedures for water use for fire-fighting needs, classifying water ways as navigable routes, and for using water reservoirs for air traffic needs. The Government has developed a list of water bodies (underground waters) that have health-improving significance in the country, as well as water bodies that have special state significance or special value, which restricts or completely prohibits its use.
The maximum permissible concentrations (MPC) of pollutants have been developed for the water standards, just as for the atmosphere air standards. As a rule, the MPC for fishing water reservoirs are stricter than MPC for drinking water reservoirs. It is necessary to emphasize that this refers primarily to the fish industry, and the human needs protection was taken here into account, probably, through water ecosystems protection principles.

Same as in case of atmosphere air, various indices, which enable the consideration of the presence of several pollutants, are used for comparative assessment of the water pollution. The most widely

used index is Water Pollution Index (WPI). The basic document regulating the condition of the surface waters and content of the pollutants is the "Sanitary and Epidemiological Requirements for the Surface Water Protection Against Pollution" No. 3 dated 02.03.04 approved upon the Order of the Ministry of Healthcare of the RK No.506 dated 28.06.2004.

The legislative, regulatory and procedural documents applicable on water protection are listed below:

Table 4-3 Water resources protection legislation

Recommendations on Execution and Content of the Design Standards of the Maximum Permissible Discharge (MPD) in the Water Bodies for the Enterprises of the Republic of Kazakhstan.	The Order of the Ministry of Ecology and Bio Resources of the RK 1992. *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry of Environmental Protection No.324-pdated October 27, 2006*
Instructions on Rate Fixing for Pollutants Discharge into the Water Bodies of the Republic of Kazakhstan Guiding Normative Document 211.2.03.01-97	The Order of the Ministry of Natural Resources and Environmental Protection of the RK No. 516-pdated 21.12.00. *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry of Environmental Protection No. 324-p dated October 27, 2006*
The Calculation Procedure for Standards of Discharged Waters with Pollutants (MPD) into the Water Bodies, Disposal Fields and Relief of Land	Approved upon the Order of the Minister of Environmental Protection No. 100-pdated April 18, 2008 (Appendix 19)
The Procedure of Establishment of the Maximum Permissible Discharge (MPD) of the Pollutants onto the Disposal Fields and Natural Depressions in the Land Relief. Guiding Normative Document 211.3.03.03-2000	The Order the Ministry of Environmental Protection of the RK No.156-pdated 06.07.2001 *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry of Environmental Protection No. 324-pdated October 27, 2006*
Recommendations on Control over the Operation of the Treatment Facilities and Discharge of the Wastewaters.	The Order of the Ministry of Ecology and Bio Resources of the RK dated 21.05.94. *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry of Environmental Protection No. 324-pdated October 27, 2006*
Rules of Surface Waters Protection in the RK Guiding Normative Document 01.01.03-94	The Order of the Ministry of Ecology and Bio resources of the RoK dd 27.06.94. *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry of Environmental Protection No.324-pdated October 27, 2006*

Guidelines on Application of the Rules of Surface Waters Protection in the RK	The Order of the Ministry of Ecology and Bio Resources of the RK dated 12.02.97. Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry of Environmental Protection No.324-p dated October 27, 2006
Procedural Definitions of Norms and Standards of Water Resources Use in Various Natural Climatic Zones of the Republic of Kazakhstan during Ecological Zoning.	Approved upon the Order of the Minister of Ecology and Bio Resources of the RK dated 1997

4.6 Soil Quality Standards

New sanitary rules in Kazakhstan based on the long-term scientific studies are - SanPiN (Sanitary Rules and Norms) 2.1.7.1287-03. "Sanitary and Epidemiological Requirements for Quality of Soil" establishes requirements on soils quality in the inhabited localities and agricultural lands and control the observance of the sanitary-hygienic standards during designing, construction, renewal (technical upgrading) and operation of the different facilities, including those which may cause the adverse effect on the soils status.

Main terms regarding chemical contamination of soils define in the GOST 27593-88. "Soils. Terms Definitions". The basic regulatory documents for control of the soil pollution is "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.

The maximum allowable concentrations (MAC) of the chemical substances in soil are the principal criterion of the sanitary assessment of the soil contamination by the chemical agents.

These standards are common for all types of land user. But there are separate assessment procedures of soil contaminations for residential and agricultural lands. The determination of the maximum allowable concentrations in the soil is based on the 4 main assessment principles.

4.7 Noise Standards

The level of the road traffic noise is determined according to the norms of the SNiP (construction norms and rules) 11-12-77 on «Noise Protection». The limit of noise generated by the motor vehicles in the distance of two meters from the buildings in compliance with the SNiP 11-12-77 (tab.1.2) is 70 dBA.

The maximum allowable noise level in areas neighboring on the residential houses, rest areas of the micro-districts and residential groupings, school areas, playgrounds of the preschool is assumed as follows:

- for noise made by the motor vehicles - 10 dBA
- for existing residential construction - 5 dBA
- for daylight time from 7 hour till 23 hour - 10 dBA

4.8 Health and Safety during Construction and Operation

During the execution of works it is required to follow the requirements of the SNiP 3.06.04-91 on «Construction Safety». There are regulations such as the «Safety Regulations during the Construction, Repair and Maintenance of the Automobile Roads» and «Regulations for Safety and Production Sanitary during the Construction of the Bridges and Pipes», which applies during the construction of the road. During the road construction works performance it is necessary to use the «Safety Instructions» for each construction machine.

The personal protective equipment shall comply with the applicable GOSTs (special caprons under the GOST 12.4.029, rubber gloves under the GOST 20010, respirator "The Petal" under the GOST 12.4.028, gloves under the GOST 12.4.010, goggles under the GOST 12.4.013 and breathing mask of B type or B with filter, helmets).The site shall be kept in a safe, clean and good sanitary condition. The "Contractor" shall bear the responsibility for cleanup of the site from garbage, construction waste and household rubbish of the site and their removal to the municipal solid waste landfill (MSW).The "Contractor" shall be guided by the SanPiN №3.01.016.97

In addition, it is necessary to carry out routine inspection of the machinery and equipment and observance of the repair, training and instruction of the workers engaged in maintenance of the machinery, tools and equipment on safe methods and techniques of work. It is necessary to undertake the protective measures with respect to the equipment to prevent injuries and accidents. Such equipment includes the following:

- motor vehicles;
- pumps, compressors;
- generators, crushing equipment;
- lifting equipment (cranes, hoists, wire ropes, loaders);
- electrical equipment.

For provision of appropriate sanitary and living conditions for the workers it is required to establish a field camp; changing rooms, drying premises, wash rooms, shower rooms, warming premise for workers, dining facility with three meals daily, toilet facility, field office, rest room, machinery parking facility and household waste storage area. There are shall be the information on safety, occupational health, production and household sanitary in the rest room. There shall be medicine boxes, first-aid outfit, drinking water and service water shall be kept in the separate containers, which will be provided in the construction sites and field camps. The drinking water shall be located at the distance of maximum 75 m from the working area. The water permit shall be obtained from the sanitary supervision and disease control authorities and comply with the requirements of the SanPiN of the RoK № 3.05.017.97.

It is allowed to perform works during the hours of darkness ensuring that artificial lighting is in accordance with the standards of the electric lighting for the installation and construction works. Irrespective of the lighting of the sites and working areas the machinery shall be equipped with the independent (built-in) lighting of the working elements and control devices.

The storage of all types of fuel and chemicals they shall be stored in the special location with the mandatory barbed wire fence. The storage area shall not be located near the water source and depressions. The filling and unloading of materials shall be strictly controlled and performed in accordance with the established procedure. All screws and valves must be protected from undesirable interference and vandalism. Also, they should be easily opened and closed during the use. The inner surface of containers with fuel and chemicals should be kept clean. Measurements shall be made without the effect of moisture and water.

4.9 Archeological and Cultural Heritage

Historical and cultural recourses include monuments, structures and works of art, sites of outstanding historical importance, aesthetic, scientific ethnological and / or anthropological point of view, including cemeteries and burial. Responsibility for the preservation, maintenance and assessment of historical and cultural values in Kazakhstan are entrusted to the Regional Department of Culture and Arts of the Ministry of Culture and Sports.

One of the issues considered during construction of the road is the preservation of the historical and cultural monuments which include certain structures, memorials and other objects associated with historical events of people's life. The works of material and spiritual creativity are representing historical, scientific and artistic value (old constructions, burial, archaeological sites).

The main legislative documents on cultural heritage are the followings:

- The Law of the Republic of Kazakhstan "About Culture", dated 15.12.2006
- The Law of the Republic of Kazakhstan "On Protection and Use of the Historical Cultural Heritage", dated 2.07.1992
- The Land Code of the RoK, dated 20.06.2003

For the purpose of recording and protection of the historical and cultural monuments they are divided into the following categories:

- Historical and cultural monuments of international status representing the historical, scientific, architectural, artistic and memorial objects included in the UNESCO World Heritage List;
- Historical and cultural monuments of national status representing the historical, scientific, architectural, artistic and memorial objects, having the special significance for the history and culture of the whole country;
- Historical and cultural monuments of local significance representing the historical, scientific, architectural, artistic and memorial objects, having the special significance for the history and culture of the oblasts (city of republican status, capital), regions (cities of oblast sub ordinance).

According to the article 127 of the Land Code of the Republic of Kazakhstan dated June 20, 2003 № 442-II construction works without conducting of the archeological expertise are related with the risk for project.

According to Article 39 of the Law of the Republic of Kazakhstan "On Protection and Use of the Historical Cultural Heritage". That is after the complete archeological survey of the monuments located in the construction zone of the road and deregistration them from the State record.

- During the development of the territory before the allocation of the lands shall be made survey research to identify the objects of historical-cultural heritage.
- In case of detection of the objects having historical, scientific, art value, individual and legal entities are obliged to suspend further work performance and inform about it to the competent authority.
- It is prohibited to carry out works that may make danger to the existence of historical and cultural heritage.

Any works that could endanger the existing monuments are prohibited. Enterprises, organizations, institutions, public associations and citizens in case of detection of archaeological and other sites of historical, scientific and cultural value, are obliged to inform the competent preservation and use authorities of historical and cultural heritage, and to stop the ongoing work.

4.10 Comparison of Kazakhstan Environmental Legislation and World Bank Policies

An evaluation of the national environmental protection legislation of the Republic of Kazakhstan and WB procedures and its meaning for the Project is presented in this chapter. The environmental legislation of Kazakhstan mainly has been developed to provide control of activities and to control adverse impacts on the environment and human health. The submission of EIA for Ecological Expertise is not all the time complies with best international practice, which includes a significant component of ongoing evaluation in an iterative process. The preparation of EIA in Kazakhstan is more statistical process, which more focusing in the calculation of emissions, which charges for emissions are paid and less focusing on the analysis and conclusions with the understanding of adverse impact and measurements on their avoidance and mitigation. Data collection process for report is not always related with the goal of EIA and with the project framework.

Public procedures in Kazakhstan are not always adapted for monitoring during the project construction. For example, the Regional Department of Environment must submit an application to the prosecutor's office to conduct an audit, and can only do this once a year, with notification of the Contractor within 2 weeks prior to the audit. The content of environmental plans includes only the description of the overall mitigation and monitoring of impacts, without information on the place and the responsible entities, focusing on references on regulations and standards, and has little value for the contractors.

Standards are used as limits beyond which pollution is permitted with compensation payment.

In general, there are several governmental and public organizations involved to various degrees in the environmental protection. Here the Ministry of Agriculture, Ministry of Energy and Mineral Resources. There are special institutions in Kazakhstan such as State Environment Expertise and several research centers.

The comparison in the legislation is presented in the Table 4.10.

Table 4.10 Comparison of EIA and Kazakhstan Environmental legislation and World Bank Standards

EIA Stage	Kazakhstan	WB
Sources	Ecological Code of the RoK 2007, Ministry of Environmental Protection Order 204- dated 28 June 2007: "The Instruction of Conducting the Impact Assessment of planned economic and other activities to the Environment during the preliminary planning, pre-designing and designing documentation"	World Bank Operational Policy 4.01
Basic Principles		
Most sensitive component rule	There does not appear to be a 'most sensitive' rule. The sensitivity of project is measured by the Sanitary Epidemiological (SE) classes of dangers. There are four categories and within each, one or more levels of danger, a category 1 project has two levels of severity, either need a full EIA. A Project of category 2 corresponds to a 3rd level severity and a lesser assessment is undertaken, although still referred to as an Environmental Assessment. Category 3 and 4 projects correspond to 4th and 5th level severity, and respectively do not require an assessment.	Projects are categorized according to the most sensitive component, e.g. if 6 of 7 components are not sensitive and one is sensitive, then the entire project becomes a Category A or B.
	The planning and conduction of an assessment is the duty of the project proponent, in this case Committee for Roads of MID. MID often hire a licensed consultant to do this work, and frequently this is a member of the team who was undertaking the Feasibility Study. The assessment must be preceded with preliminary research, which must be approved before the beginning of preparation of full EIA. The EIA has 5 stages: 1) Assessment of the territory; 2) Preliminary EIA 3) EIA; 4) Chapter "Environmental Protection" in the Project Documentation; 5) Post-designed analysis.	Usually EAs are required to be prepared by the Government, and donors will request this. Often the quality of the EIA report prepared by the proponent is not insufficiently or the budget is too small or EIA is not completed or not with the compliance with the standards, in which case the consultants help to fulfill the gaps and to improve the documentation. This is a proponent focused activity, with the requirement for close collaboration and ownership. In the case of this project EIA prepared by the Designers have been improved and strengthened by International Consultants for Committee for Roads in Astana, in accordance with policies of World Bank.

EIA Stage	Kazakhstan	WB
Document Preparation		During the preparation by the donors of the pre EIA and EIA on behalf of the government, these documents are always the government's documents, and so that they must be presented as government was preparing them. In case of recommendations from consultant, this must be made clear indicated. Summaries of the pre EIA and EIA often contain the results of checking and comments from the donors or the donor's consultants on behalf of the Banks
Document Ownership	Projects of the 1 category are assessed by the MEP in Astana, Category 2 and 3 by the Oblast or Regional Environmental Protection Department, and 4 at the rayon level.	
The environmental action plan	As specified in Ecological Code Article 41 the EIA report should include "*10) Description of measures provided for preventing and mitigating impacts on environment, including proposal for ecological monitoring"—more or less a partial EAP*. This description does not comply with donors requirements and construction monitoring is far from rigorous.	The EAP is required by WB for A and B category projects, It is the chapter in the report EIS, but in the same way it is separate. It is not a separate document, but the main measurements on mitigation and monitoring can be used as a stand- separate chapter or tables.
Public consultation	Kazakhstan has a procedure of public consultation but mainly participate state sector and rarely involves a common citizen.	Public consultation is a requirement for WB. The World Bank requires 2 hearings for full EIS and 1 hearing for the projects of the category B. For full EIA reports, public hearings must be conducted at the earlier stage of EIA preparation and EAP or at the stage of the possible impact research. For the projects of the B category the public hearings on the stage of impact determination is more useful, although the exact time depends from the main ecological problems and the proponent's wishes. Public hearings must be announce and for full EIA preliminary notices about hearings and contact data must be published in the media for several weeks in advance before the hearings.

EIA Stage	Kazakhstan	WB
Classification	Projects are classified by the 5 classes of danger, where one of the classes is the highest, according to the norms and standards developed by the Sanitary and Epidemiological Services, in relation to human health and safety. This classification has a little reference to the ecology and, for-example forests and wildlife populations. As with the Banks, certain projects have been classified, the road projects are mostly related to the Category 1 with full EIA. This "dual" classification does not specify size of the facility or scope of production. The main purpose of Sanitary Rules is to establish sanitary-protection zone (SPZ), which for Category 1 facilities is not less than 1000 m for risk category I and not less than 500 m for risk category II.	Classification of activities according to risk level from I (high) to V (low) in Kazakhstan. Depending on the risk the Level of Environmental Category form 1 to 4 is assigned. Sanitary-Epidemiological Regulations specify Environmental Category through the lists of activities by sector (e.g. chemical industry, metallurgy, agriculture, etc.) and by risk category (i.e. I - V). Environmental Category 1 covers activities of the I and II risk levels. This is Classification "road widening" is not determined the size of the objects and scale of the production. The main aim of the Sanitary Rules are concluded in the established Sanitary-Protection Zones (SPZ) which are for the objects of the Category 1, not less than 1000 m, for the risk category 1, and not less than 500 m for the risk category 2.
Document Form	There is no specified requirements other than a 'minor environmental statement'	No specific documentation required
The period of the public hearings and publications	None defined	None required.
		EIA and EAC are published before the approval of the project on the local level and in the information bulletin of the World Bank. In the reports there is no requirement of the alternative.
Document Form	All EIA documentation is the separate report	Chapter in the feasibility study
Summary	Each assessment document in the end has the section "Main conclusions of the EIA". Other summaries are not required by the Code or other standards.	Executive summary - but without any special purpose.
Consultation and Information Disclosure Timing	At least one consultation is required to announce environmental mitigation measures	At least once during EIA/SiEA preparation
Consultation & In-	None specified	Not needed

EIA Stage	Kazakhstan	WB
formation Disclo-sure Timing		
Publications	It is not necessary	All EIA documentation is available on the web site of the Information Center of the borrower's country, but there is not any formal public checking.
Category A: EIA	EIA is required for the projects of class 1 according to the Sanitary and Epidemiological, which will have significant impacts on the human safety. According to chapter 26 of the EIA Instructions the third stage of EIA process – "Environmental Impact Assessment" requires detailed analysis in separate chapter of all environment impact aspects of certain objects, and include the following components: air, water, mineral resources, production wastes, physical impacts, soil, plants, animals, socio-economic condition, and ecological risks. The Category A is required to undertake the 5th stage of EIA process, Post-project Analysis, 1 year after the end of project. The 5th stage should be undertaken by other licensed organization different from the organization, which have been conducted the EIA.	
Document Form	Each stage of EIA process has its own standalone document with prescribed format and the level of detail.	Stand Alone document with prescribed format and minimum level of detail
Summary	Each of 5 assessment stages has its own standalone document; and each has a "Conclusions" chapter, which acts as a summary.	Executive Summary is prepared and incorporated to the EIA but often used separately. Executive Summary is included in this report.
Consultation and Information Disclo-sure Timing	No information on specific consultations, except for public hearing as part of the EIA – the Instructions for Public Hearing are published by the MOEP Order №135, 7th May 2007.	Minimum 2 are mandatory, with timing specified. Once with the TOR for the EIA, once to present the interim EIA. For the disclosure of the interim/ draft EIA, Category A projects must be allowed a 120-day period for stakeholder evaluation and comments between disclosure of interim/draft EIA/EMP and project appraisal. The 120 day rule will commence once this document has been completed in accordance with World Bank's requirements.

EIA Stage	Kazakhstan	WB
Disclosure	Submission of a full environmental assessment to the local /oblast-level environmental authority and its review by the central government takes 60 days. During the first 30 days there is a theoretically a time for the public to comment. But since there is no real announcement this does not happen. Further, there is a 'public debate/hearings are held as part of the final EIA approval. There is no other disclosure. This document when agreed by the Bank as suitable for public disclosure under the 120 rule will be put on the CR website in Russian. 30 days after its submission the next round of public consultation will take place.	The public must be informed about the availability of EIA documentation, which must be prepared in English and the local language (sometimes English, Russian and local language), and be accessible at convenient locations in country, at a published website and on the donors website (InfoShop) 120 days before project appraisal. Loan processing cannot proceed during this period. This document will be disclosed at WB website and CfR website once agreed by the WB as suitable for public disclosure.
Review process of Land Acquisition and Resettlement	There is no accepted the review process of land acquisition and resettlement.	`WB is required review of resettlement, land acquisition and compensation to verify compliance with all processes managed by the World Bank OP 4.12. Review Relocation Report (RRR) has been prepared by international consultants of CfR. This report is now being finalized.
Most sensitive component rule	There does not appear to be a 'most sensitive' rule. The sensitivity of project is measured by the Sanitary Epidemiological (SE) classes of dangers. There are four categories and within each, one or more levels of danger, a category 1 project has two levels of severity, either trigger a full EIA. A Category 2 project is considered a 3rd level severity and as such a lesser assessment is undertaken, although still referred to as an Environmental Assessment. A category 3 and 4 project are considered 4th and 5th level severity, respectively and as such generally do not require an assessment.	Projects are categorized according to the most sensitive component, e.g. if 6 of 7 components are not sensitive and one is sensitive the entire project becomes a Category A or B.

4.11 Conclusions and Recommendations from Gap Analysis

The following conclusions and recommendations address those issues where divergence of standards and subsequent practice between Kazakhstan and the World Bank may lead to shortcomings in

environmental due diligence during implementation, because local practice may be rigid and well established and incorporating new elements or changing practices may need extra efforts during project supervision:

a) Kazakhstan has not yet put into practice an iterative (active, constant) process of active and flexible management of designing and environmental protection for mutual incorporation of information and data from both components. Usually the design approval process in Kazakhstan (state expertise) is quite advanced when EIAs are conducted, which may lead, that recommendations based on the environmental analysis cannot incorporate changes in the design, as they would require a re-approval of the processes of the project (expertise). However, changes in the project can be implemented during the construction by the Contractor, once the contract is signed with relatively minor review and approval requirements. This option is recommended to implement any necessary changes into the project, with proposal from the Contractor to the Client's approval and further construction. Such design changes are likely to mainly concern the number and location of under- and overpasses for animals, farm traffic and wildlife.

b) In order to prevent negative impacts on the environment it will require efforts to enhance the capacity and control during the project implementation, with practical and trainings, which are ready to implement for contractors, engineers, supervision engineers, and environmental protection agencies (including forestry, water resources, national parks, etc.). It is recommended to engage a consultant with experience of the best international practice in the environmental supervision and environmental management on the first 6 months of the project realization (from the date of the mobilization of the contractor) for the transfer of knowledge and the establishment of system of compliance with international best practices from the earliest stages of the project.

c) Site-specific EAP will be prepared and included in construction contracts.

d) The competences and powers of Kazakh environmental authorities are very limited, with limited numbers of legal inspections per year and it is necessary to notify the owner of the project on the forthcoming audit a few weeks in advance. Although this procedure is not likely to be changed in the context of the project, it is necessary to implement an effective system of supervision over the contractual obligations with effective enforcement mechanisms, including a system of penalties and organization of conditions to remedy the consequences (for example, hiring a third party to the deduct from the contract cost for performance). It is recommended to give the Project Management Consultant powers and competences, which are in the countries with the best practices, would be managed by public bodies. At the same time, environmental protection authorities should be aware of all project activities and included them in training and capacity building programs.

5 ENVIRONMENTAL AND SOCIAL BASELINE DATA

5.1 Road Section in Karaganda Oblast

5.1.1 General Description

The Karaganda – Balkhash and Burylbaital section runs along the existing alignment Almaty- Astana M-36 road and goes through Abay, Buhar - Zhyrau, Shet and Aktogay rayons. The length of this section is 513 km. Location of the section is shown in the Map 2.3.1.

Karaganda region is located in the central part of Kazakhstan and the Eurasian continent. It is almost equidistant from the Arctic, Indian, Atlantic and Pacific Oceans. The climate is sharply continental and droughty. In the Oblasts there are 9 rayons, 11 cities, 9 of which are of national importance and regional subordination, 11 urban-type settlements, 422 villages. The existing highway M36 which will be widened under the project Centre-South Road Corridor section runs along the village Novostroyka in Bukhar-Zhyrau rayon through the villages Kurminka, Jumabek, Spassk in Abay rayon, along the villages Shopa, Nurataldy, Akshatau and through the village Aksu-Ayuly in Shet district through the Balkhash city village Saryshagan in Aktogay rayon of Karaganda oblast.

The region occupies the highest part of the Kazakh Hummocks – Saryarka which is unique, heterogenic in geomorphic sense, high-hills territory (absolute altitude 400-1000 meters). The landscape has river valleys, dry washes, hollows, inland cavities, lake basins, etc. The highest mountain groups are Karkaraly, Kent, Kyzylaray, Keshubay, Kyzyltas, Ulytau.

5.1.2 Climate

Climatic zones along the section of road in Karaganda oblast are presented by steppe, desert and semi-desert landscape zones of the temperate zone.

The territory of the Bukhar-Zhyrau rayon is included in the steppe landscape zone. The steppe zone is characterized by a dry sharply continental climate: the summer is hot and dry, winter with little snow, but harsh with winds and snowstorms. Evaporation in summer period exceeds atmospheric precipitation more than 3-7 times. Sharply continental climate is determined by harsh winter, high summer temperatures, high annual and daily amplitudes of air temperature and low number of precipitation. Despite the variety of natural zones that exist in the region, winter periods are quite long, cold and snowy. The average temperature in January is -14 to -16 degrees.

The snow cover throughout the rayon varies, for the most part produced in the early days of November and can reach 25-45 cm. Unstable weather patterns is observed during the entire period. Short thaws may be replaced by lengthy periods of frost. Severe snowstorms, fog and black ice conditions also are an integral part of the cold period. Spring is late, the average temperature of the air warms up to + 20 to + 25 degrees and during the night there are severe frosts, form a strong frozen crust.

There might be precipitation in the form of snow and wet snow. Strong wind and overcast weather is replaced by relatively warm and sunny days. Active snow melting and heavy rainfall cause a sharp rise of water in the rivers region, which can often lead to flooding of settlements.

Summer is usually warm, in some extended periods of hot and dry. Average thermometer readings in July are +23 to + 25 ° C. Short rains and thunderstorms mostly are local showers. Autumn is brief; predominate of wind and overcast days. During the year up to 275 mm of rain falls on the territory of region.

Abay region's territory is located in semi-desert landscape zone. Accordingly, the climate is continental, which was caused by a large remoteness of areas from the oceans. Winter place against the backdrop of slightly overcast and frosty days. The average temperature in January is -16 to -18 degrees. Snow cover is formed in mid-November. In winter, there may be brief thaws, weather is extremely unstable. Spring is late. The weather in this period may present various surprises in the form of unexpected snowfall, strong winds or heavy rain. Summer, adheres to calendar values, warm, and even in some periods roast. July temperatures reach an average of 16 + to + 20 degrees. The bulk of the rainfall occurs in July and August. According to the weather forecast for this period a large number of short-term torrential rains and thunderstorms are observed. Autumn brings wind and mostly cloudy weather. During the year rain falls up to 350 mm on the territory of region. Much of the precipitation falls in warm period.

The desert landscape area includes the territory of Shet and Aktogay rayons. The climate throughout the Shet and Aktogay rayons is sharply continental. Large fluctuations in daily temperatures are observed all over the year. Winters are short and moderately frosty and snowy. The average temperature in January is -9 ... -11 degrees. At night the temperature can drop to -25 to -27 degrees. Snow cover is uncertain and in some years cannot be formed. Frequent thaws and strong winds accompany the entire cold period. The summer period is long, accompanied by a large number of sunny and clear days. The average temperature in July is + 24 to + 26 degrees. At night, the air can cool down to + 13 to + 15 degrees and in the daytime temperature rises up to +40 degrees or higher. It is a limited amount of rainfall leads to the formation of strong dust and sandstorms. During the year rain falls can be up to 200 mm on the territory of region.

5.1.3 Geomorphology and Geology

The area of the alignment is characterized by its complex geological structure. There are common rocks of all geological ages from Paleozoic to Quaternary sediments. Because of the variety of sediment dominant role belongs to sedimentary and eruptive complex, much less developed intrusive and ancient metamorphic formations.

The river valleys and lake basin in the region of road reconstruction are composed of thick layers of alluvial and alluvial-proluvial quaternary sediments. Power of sand and gravel-pebble deposits Sarysu modern river valleys, Nura, Taldy, Tokrau, Mointy other reaches 15-20 m and more. In addition, in the valleys of the rivers boreholes opened the ancient alluvium, buried under 50-70-meter layer of tertiary clays. Ancient alluvium is represented by sandy-pebble deposits with a capacity of several tens of meters.

5.1.4 Soil, Sand and Soil-Forming Rocks

Karaganda – Balkhash and Burybaital Sections of the Corridor has complex soil conditions. Soil

characteristics and formation are affected by climate, hydrological conditions, geological structure, vegetation and other factors.

The most common types of soil in this area are dark brown and light brown soils, which occupy about 40% of the territory. In the northern and northeastern part dark brown soil is common while the central part is mostly covered by light brown soil. In southern upland and adjacent plains brown and gray-brown soils are developed, and in the mountain valleys - mountain black earth and mountain-chestnut soils.

The subzone of desert steppes on light-brown soils covers the Abay district of Karaganda oblast. The main zonal types of soils in Shet district vary from the relatively meager light brown soil with a low content of organic matter to dark brown - a relatively fertile, rich by structure and which can keep moisture.

Overburden rocks and rocks of productive strata do not have elevated radioactivity, rare and precious metals in the ground has not been found.

- sand, thin gravelly soil tight, light loam and sandy, characterized by increased infiltration. They are ubiquitous in sandy areas of southern and western regions;
- loamy soils of the southern and central areas of the region;
- heavy clay soils of the northern areas have the highest water-holding capacity.
- sometimes they are found in the south of the area along the river valleys, in lake basins on takyrs and other depressions.

Vegetative layer of soil is present along the road that according to the project decision will be removed for the use of soil. Capacity of the vegetative layer was 0.17 m, fertile layer was 0.23 m and on the slopes it was 0.20 m. The soil Map of Kazakhstan is shown in Figure 5.1.4.

Figure 5.1.4.Soil Map of Kazakhstan

5.1.5 Hydrological Characteristics

Kazakh hummocks cross many unnavigable rivers. Major rivers – Ishym (basin of the Obi) Silety, Shiderty, Tokyrau. They feed mainly by spring snowmelt, partly groundwater. The flood time they come out of its banks and poured floodplain. In summer months, the river become shallow, turning into river rich and dead arm of river, often the riverbed becomes dry. Continuous flow is observed only on the Ishim. To provide fresh water in the region it was built the channel Irtysh-Karaganda. In hummocky topography there are many salt lakes. Freshwater lakes are located mainly in the area of Kokchetau Upland - Borovoye, Shuchye, Large Chebachye, Imantau and others.

Nura River has about twenty major tributaries of the 1 order, for which water regime can be divided into permanent and intermittent at low water.

Such rivers as Akbastau, Baygozha, Kokpekty, Tuzdy, Shiderty, Ulken-Kundyzdy are related to permanent watercourses.

Valley of the river Akbastau associated with mountainous areas and it is their submontane trough. The width of the valley, on average 1-1.5 km, the same as rivers Baygozha, Akbastau begin on the northern slope of the watershed and flows almost in a straight line in the meridional direction. Average long-term costs of the two rivers are 0.18 and 0.57 cubic meters m/s, respectively, and runoff modules from one square kilometer of the surface of the pool are 0.40 and 0.57 l/s.

Fresh river water with mineralization up to 1 g/l with chloride, or sodium bicarbonate-chloride compound.

Rivers Sherubay-Nur, Zharly, Ashisu, Otkelsyz, Kokpekty, Tuzdy, Oshagandy are become dry in the summer. During floods these rivers are dropping up to 75-100% volumes of annual runoff. Rivers Tuzdy and Kokpekty are seasonal, it is practically absence the drought flow in the seasonal flood the average consumption of water is 0.3 cu. m/s. In the spring seasonal flood at the river Kokpekty the annual runoff is up to 100%.

The rivers are fed by underground sources. Salt-tertiary clay, which is found here, leads to an increase in salinity. Small rivers, being the main supplier of major rivers are protected to a lesser extent. Compared with large and medium rivers, of the practical use, to them pay insufficient importance. However, all total river flow belongs to all these rivers (60.4 billion. Cu. M), formed on the territory of the republic.

Along the road the alignment crosses small left-bank tributaries of the Sherubay- Nura, flowing from left to right, upper sections of the small rivers in Karaganda and Karabidayik flowing in the opposite direction.

The hydrological regime of rivers and temporary streams of the area is determined by the conditions of their nourishment. In accordance with the exceptional value of the melted snow in the nourishment of the water streams of the considered territory the main stage of its regime is sharply expressed spring seasonal flood, followed by a deep low water level up to complete drying of small streams and often relatively large rivers.

Surface water

Balkhash-Alakol and Irtysh river basins in the east and in the north-east are almost 75% of surface water sources in the country. Balkhash-Alakol basin occupies a vast area in the south-eastern Kazakhstan, part of China and a small part of Kyrgyzstan. Its area - 413 000 km2, including 353,000 km2 in Kazakhstan (Almaty and Zhambyl and Karaganda oblasts and oblasts of East Kazakhstan). Permanent rivers flowing into lake Balkhash - Ili, Karatal, Aksu, Lepsy, Ayaguz - occur in the mountain areas of Tyan-Shan, and Tarbagatay Dzhengis Tau. Ili River flows into the western Balkhash, while other rivers flow into the East Balkhash.

The territory of the basin of the lake Balkhash is characterized by its great diversity and complexity of the geological structure. The hydrographic network of the district is represented by Bidaiyk river with many tributaries. The absolute level of the surface within the boundaries of the projected area is up to 673.72 - 768.70 m.

The oblast is drained by rivers: Sarysu, Nura, Turgay, Uly-Zhilanshik, Tokrau, Kalmakkyrgan (Beleuty) and others closed basin of lakes of Central Kazakhstan, the southern part of the region belongs to the basin of lake Balkhash (Northern Balkhash).

The use of water from surface water and groundwater within the construction of roads is permitted only with the permission of the Committee for Water Resources under the Ministry of Agriculture of the RK. According to the working design of the road section km 1666- km 1713 water for industrial purposes will be used from the lake, located next to Highway Karkaralinsk - Aksu Ayuly. Distance from the lake to the begining of the project territory is 73 km. Distance from the lake to the highway Karkaralinsk - Ayuly Aksu is 6 km away from the road. Distance from Karkaraly - Aksu Ayuly to Karaganda - Balkhash is 6 km away. Other sources of water for construction purposes will be determined after completion of the design of the rest 12 sections and obtaining permissions for

special water use from the Committee for Water Resources under the Ministry of Agriculture of the RK.

Ground Water

Groundwater along the section km 1666- km 1713 of the project alignment of the area is taken off from down holes 1, 28, 35, 55, 56, 57, 62, 74, 75, 84, 149 and 150 in the areas of temporary streams, and belongs to perched groundwater. Set level of groundwater during the survey, was noted at the depths 1,30- 5,60 meters from the ground. Groundwater is nourished due to precipitation.

The chemical composition of chloride - sulphate - sodium, chloride - sodium and sulfate - chloride - calcium - sodium, with a dry residue of 1828 - 4478 mg/l. Reaction of alkaline water (pH = 7.0 - 7.2).

Groundwater have a weak adverse impact of carbonic acid on the concrete W4-W6 - on Portland cement, mild to moderate degrees of aggressiveness to the installation of reinforced concrete constructions with periodic moisture. Data on groundwater for the rest of the project sections will be known after completion of project works.

5.1.6 Flora and Fauna

The methodology of biodiversity study along the alignment

Biodiversity along the alignment was studied using available information sources. Also, flora and fauna along the alignment was studied during the field studies conducted by the representatives of PMC "KazdorNII" JSC and "KazCEP" LLP. It was not discovered that the section of road in the Karaganda region passes through the protected areas. During the public hearing in June 2015 there were discussed potential problems with wild animals on the sections who can be hit by motorists while crossing the road.

The vegetation-flora

In the result of literature studies and field inspection in the regions of road alignment it is revealed that due to the dry climate with high heat supply the main feature of the vegetation is alike the vegetation in desert areas. Vegetation is presented by half-shrubs and bushes, which are characterized by low gross diversity, low cover and the absolute dominance of drought-resistant species of xerophytes and hyper xerophytes. Vegetation in these areas steppe sections are significantly transformed due to over grazing.

During the preliminary literature studies and field inspection, no vegetation was found along the road pass way that is listed in the Red Book. Vegetation found in the regions of road pass way is described below.

Vegetation in Bukhar-Zhyrau district is represented by fescue-stipa psammofit-sod-grass, fescue-feather grass, fescue-stipa and psammofit-forbs-feather grass types. The grass cover is thinned; general projective cover is about 50-60%. It is widespread fescue-feather grass (Stipa lessingiana) steppes, which are characterized by a small admixture of grasses. The main zonal types are xerophytic-forbs-fescue-lessingiana (Stipa lessingiana), Festuca valesiaca, Galatella divaricata, Galatella tatarica, Phlomoides agraria, Tanacethum achilleifolium) as the south option of dry steppes.

In the Abay region of Karaganda Oblast in the subzone of desert steppes it isdistinguished worm-wood- stipa. It should be noted that with the comparison with dry steppes in the subzone of desert steppes it is significantly increase the complexity of vegetation.

Main edificatory of communities of desert steppes are Stipa lessingiana S. sareptana and Festuca valesiaca. As a co-edificator acts euxerophilous shrubs Artemisia gracilescens, A. sublessingiana. Group of forbs is small and includes typically xerophilous species. The characteristic species are leban Kochia prostrata and short vegetative plants - gemiefemeroidy types p. Ferula, ephemerids types p. Tulipa, Gagea and ephemera.

Peculiar and very rich floristic vegetation is in Shet district by means of territory stretching in rather latitudinal bands of vegetation. For this region, the vegetation is typical carane-cold-wormwood-stipa (Stipa capiilata, Artemisia frigid, Caragana pumila,Cleistogenes sqarrosa, Potentilia acaulis), fescue-term and psammophyte sod-grass (Stipa capilata, Festuca valesiaca, Artemisia marhchalli-ana, Gypsophila panlculata), grass sod (Stipa capilata, S.lessingiana, Festuca valesiaca) in complex with Artemisia schrenkiana (Artemisia schrenkiana) and Artemisia pausiflora (Artemisia pausiflora) types, and areas near water bodies is traced sections of shrubs, halophytic meadows and reed beds, the representatives are Tamarix ramosissima, Halimodendron halodendron, Puccinelllia distans, Hordeum brevisubulatum, Juncus gerardii, J.compressus Limonium gmelinii, grasslands combined with marsh- tuber bulrush reeds Eleocharis, Phragmites australis, Bolboschoenus maritimus grassy marshes and perennial halophytic in complex with black wormwood Limonium suffruticosum, Atriplex cana,Halimione verrucifera, Artemisia pauciflora.

Section of the route through Aktogay region covers plant plain zoning types: complex wormwood Artemisia semiarida, Stipa sapertana, S.kirggisorum black dormouse Salsola arbusculiformis, Ar-temisia semiarida, Stipa Sapertana, S. Kirghisorum and tasbiyurguns Nanophyton erinaceum. This zoning is replaced by complex grass-black dormouse Salsola arbuscula, Artemisia terrae-albae, Sti-pa Sapertana, S.richteriana with Ferula ferulaeoides and tasbiyurguns Nanophyton erinaceum, which are located along the upper west coast of lake Balkhash. In some places there are turan sage-brush- and white earth sagebrush-black dormouse Salsola arbusculiformis, Artemisia terrae-albae, A. turanica, Ferula ferulaeoides, Ephedra distachia, E. Intermedia, Nanophyton erinaceum, Anaba-sis fruncata, Rhammatophyllum frutex.

Fauna

Region of the project for a long time was under the influence of multi-component human impact. Ways of seasonal migrations and recreation of birds and mammals in the project area is not marked. Mainly small rodents, reptiles, birds and insects represent the fauna of the designed area. According to preliminary literature studies and field inspection in the area of road construction no endangered species of animals were found that are listed in the Red Book of RoK. The region is characterized by the abundance of domestic animals, well adapted for life and reproduction, stress-tolerant spe-cies.

The region of road alignment pass way is inhabited by the following species: saiga, wolf, wild boar, fox, korsak, gopher sandstone (zurman), groundhog, polecat, rabbit, goose, ducks.

In the zone of the road construction there maybe the following representatives of animal world:

- class of reptiles: sand lizard, agama, grass snake, adder, colorful lizard, copperhead;
- class mammals from rodents: field mouse, vole, mouse, gopher, jerboa, hedgehog-eared;
- class of amphibians: toad, moor frog;

- class insect phalanx, mosquito, fly, lacewing, a dragonfly;
- class of birds: Spanish sparrow, bird, crow, raven gray, starling, wagtail, roller, European bee-eater.

Impacts on terrestrial fauna and flora

i. Impacts on terrestrial fauna. As, the project area does not contain forest, there is no forest as habitat for wild animals. In some parts of the project, footprint there are scattered acacia trees. The irrigation development will not affect areas of wildlife habitats, and not disrupt habitat use patterns of the wild animals.

ii. Impacts on terrestrial flora. The project activities that will affect the vegetation and the terrestrial habitats will include land clearing and leveling, building access roads and establishment of site facilities. When the project is, implemented, there would be a consequent change in the natural vegetation of the area.

The following list includes all mammals, which occur in Kazakhstan and rated as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU) in the 2004 IUCN Red List of Threatened Animals.

- **Endangered:**
  - Desert Dormouse (*Selevinia betpakdalaensis*). (Endemic to Kazakhstan.)
  - European Mink (*Mustela lutreola*).
  - Snow Leopard (*Uncia uncia*).
  - Tiger (*Panthera tigris*).
- **Vulnerable**:
  - Argali (*Ovis ammon*).
  - Asiatic Wild Ass (*Equus hemionus*).
  - Caspian Seal (*Phoca caspica*).
  - Dhole (*Cuon alpinus*).
  - Eurasian Otter (*Lutra lutra*).
  - Five-toed Pygmy Jerboa (*Cardiocranius paradoxus*).
  - Geoffroy's Bat (*Myotis emarginatus*).
  - Giant Mole Rat (*Spalax giganteus*).
  - Lesser Horseshoe Bat (*Rhinolophus hipposideros*).
  - Mediterranean Horseshoe Bat (*Rhinolophus euryale*).
  - Menzbier's Marmot (*Marmota menzbieri*).
  - Pond Bat (*Myotis dasycneme*).
  - Russian Desman (*Desmana moschata*).
  - Steppe Pika (*Ochotona pusilla*).
  - Thick-tailed Pygmy Jerboa **(*Salpingotus crassicauda*).**
- **Other**:
  - Saiga (*Saiga tatarica*) (Rated Vulnerable in the 1996 Red List; rated Lower Risk: Conservation Dependent in the 2000 Red List.

5.1.7 Land Resources

Section of the road M36 beginning from Balkhash 1853 km to Burylbaital village 2152 km passes on arable land, but during the pre-inspection of the road section the representatives of "KazCEP"

LLP the irrigation systems have not been found.

The total area of land owned by the state, which will be acquired for permanent use in Karaganda oblast, will be determined after the completion of the detailed design and preparation of the list of affected people and will be described in the project on land acquisition and in Resettlement Action Plan (RAP).

Additional land will be required for borrow pits during quarrying of the construction materials, as well as for temporary entrance to the construction site for the warehouse building, workshops and housing for workers. In addition to them, additional land acquisition is required for the storage of constructional materials and for development of borrow pits and borrow pits for road - construction materials.

Contractors will obtain access to all land required for temporary use solely through negotiation with the owner or user;

In accordance with the requirements of Land Code of the RK it is necessary to ensure that all land used temporary for construction are returned to their original condition through a reclamation program.

5.1.8 Physical Cultural Resources

Archaeological examination conducted in accordance with the applicable laws of RoK along the road section located on the territory of Karaganda region. Archaeological examination was conducted by qualified archeologist. Examination was carried in accordance with the methodology of the archaeological examinations by the preliminary work with archival and bibliographic data, analyzing images from the space.

In the course of the examination all objects of historical and cultural value have been recorded (hereinafter the "Monuments") within the area of expertise (200 m to the right and 200 m to the left from the axis of the road).

The study identified 12 *HCH* facilities in the area of road alignment (see Table 5.1.8 below).

Exact conclusion regarding availability/absence of Historical and cultural objects in the area of road alignment can be given only upon receiving results of archeological examination and field inspection.

Analysis of sources shows that archeological objects of different ages, from Stone Age to modern age, are common for the territory of road alignment.

Table 5.1.8.1 HCH revealed in the area of construction of "Karaganda – Burylbaital" road

№	The name of the object*	Geographical coordinates (WGS 1984 UTM 43 T zone)	Object description

1	Kuigenzhar burial ground	42 U 690337 5664759	Kuigenzhar burial ground consists from 5 burial mounds, 2 of which were investigated in 2003
2	Kyzyl-zhar burial ground	42 U 690251 5664600	Kyzyl-zhar burial ground. Visually is not fixed at the surface. It was opened in 2001 during construction works. Two iternments were investigated. It is dated by the bronze age.
3	Karboz Mausoleum	E 496745 N 4919096	Karboz mausoleum (at topographic map it is marked as Sorali tomb) is located at hummock and it is the remaining of collapsed cone-shaped structure, with round shape in plan view, from adobe brick of standard: 35 x 15 x 10 cm. Rubble is collapsed remainings of mausoleum with the height of 1.3 m and diameter of 10 m. Muasoleum with the diameter of 5 m, the remaining height of walls is 3.5 m. Trangle entrance is located in south-western wall of mausoleum. Its height is 0.8 m, thickness of walls at entry is 1.4 m. Modern commemorative stele with zoomorphic roff-shaped cover is installed in front of mausoleum. To the North of mausoleum the pits for adobe brick mixing are noted.
4	Burial mounds	E 496900 N 4918328, E 496900 N 4918328	Burial mound consists of two burial grounds located at the hill. Burial ground 1 is stone-earth embankment of round shape with the diameter of 15 m and height of 0.7 m. Burial ground 2 is stone-earth embankment of roundish shape with the diameter of 13 m and height of 0.6 m. The monument is dated by early iron age.
5	Burial ground	E 494647 N 4919399, E 494652 N 4919387	Burial ground consists of two burial grounds located at slight hilly surface. During communication cable laying through the territory of monument the burial ground 2 was destroyed. Burial ground 1 is stone and earth embankment of ellipse shape with the size from North to South – 12 m and from West to East – 10 m. The height of burial ground is 0.7 m. Burial ground 2 is amorphous rockfill, the remaining of destroyed burial ground. The monument is dated by the early iron age.
6	Single burial ground	E 488801 N 4921515	Single burial ground is located at hummock. The monument is stone-earth embankment of stretched semi-spherical shape. The diameter of the burial ground is 11 m, height is 0.4 m. The monument is dated by early iron age.
7	Single burial ground	43 T562936.84 4892888.79	The embankment of burial ground is stretched semi-spherical shape, round in plan, composes from earth and stone, it is rotten grass-covered. The diameter is 13 m, height is 0.3 m. At the exterior edge of embankment bottom there is a trench with the width 0.8 m and depth up to 0.2 m.
8	Burial Mound	43 T564370.19	It consists of five burial grounds along SW-NE. Embankment is well-made of earth and stone of stretched

		4891853.56	semi-spherical shape, round in plan. The diameter of embankment is from 11 to 15 m, height is from 0.1 to 0.3 m.
9	Burial Maykuduk	N 49°54.089′ E 73°13.432′	Consists from 3 burials. It has stone – ground embankment. Diameter of embankment from 26 to 29 m. height from 0.8 to 1 m. The monument is preliminary dated for the period for EIA (Early Iron Age). The radius of the protected zone is 100meters from the outer boundaries of the monument.
10	Burial group of Ushtobe	N 49°48.151′ E 73°15.963′	Burial group consists of three mounds. It has a stone-ground embankment. The diameter of the embankment from 5 to6m, height from 0.2 to0.3 m. The monument is preliminary dated for the period for EIA (Early Iron Age). The radius of the protected zone is 100meters from the outer boundaries of the monument.
11	Burail Sokur	N 49°41.517′ E 73°12.167′	Burial has the ground embankment. The diameter of the embankment15m, height0.5m. at the distance of 10 m to the southwest of the burial it is an altar. Diameter 1m, height 0.2 m. The monument is preliminary dated for the period for EIA (Early Iron Age). The radius of the protected zone is 100meters from the outer boundaries of the monument.

The precise archaeological report is presented in Appendix 2 of this report.

5.1.9 Social and Economic Characteristics of the Section

Karaganda Oblast is located in the central part of Kazakhstan and the Eurasian continent. It is almost equidistant from the Arctic, Indian, Atlantic and Pacific Oceans. The climate is extremely continental and droughty. The region occupies the highest part of the Kazakh Hummocks – Saryarka. The region borders with Akmola Oblast in the north, Pavlodar Oblast in the north-east, East Kazakhstan Oblast in the east, Almaty Oblast in the south-west, Zhambyl Oblast, South Kazakhstan Oblast and Kyzylorda Oblast in the south, Aktobe Oblast in the west and Kostanay Oblast in the north-west.

Currently, Karaganda Oblast is the biggest in terms of the territory and industrial potential. It is rich in minerals and raw materials. The territory of the region makes 428 thousand sq km (15.7% of the territory of Kazakhstan). The tenth part of the country's population lives in the region. According to statistical data the population of Karaganda Oblast as of 1 April 2015 made 1 mln. 379 thous. 747 people.

The road passes through mainly rural area with low population density. Since the major part of route passes through open space, the population level living close to the road is very low. The average population density in the region is 3.1 people per one sq km.

Natural Resources

Karaganda Oblast is a unique, rich with mineral resources region of Kazakhstan. 100% of the reserves of manganese, 36% of copper, 80% of wolframite, 64% of molybdenum, 54% of lead, over 40% of coal including 100% of reserves of surveyed coal resources are concentrated in the region. The soil of the region is also rich in rare and rare-earth metals: bismuth, silver, antimony, titanium, nickel, cobalt, aluminum oxide, arsenic, blunt, etc. The region has essential deposits of ironstone and polymetallic ore.

The region also has essential raw hydrocarbon deposits. The Karaganda coal basin Konyrat is one of the most gas-bearing among the CIS basins.

The deposits of methane are assessed to be potentially significant. Three oil and gas deposits were opened in the south-west of the region – Kumkol, South Kumkol and Maibulak. The explored reserves of oil makes 180 mln tons; gas – 13 bln cubic meters, gas condensate – 35 thousand tons. Kumkol deposit is developed. Maibulak field was prepared for development. South Kumkol is under preparation. Deposits of rhodusite-asbestos Kumola and Ushbulak are the only one in the CIS. They are located in the western part of the region. The biggest deposits of wollastonite Bosaga and Alaigyr are located in the central and southern parts.

Regional Economy

Power and fuel energy, iron industry, engineering, chemical industry are among the basic sectors of the economy.

Administrative Subdivision

There are 9 districts, 11 towns, 9 of which are of state importance and regional submission, 11 settlements of town and 422 villages. There are 11 towns in the region – Abai, Balkhash, Zhezkazgan, Karaganda, Karachal, Karkaralinsk, Priozersk Saran, Satpayev, Temirtau, and Shakhtinsk. The existing highway M36 which will be widened in the framework of Center – South Road Corridor Project will pass through the Novostroika village in Bukhar-Zhyrau district, through villages of Kurminsk, Zhumabek, Spassk in Abai district, along the villages of Shopa, Nurataldy, Akshatau and through the Aksu-Ayuly village in Shet district, through Balkhash town and Saryshagan village in Aktogai district of Karaganda region. The information on these districts is provided in Appendix 6.

5.2 Road Section in Zhambyl Oblast

5.2.1 General Description

Zhambyl Oblast is an administrative and territorial unit located in the South of Kazakhstan. Its regional center is Taraz. The population of the region is 1,000,000; the city population is 335,100. The region borders with Kyrgyzstan, and is located very near to Uzbekistan (all to the south). Zhambyl Oblast also borders three other regions: Karagandy Oblast (to the north), South Kazakhstan Oblast (to the west) and Almaty Oblast (to the east). The total area is 144,200 square kilometers (55,700 sq m). The region borders Lake Balkhash to its northeast.

147 km out of 660 km of Center – South Road Corridor section: Karaganda – Balkhash – Burylbaital entirely passes through Moyinkum district of Zhambyl Oblast. Moyinkum village is an administrative center of it.

The road passes though Kashkan Teniz village (1 km from the road), Mynaral village (7 km from the road), Ulken village (belongs to Almaty oblast and located in 9 km from the road), Shyganak village (1 km from the road), Burylbaital village (0,5 km from the road) of Moyinkum district.

The area of the district is 50.4 thousand km² and this is the largest district of territory in the region.

5.2.2 Climatic Characteristics

Zhambyl region is located in the South of Kazakhstan. The road passes through Moyinkum district of Zhambyl region. Throughout the territory, there is a long and hot summer with large amount of sand-storms. Average temperature in July reaches +31…+32 ° C. The temperature in noontime in shadow can reach to +40…+44 ° C. Although winter times are not long but it is cold. The average temperature in January is -2…-4 ° C, in night time the temperature may drop to – 20 ° C. The snow cover is unstable. The main part of annual precipitation is in spring time, the remaining part of precipitations is distributed to late autumn and winter. There are almost no precipitations in summer time. Overall up to 100 mm precipitations fall per year.

5.2.3 Geological Characteristics, Relief

The territory of Moiynkum district stretches from the vast desert Betpak-dala to beautiful Tien Shan and from Chui valley to Karatau Mountains. Karatau mountain range is in the north-western part of the Tien Shan, in the south of Kazakhstan. It extends in the area of Talas Alatau and gradually decreases moving into Sarychuysk plain. The length of the mountain is 420 km. The mountain range is divided into the eastern part or into the Small Karatau and southwest Karatau. The highest point - the peak Bessaz, height is 2176 m.

5.2.4 Hydrological Characteristics

Although rainfall is comparatively low the Zhambyl region is fairly rich in water resources due to the proximity of the mountains, where precipitation is higher and snow-melt and glaciers provides a perennial runoff. The region territory is drained by a number of large rivers and lakes which flow into the internally closed (Endorheic) Balkhash Alakul Basin. The most significant waterway is the Ili River.

Surface Water

There are two rivers Ushbalyk and Shyganak along the road section shown below with dry riverbed. In this district there is little rain, high evaporation of moisture from the river, resulting in drying it. The drying up of rivers Ushbalyk and Shyganak occurs during the summer-autumn low water - the low state of the water level in the river (the flow of water from the river basin is sharply reduced, and rivers go mainly on underground). Low water occurs in the third decade of May - mid-June, ending in September - October, most low-water is in August and September. Clearly traced dependence terms of establishing a minimum level in the rivers of moisture areas: less rain falls, the earlier set of low water. These rivers, which have a length of less than 10 km, goes in depth only in the spring, with the onset of summer low water (this is especially characteristic for the rivers of the steppe zone). For major waterways of Lake Balkhash, which are located near the river of the cessation of summer runoff is unusual, but in drought years they become shallow, especially in the areas

below the dam. Termination of flow in such cases occurs due to the intensive water filtration through the rocks on the watersheds and river channels. Sometimes the drying continues throughout the winter until the spring of next year.

Figure 5.2.4 Dry bed of the rivers Ushbalykand and Shyganak

Moreover, the ecosystem of these rivers began to change under the influence of human activity about 1000 years ago. Despite technological interference, high population and widespread agriculture in the 10-13 centuries AD, the water level of rivers and their general condition, mainly dependent on natural conditions. However, over the last 50 years, the stability of the rivers was deeply disturbed by inefficient use of water.

About 250 km of the Karaganda-Balkhash and Burylbaital road of Center-South Corridor runs along the shoreline of Lake Balkhash. In this regard, the details of the current state of Lake Balkhash are provided. Balkhash Lake is one of the largest lakes in Asia and 13th in the list of the largest inland lakes in the world. It is located in the south-east of Kazakhstan, in Central Asia, and refers to the zero-discharge (closed) basin, shared by Kazakhstan and China, and a small part in Kyrgyzstan. Basin flows into the lake through the seven rivers. The largest is the Ili River, which brings most of the coastal influx; others, such as the Karatal provide both surface and underground drainage. The river is fed by rainfall (mostly by fresh meltwater) from the mountains of China Xinjiang region.

Lake Balkhash currently covers 16,400 km2 (6,300 sq. m), but, like the Aral Sea it is shrinking because of the water diversion of the rivers that feed it. Lake is divided into two different parts by strait. The western part is fresh water, while the eastern half is saline. The eastern part in average is deeper to 1.7 times than the western part.

Ground Water

The Design works at the road section passing through Zhambyl region are going on and data groundwater sources will be known after the completion of design works under remaining 12 road sections.

5.2.5 Soil and Soil-Forming Rocks

The soil cover of the region is diverse. Among the zonal soil types (dark brown, light-brown, brown and gray-brown), are replaced sequentially from north to south, are ubiquitous in trigonal soil (salt licks, salt marshes, meadow-chestnut, meadow, meadow brown, meadow, meadow-bog, takyr). Their formation is associated with the local conditions of soil formation.

The most common types of soil in this region are dark brown and light brown, which covers about 40% of the territory.

Relief of Turgay plateau and Turan lowland is lined, vast undulating, steeply sloping, undulating spaces alternate with extended (wicked in the south and lacustrine in the north) slides, sometimes cut by river valleys. The relative excesses generally do not exceed 50-60 m. On the flat watershed suffusion-sagging phenomenon are widespread. On the banks of rivers and in lake-like lows, the processes of erosion and in the northern part the flushing are observed. In the southern part Turgai plateau is separated from Turgai hollow by chink - steep eroded slopes in some places reaching 100-140 m in height.

According to the natural and agricultural zoning of the land fund of Kazakhstan the territory of this section includes the following natural zones and their corresponding natural agricultural provinces and districts:

- dry steppe zone, including Zauralsky, North- Turgay and Mid-Turgay district of Central Kazakhstan province with chestnut soils;
- semi-desert zone, which includes the South Turgai district of Central Kazakhstan province with light chestnut soil;
- desert area, including Aral Sea region district of Aral-Balkhash province with brown soils.

5.2.6 Flora and Fauna

Flora

The proposed route is located in the desert steppe zone of irrigated and unwatered agriculture, as well as sheep and cattle breeding. Vegetation on the gray soils consists mainly of wormwood. Much of the vegetation is represented as a mayfly species: meadow grass, brome grass, small Carex, poppy.

The road section in the Zhambyl region largely represented by types of wormwood vegetation type in the form of wormwood Artemisia sublessingiana, A. terrae-albae, shrubs Krascheninnikowia ceratoides, Ephedra, Salsola arbusculiformis. The soils along the M 36 highway of Moyinkum district dominated by sagebrush saltwort and wormwood-grass vegetation: wormwood, feather grass, reeds, waltwort, branchy and other plants.

On the shores of the lake grows Asiatic poplar and willow from graminales - common reed grass (Phragmites australis), reed mace (Typha angustata) and several types of reeds – coastal (Schoenoplectus littoralis), lake (S. lacustris) and endemic specie of reed Kazakhstan (S. kasachstanicus).

The variety of species in the vicinity of the existing road, which is planned to widen, was significantly affected by agriculture and farming on the road section from Balkhash city to the of Burylbaytal village.

Fauna

A small section of road in Zhambyl Oblast, Moiynkum District runs along the section with regular regime of Zhusandaly State Protected Zone of the National Values (SPZNV). Regulated regime of the protected zone is stipulated the limited use of natural complexes, as well as maintenance of land plots by land owners and land users of traditional economic activities, techniques and methods, without adverse effects on the natural complexes and objects and the objects of the state natural reserve fund. Zhusandaly SPZNV occupies a very large area (2.757 million hectares).

The following mammals are for the area of alignment: gazelle, wolf, jackal, fox, corsak, hare. The avifauna includes 200 species, including 83 species of nesting and more than 100 migratory.

In the area of the alignment in connection with economic activities and the functioning of the existing road there are not observed high biodiversity and seasonal migrations of animals.

5.2.7 Land Resources

Zhambyl Oblast passes through some irrigated land near the villages. But during the road inspection there were not observed irrigation systems.

Some land will be taken under the permanent use for the road construction, access roads and junctions, including arable land with a small amount of commercial and industrial buildings. Land acquisition will be done after the completion of the detailed design, and full description will be provided in the RAP on the implementation of resettlement activities. At all sections there are sites that should be acquired for construction needs. Land acquisition for the construction and reconstruction of the road will be made at the stage of survey work with participation of territorial land inspections of the Committee for Construction, housing and communal services and land administration departments of the Republic of Kazakhstan and the department of the local ecology of the Committee for Environmental regulation, control and state inspection in the oil and gas complex.

Resettlement Action Plan (RAP) will be prepared upon the completion of the detailed design and preparation of the affected person and land list.

5.2.8 Physical Cultural Resources

Researches were done by the qualified archaeologist along the road section, which passes through the territory of Zhambyl Oblast. The result of the research is presented as Archeological Inspection Report and attached in the Appendix 2.

5.2.9 Social and Economic Characteristics of Moyinkum District in Zhambyl Oblast

Moyinkum District

The area of the district - 50.4 thousand km² and this is the largest area of territory in the region. Moyinkum district (in Kazakh language Мойынқұм Ауданы) - an administrative unit in Zhambyl region. The administrative center is Moyinkum village.

The rural population of the district - 26 077 people, the Akbakay village - 1163 people, the Aksuek village - 1564 people, Mirnyi village - 1824, Mynaral village – 687 people, Khantau village - 925, Shyganak village – 2312.

In the south-eastern border of the district Moyinkum district is Zhambyl rayon of Almaty oblast. The length of the border is 140 kilometers. The beginning the designed road has coordinates 45°59′38.8″N 73°34′22″E (end of the designed road in Aktogay district of Karaganda oblast and the beginning of the alignment in Moyinkum district of Zhambyl oblast).

At the entrance to the Moyinkum disctict there are main testing ground for Soviet anti-missile systems, which is similar to the objects in USA on the islands Kwajelein (Coordinates: 45°58'11"N 73°31'31"E).

Figure 5.2.9.1. At the entrance to the Moyinkum district there is main testing ground for Soviet anti-missile systems

Along the road there are railroad bed at the different distance, the nearest distance is 210 meters from the designed alignment. At coordinates 45°48′50.5″N 73°26′19.6″E and 45 ° 04'35.7 "N 73 ° 58'47.8" E the railroad bed crosses the designed alignment.

Figure 5.2.9.2. Place of crossing of the designed alignment and railroad bed.

Along the alignment at the distance of 150 meters from the pavement there is a cemetery (Coordinates: 45°49'42"N 73°26'52"E).

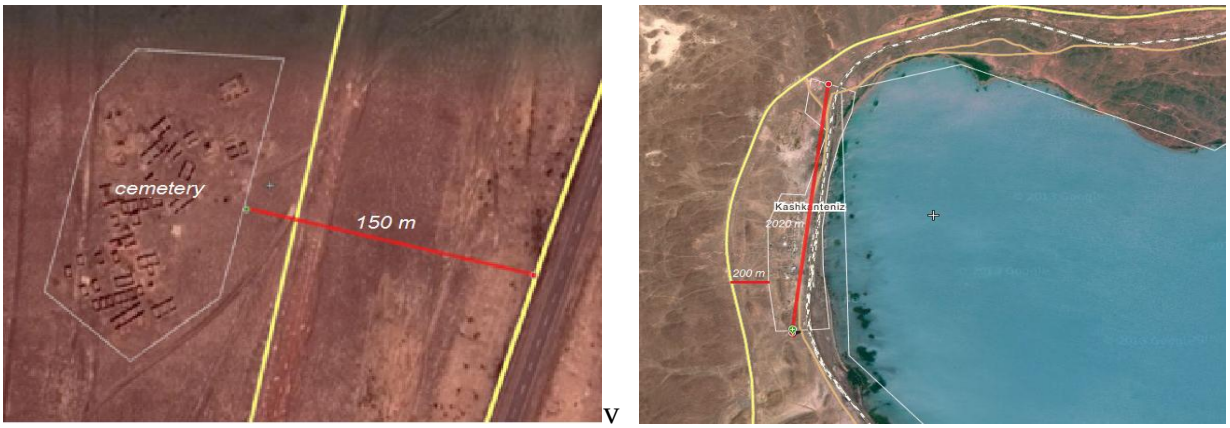


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Figure 5.2.9.3 Location of the cemetery along the designed alignment

Reference data with angular coordinates 45°48′46.8″N 73°24′21.7″E at the distance 25 meters from the road pavement there is a road service. Also along the all distance of the alignment from the boarders of the districts to the end coordinates of designed alignment there are about 50 points of service of small sale of fish products, bee products and livestock. The location coordinates will be presented in the Appendix 2 to the reporting documentation.

In the place with coordinates 45°47'59"N 73°23'51"E there is Kashkanteniz station (Figure 4) in Moyinkum district of Zhambyl oblast of Kazakhstan. Station is included to Mynaral rural district. It is located approximately 174 km to the north from the district center of Moyinkum village. According to the official census of 2009, in the rural district lived 190 people (99 men and 91 women)

Reference data with the coordinates 45°30'58"N 73°31'43"E at the distance 2 km from the road pavement, there is a borrow pit of the quarrying of the inert construction materials. The data about the owners will be specified further. Given resource with the presence of the necessary environmental protection and legal documentation, can be the potential supplier of the construction materials during the reconstruction of the designed alignment.

Figure 5.2.9.4 Mini-hotel "Pyramid"

Mynaral cement plant ("Zhambyl Cement Production Company" LLP) is located along the alignment. Mynaral cement plant - a joint venture company «Vicat Group», is the oldest leader of the production of cement in the European space. Director - Sargaskayev Aivar Sayatovich. The factory produces and sells Portland cement M400 D20 and M500D0. Mynaral plant uses advanced "dry" method of production of cement, which implies a considerable energy savings. In addition, around the world "dry" method in comparison with the "wet" method recognized as environmentally safer.

The coordinates: 45 ° 23'17 "N 73 ° 39'23" E.

Further along the alignment on the angular coordinates: 45°17'53"N 73°47'13"E, there is located bay "Ushbalyk". This place has a great popularity among the fishermen.

At the coordinates 45°17′10.4″N 73°46′27.7″E there is a border between Mayinkum district and Zhambyl oblast and Zhambyl district of Almaty Oblast.

Ulken village (Coordinates: 45°12'18"N 73°58'53"E) of the Zhambyl district of Almaty oblast, at the south-western part of the Balkhash lake, located to the close proximity to the Thermal Electric Power station Balkhash (Coordinates: 45°12'26"N 73°56'28"E). The village population according to the data of the latest census of 2009 is about 4000. Also at the distance of 450 meters from the highway there is cooling pound (Coordinates: 45°13'38"N 73°54'59"E, possession of the TEPS Balkhash).

Construction of the Balkhash combined heat and power station has been included in the list of 28 investment strategic projects. Input capacity of the Balkhash combined heat and power station allowed to eliminate the power deficit in southern Kazakhstan, oriented mainly on electricity mainly on gas and reduced fuel oil.

The approved cost of the project amounted to 530.9 billion tenge. Up to four thousand people have been involved in the construction of the station. Currently, station provides about 800 work places to Kazakhstan energy workers.

Balkhash combined heat and power station is built under the latest technology, with minimal emissions into the environment. Adopted technical solutions prevent from falling of effluent and waste into Lake Balkhash.

The project was implemented at the expense of private investments and borrowings. Plus 30% of the equity of stakeholders of "BTES"JSC.

South Korean corporations SAMSUNG and KEPCO, which won an open international tender for selection of strategic investment partner, took part in the construction of combined heat and power station.

There are also many points of petty trade in fishery products along the highway. There are tourist recreation camps along the Lake Balkhash.

There is roadside service with part time farm along the highway at the coordinate data of 45 ° 12'11.2 "N 73 ° 53'26.8" E.

At the point with coordinates 45 ° 07'03.2 "N 73 ° 57'53.3" E passes the boundary of Zhambyl district of Almaty region with Moyinkum district of Zhambyl region. In the immediate vicinity of the border there are several roadside services and farms, as well as the post of traffic police (Coordinates: 45 ° 7'15 "N 73 ° 57'52" E) and the Shyganak village (Coordinates: 45 ° 6'25 "N 73 ° 58 '24 "E) with a population of about 3,000 people. The socio-economic situation of the village is very poor due to lack of basic living conditions (lack of drinking water, lack of essential personnel: doctors, teachers, etc.).

Burylbaital village

The village in Zhambyl region of Moyinkum district is included in the rural administration of Shyganak. Geographical coordinates 44 ° 56'22.87 "74 ° 1'3.79". It is located along the M36 highway.

Baital is located at 400 meters from the village railway station.

The village population is 315 people (155 men and 160 women).

The village in Zhambyl region of Moyinkum district is included in the rural administration of Shyganak.

The geographical coordinates of the village are 45 ° 6'22.52 " 73 ° 58'26.29" It is located along the M36 highway, one kilometer from the Lake Balkhash. There is a railway station on the line Mointy - Chu. The village population is 2402 people (1179 men and 1223 women). The bulk of the inhabitants are Kazakhs and Russians. However, there are other nationalities like Chechens, Kurds, Ukrainians / Cossacks, Belarusians, Uighurs and others.

The village is divided into districts. There are two schools, two kindergartens in the village. The main activities of the locals are as follows: maintenance of the railway, power stations, as well as fishing and hunting, selling smoked and cured fish at railway station and along the highway. There is the Lake Balkhash in a few kilometers from the town, not asphalted road leads to it. There are also a few dozens of houses and summer cottages on the beach. Written off train carriages equipped with a makeshift are often used as summer cottages. Ulken is the nearest town, which has a road link. There is a large water tower in the form of a mountain, from which a network of water pipes is laid. At the moment, the village is in a bad condition. Almost all paved roads are in poor condition. There is a critical situation with water supply due to that the vegetation as trees become drought and rare. The drought is increasing due to the reduction of climate change and Balkhash peculiarities.

Cement plant

The

Cement plant is located in a half kilometer from the village Mynaral (Fish factory from the M36 highway. Geographical coordinates of Mynaral (kaz Mynaral) is a village 45 ° 23'11.95 " 73 ° 39'19.12" in Moyinkum administrative center of Mynaral Kazakhstan rural district.

Investors built 2 large aircraft sheds: the first hangar capacity is 25 tons for storage of limestone, the second hangar with the capacity of 20 tons for coal storage. In the future cement plant of Zhambyl region plans to increase its capacity to 1 mln. The village population is 659 people (326 men and 333 women). Geographical coordinates 45 ° 25'26.70 " 73 ° 40'37.67". The village is located 4 km from the M36highway. There is a fish factory in the complex, with a capacity of 1.5 tons. Tones of fish per year are breed under the State program of forced industrial-innovative development of Kazakhstan. The new company employs 200 people; the total cost of the industrial project will be about 600 million tenge.

6 ENVIRONMENTAL IMPACT ASSESSMENT

6.1 Introduction

Karaganda-Balkhash-Burylbaital road section of the Center-South Road Corridor passes through Karaganda Oblast (513 km) and Zhambyl Oblast (147 km). Environment, as well as the technology, methods used in the road construction are same in the whole road section, thus, environmental impacts are common for the whole territory of the planned road section.

During the construction of roads, the main types of environmental impacts normally are:

- air pollution caused by exhaust gases of vehicles engines;
- environment pollution by various road construction vehicles and mechanisms used at construction works;
- noise caused by machinery and equipment and various construction activities;
- pollution by dust from road materials production, excavation works, roadbed and road pavement construction;
- potential pollution of soil cover, surface water sources and various types of vegetation near the road;
- possible exhaustion of water resources and borrow pits;
- disturbance to nesting birds and the habitats of animals;

During operation phase impacts such as air pollution and noise level are dependent on the distance from the carriageway:

- Air pollution and noise level from all vehicles passing through the new route;
- Contamination by dust from wear of road cover and erosion of adjacent soil, pollution of road by dumping of industrial and household waste;
- Potential cases of road killing of animals and birds;
- Interruption of random traffic routes;
- Potential pollution of ground water resulted by the surface runoff from the carriageway;
- Potential pollution of air, water resources and soil resulted by the work of petrol stations, stores that are located along the road;

Zones of Impact

Impacted zones are defined depending on the road category:

1) Zone of Impact: over 3 000 meters, where some impacts of the road may occur (e.g. noise, dust, air pollution);
2) Protection belt: territory adjacent to the right of way, where impacts are expected to occur with higher intensity. In some cases the impact may be significant; noise and air quality, draining, soil contamination, etc.

3) Reserve and engineering belt: territory adjacent to the road that is necessary for emergencies, potential use in the future, roadside services, excavation and earth fills. Significant environmental impacts and changes will occur during the construction period.

Approximate dimensions of the zone of impact, protection belt and reserve and engineering belt are shown in Table 6.1

Table 6.1- Approximate dimensions of the zone of impact, protection belt and reserve and engineering belt for road category

Names of impacted zones	**Distance from road, m, for different road categories**		
	I	**II**	**III**
Zone of Impact	3000/1500	2000/1000	600
Protection belt	250/150	150/90	60/30
Reserve and engineering belt	30	12	-

6.2 Air Impact Assessment

Construction and Operation Period

The proposed activities in construction and further operation of the road section will be accompanied by emissions of pollutants and its following dispersion in the atmospheric boundary layer during the construction machinery operation (emissions resulted by construction works and operation of motors of vehicles and machinery) during construction period, as well as emissions from motors of vehicles traveling on the highway during the operation period.

Table 6.2.1 lists the types of works, names and characteristics of typical emission sources during the construction and operation of the high-speed highway.

Table 6.2.1– Characteristics of emission sources in the atmosphere

Works type	**Name and characteristics of emission sources**	**Name of potential atmosphere emissions**
1	**2**	**3**
Road construction	Soil and construction materials dust generation during machinery and mechanisms operation	Inorganic dust
	Fuel combustion products generation in the internal combustion engines of machinery and mechanisms	Nitrogen dioxide, soot, carbon monoxide, benz(a)pyrene, hydrocarbons
	Welding	Ferric oxide, manganese and its compounds,

		hydrogen fluoride
	Paint works	White spirit, xylem
Road operation	Fuel combustion products generation in the internal combustion engines of motor vehicles	Nitrogen dioxide, soot, sulphur dioxide, carbon monoxide, hydrocarbons C12-C19, lead compounds

The road construction is associated with concrete plants and stone crushers, work of which leads to high dust content. During the concrete production, cement and organic dust, as well as silicon, are emitted into the atmosphere. These substances can cause harm to the human health and environment. Prevention of air pollution as a result of the concrete plant and stone crushers operation is under responsibility of owners of the plant and quarries and is not included in the EIA within the road construction project.

Exhaust gases from motor vehicles are also a significant source of pollution during the road construction period. Moto vehicles are considered to be mobile sources of pollution and emissions from motor vehicles are not regulated by emission permits. The structure of the vehicle engine emissions has a number of components, where toxic gases are the main part: carbon monoxide, hydrocarbons, nitrogen dioxide, lead compounds, sulfur dioxide and solid substances (soot).

The assessment of air pollution level is calculated on the basis of a computer program. The list and amounts of pollutants emitted into the atmosphere during the construction period at the road section within 1620 – 1666 km are presented in Table 6.2.2. The values of maximum permissible concentrations (MPC) of pollutants are obtained based on the sanitary and epidemiological regulations and standards of "Sanitary and Epidemiological Requirements to the Atmospheric Air" No. 629 dated August 18, 2004. The data in the table were obtained by summing the emissions of harmful substances for each ingredient calculated in Appendix 1 using the methods agreed by the Ministry of Environment Protection (currently, the powers have been transferred to the Ministry of Energy of the RK) of the Republic of Kazakhstan. Assessment of impact on atmosphere air during operation is carried out taking into account the increase in traffic volume until 2028 (according to feasibility study data).

Table 6.2.2: List of pollutants emitted into the atmosphere (Maximum Permissible Concentrations (MPC) during construction period within 1620 – 1666 km road section

Pollutant Code	Name of Pollutant	MPCm. s. mg/m3	MPCa. d. mg/m3	Hazard Class	Emission, tons/year
0123	Ferric Oxide		0,04	3	0,0045
0143	Manganese and its compounds	0,01	0,001	2	0,0005
0301	Nitrogen Dioxide	0,2	0,04	2	0,08
0304	Nitrogen Oxide	0,4	0,06	3	0,013
0328	Carbon	0,15	0,05	3	0,005
0330	Sulfur Dioxide		0,125	3	0,0261
0337	Carbon Monoxide	5,0	3,0	4	0,087
0342	Fluoric Gaseous Compounds	0,02	0,005	2	0,0002
0703	Benz(a)pyrene		1*10-5	1	1*10-7
1325	Formaldehydes	0,035	0,003	2	0,001

2754	Saturated hydrocarbons C12-C19	1		4	1,5491
2908	Inorganic dust (SiO2 70-20%)	0,3	0,1	3	148,27832
	Total:				150,0447

The road construction is associated with concrete plants and stone crushers, operation of which leads to high dust content level. During the concrete production, cement and organic dust, as well as silicon, are emitted into the atmosphere. These substances can cause harm to the human health and environment. Prevention of air pollution resulted by the concrete plant and stone crushers operation is under the responsibility of owners of the plant and quarries and is not included in the EIA within the road construction project.

Exhaust gases from motor vehicles are also a significant source of pollution during the road construction period. Motor vehicles are considered to be mobile sources of pollution and emissions from motor vehicles are not regulated by emission permits. The structure of the vehicle engine emissions has a number of components, where toxic gases are the main part: carbon monoxide, hydrocarbons, nitrogen dioxide, lead compounds, sulfur dioxide and solid substances (soot). Concentration of harmful substances contained in exhaust gases during operation of various types of cars in the mixed flow depending on the traffic volume is taken as the estimate value. The impact on atmosphere is considered acceptable if the content of harmful impurities in the atmosphere air does not exceed the maximum permissible concentration set out by SanPiN "Sanitary and Epidemiological Requirements to the Atmosphere Air" No. 629 dated August 18, 2004.

Assessment of the level of the enterprise impact on the atmosphere of the residential areas is carried out based on modeling of emissions spread in the atmosphere, according to "Calculation Methods for Concentration of Air Pollutants Contained in the Emissions of Enterprises. Guiding Normative Document 211.2.01.01-97". In calculating the dispersal of emissions from vehicles and determining the concentration of toxic substances at a distance of 20 meters from the road, a Gaussian model of pollutants distribution in the atmosphere at low altitudes is used. The results of calculations of air pollution are given *in Table 6.2.3*.

In calculation of pollution maximum nonrecurring concentration (MPC) is used in accordance with SanPiN "Requirements to the Atmosphere Air of Populated Areas" No. 3076 dated 18.09.2004, No. 841 dated 3.12.2004, approved by the Ministry of Healthcare of the Republic of Kazakhstan.

Table 6.2.3: Dispersion calculation results of motor vehicles emissions

Emission Type	**Concentration of pollution in the atmosphere at the distance of 20 meters from the road carriageway, mg/m^3**	**Maximum permissible nonrecurring concentrations, MPC m.s.,mg/m^3**	**Average daily maximum permissible concentrations of toxic compounds from the exhausted gases in the air of the populated areas, mg/m^3**	**Hazard Class**
1	**2**	**3**	**3**	**4**
Carbon Monoxide	0,056	5,0	3,0	4
Hydrocarbons	0,011	1,0	1,5	3
Nitrogen Oxide	0,0056	0,085	0,04	2

Lead Compounds	0,000032	0,0010	0,0003	1

Conclusions for Construction and Operation Periods:

Construction period: the results of calculations of atmosphere air emissions during the construction and operation period shall be within the limits of the set values based on the applicable laws of the Republic of Kazakhstan. As the road mostly passes through open land with only few residential areas, harmful effects on human health will be minimal. It is very important not to allow arrangement of construction warehouses or construction sites near residential areas. During the construction period, it is necessary to carry out regular monitoring in accordance with Kazakhstani and international limits (e.g., WHO) if the parameters are not regulated. The Contractor shall be responsible for monitoring, and will be accountable to the construction supervision consultant and local environment protection authorities.

Operation period: Emissions from transport should not exceed the maximum permissible concentrations at the distance of 20 m from the nearest traffic lane. The concentrations of toxic substances that are contained in the exhausted gases within the area adjacent to the road territory – reserve and engineering belt – will be within the allowed MPC limits during operation period, and will not have any adverse impact on the environment and human health.

6.3 Noise and Vibration Level Assessment

Construction Period

During construction, there will be a temporary adverse impact due to the noise of the construction equipment, especially heavy machinery. Compaction equipment, blasting operations for cuts and excavation of foundations and grading produces noise and vibration. Construction noise is generally intermittent, attenuates quickly with distance, and depends on the type of operation and location and function of equipment.

The most sensitive areas within the project area are hospitals, housing areas and rest homes. Consideration will be given to installation of a noise barrier if construction (or operation) noise levels exceed the national standards or cause nuisance or interfere with school or health service provision activities.

All reasonable measures will be taken to limit noise generation to the EHS Guidelines of the World Bank Group which sets that receptors such as residential, institutional, and educational areas should have noise level of 55 dB(A) from 7AM to10PM (daytime) and no greater than45 dB(A) from 10PM to 7AM (nighttime). Use of construction equipment and vehicles will be limited to acceptable time when they have the least impact.

Vibration during the construction period will also be a significant consideration, particularly vibratory rolling of the granular pavement layers, or blasting, or diversion of abnormal amounts of public traffic onto usually lightly trafficked side roads. Some of the existing structures close to the road are of mud-bound construction or otherwise of poor quality, and may be damaged by vibration. The contractor will be required to carry out trials of his proposed construction methods close to vulnerable structures, for prior approval, and will not be permitted to use methods which will cause damage (even if he offers to be responsible for compensation). A joint (building owner/consultant/contractor/Employer) dilapidation survey of vulnerable structures close to the new road will be carried out before construction. This will be used to verify any claims of damage alleg-

edly caused by his work, for possible compensation. In addition, a similar prior survey will be made of condition of the road and adjacent structures along proposed diversion roads (whether to be used by the general public only, or by construction traffic also), which will be required to be maintained to at least their preconstruction condition, and reinstated after use.

Cooperation between the contractor and the local residents is essential and it is the responsibility of the project supervision consultant to arrange meetings between these parties and arrange such matters as work schedules (hours of equipment operation, traffic lanes to be kept open, diversion roads, etc.), locations of work camps and material storage areas, and sitting of rock crushers and batch plants. Measures to be included in the project to mitigate the effects of noise and vibration include:

- Requirements in the EMP and contract documents that all exhaust systems be maintained in good working order and that regular equipment maintenance will be undertaken;
- The contractor will prepare a schedule of operations that will be approved by the project supervision consultant. The schedule will establish the days and hours of work for each construction activity and identify the types of equipment to be used;
- Prohibition of any construction activities between 10 pm and 7 am in settlements or close to sensitive receptors such as hospitals and schools;
- The contractor will consult with the community in respect of construction activities and potential noise and vibration impacts. The consultation process will be facilitated by the project supervision consultant;
- Blasting if applicable to the site will only be carried out during the day and according to a preestablished schedule, the adjacent communities will be notified of the blasting times well in advance;
- Use of blasting mats to reduce noise during blasting operations;
- Prior to commencement of construction, the contractor, in conjunction with the project supervision consultant, will undertake a dilapidation survey (including photographs) of all buildings adjacent to the new road and diversion roads (also the original pavement condition of diversion roads);
- Trials of the contractors' equipment (especially vibratory rollers) will be carried out adjacent to vulnerable structures, and if cracking or other damage is observed to occur, the contractor will be required to amend their working methods to avoid damage (for example, use of non-vibratory rollers with thinner layers or cement stabilization, or increased asphalt thickness);
- Use of low volume charges will reduce the potential for vibration induced damage to structures; and
- In the event of damage proven to be due to the contractor's activities, owners of structures will be fully compensated.

Technological processes during the construction of roads are the source of intense noise, which can adversely affect human health. The noise intensity resulted by road construction machinery depends on the type of machinery and equipment, drive type, operating mode and the distance from the construction works area to residential areas. Especially intense noise is generated by bulldozers, vibra-

tors, compressors, excavators and diesel trucks. The noise that occurs during construction is temporary and localized, but can still create an annoying impact.

However, according to GOST 12.1.003-83 "Noise", noise level standard should be within the Maximum Permissible Level (MPL) of 70-80 dBA. Zones with noise level above 80 dBA should be marked with safety signs. To ensure acceptable noise levels, construction activities plan should not include works commencement at night time.

Conclusions: Construction Period

In view of the general isolation of the project territory, it is concluded that there will be limited noise impact on any residential houses. Based on the road construction experience for similar projects, it is still assumed that the noise level will remain below the level recommended in the abovementioned normative documents. There will be a slight increase in traffic flow on the existing road and access roads, as well as adjacent roads that are leading to the project alignment due to the construction implementation.

The Design Engineer has determined possible quarries locations for Section 1. All of that is located north from the project road, typically at the distance of at least 5 km. The quarries locations have been approved and the selected Contractor – in consultation with the Engineer and local environmental authorities – will propose locations that are most suitable for the start of exploitation activities. Nevertheless, whichever quarries are used, the existing minor roads will be used as access roads to the project road.

It is unlikely that the construction machinery will have a significant impact on traffic volume and noise level near the settlements on the existing road. However, the Contractor will have to carry out measurements of noise levels prior to the start of any works, and then regularly monitor noise levels during construction. The construction machinery will significantly increase traffic flow and potential noise level increase near the residential areas is possible for the minor roads that are crossed by the project road, as well as for any access roads. Traffic flow count for all possible access roads to the road construction site together with the regular monitoring program will be prepared prior to the construction period as a part of the environmental comprehensive examination and management measures.

Operation Period

Transport factors have the greatest impact on the noise level: traffic volume, type of vehicles, speed, vehicles operating condition, transport and operating condition of the road. Sources of noise in a vehicle are the engine and tires. The noisiest vehicles are heavy trucks and trailers with diesel engines; the "quietest" vehicles are high-performance cars.

Maximum permissible levels (MPLs) of noise are the factor level, which should not cause diseases or deviations in the health state in daily work (during the whole work experience) during the work and separate life spans for the present or future generations.

These noise calculations during operating period are shown in Appendix 1.2.

Calculated noise MPLs are adopted in accordance with the "Standard Specifications for Noise Levels in Residential and Public Buildings and Housing Areas" No. 841 dated December 3, 2004 of the Ministry of Healthcare of the Republic of Kazakhstan.

Permissible maximum noise level values generated by vehicles have been adopted in accordance with the above-specified standards – 70dBA. The analysis of the obtained results shows that the distance from the road to the 70dBA sanitary standard is approximately 20 meters without installation of any noise barriers, and 10 meters – with the installation of noise barriers, and will not have negative impact on living conditions of the population.

Operation Period Conclusions:

As referred to the above-specified, there are only several locations with exceptions, where the alignment passes close to residential areas: houses at 43 km, 220 km, 307 km and 349 km. There, houses are located close to the existing road, which will be used for construction of the new road. Based on the experience of similar road construction projects, it is assumed that the noise level will remain below the level set under the above-mentioned normative documents.

During the operation period, the predicted noise impact on any residential areas will be minimal, and if necessary, it may be further reduced by appropriate engineering measures, such as noise barriers, plantations and landscaping elements. This approach has been successfully implemented in the World Bank financed "South West Roads Project" which has similar objectives, methods, volumes and problems. Regular monitoring of the noise level and characteristics along the alignment and the adjacent roads is required which will be carried out by the Road Maintenance Department (RSE "KazAvtoDor") under the Road Maintenance Funds. If any additional mitigation measures for noise level reduction are necessary, it will be included in the contract budget for roads maintenance and rehabilitation and carried out within that contract.

6.4 Water Bodies Impact Assessment

This Section covers the following: 1) availability of water for the construction and operation of the road, and 2) potential impacts, including pollution that the road project may have for water resources in this area: surface and ground water.

Water Requirements for the Construction Period

Water is used for construction and household activities, industrial needs and drinking use for the workers who are involved in construction implementation during the project construction.

Use of water from surface and ground water within construction of roads is allowed only with the consent of the Committee for Water Resources under the Ministry of Agriculture of the RK. According to the detailed design of the 1666km - 1713km road section, service water will be used from the lake located near Karkaralinsk - Aksu Ayuly road. Distance from the lake to the start of the project territory is 73 km. Distance from the lake to Karkaralinsk - Aksu Ayuly road is 6 km away from the road. Distance from Karkaraly - Aksu Ayuly to Karaganda - Balkhash is 6 km. Use of water from the river will result in the river exhaustion.

Other sources of water for construction purposes will be determined after completion of the design stage for the remaining 12 sections and obtaining a permit for special water use from the Committee for Water Resources under the Ministry of Agriculture of the RK.

Water use level during construction is low. Water for industrial needs is consumed for the preparation of concrete and solutions.

Drinking and household water consumption calculation is based on the number of employees and duration of the construction period. Water consumption calculation in construction period for the whole section of the road will be estimated in the EIA report, Maximum Permissible Discharge (MPD) will be according to the normative documents of the RK.

Pollution of Surface Water during the Construction Period

Disturbance of the hydrological regime of rivers, waterfront measurements, watercourse sections, activation of river bed processes in the bridges construction.

Conclusions on Water Resources during the Construction Period

During the road construction process, water is used for household and industrial needs (preparation of mixes, feed of wheels washing system, open ground irrigation).The source of drinking water supply is imported water. Safety and quality of water will be provided according to "Instruction on Quality and Safety of Food Products" approved by the Resolution of the Government of the Republic of Kazakhstan No.1783 dated November 29, 2000.

It is planned to receive process water supply from the rivers which are located close to the road and upon the approval of the Committee for Water Resources under the Ministry of Agriculture of the Republic of Kazakhstan. Drinking water will be imported and supplied by Contractors.

According to information obtained as the result of study of the road section by the representatives of "KazdorNII" JSC and "KazCEP" LLP, the area has abundant reserves of ground water. Surface water (i.e., the Lake of Balkhash and the rivers that flow into it) has the capacity to supply water for engineering purposes during the construction process. Based on the preliminary estimates for water requirements during the construction period, it is assumed that adequate volumes of water for all construction activities and water are available.

Potential Risks and Impacts related to Hydrocarbon Spills during Construction Period

During the construction period to enter either running or dry streambed nor shall it will be disposed of in ditches or small waste disposal sites prepared by the Contractor. Bitumen storage and mixing areas must be protected against spills and all contaminated soil must be properly handled according to legal environmental requirements. Such storage areas must be contained so that any spills can be immediately contained and clean up. Development of an emergency response plan.

Water Requirements during the Operation Period

Water consumption will occur for household needs of road servicing enterprises. Water will be also required for various purposes in the recreation/roadside service areas.

Conclusions on Ground Water Pollution: Construction and Operation Period

Based on the groundwater level within Section 1 and project characteristics, it may be concluded that ground water resources pollution during the construction and operation period will not occur. There will be no considerable subsoil works expected, such as excavation or drilling. In general, water supply is not a problem in the project area. Measures will be applied to prevent overflows. The top water level, which is typically not used for the drinking water, will not also be disrupted by the works.

During the operation period, ground water pollution will not occur provided that the requirements based on the best practices are reflected in the project and are properly implemented.

Pollution of Surface Water during the Operation Period

Surface water pollution is resulted by polluted surface road runoff, namely because of inappropriate technical maintenance and cleaning of roads, delayed technical maintenance for the drainage system, as well as poor control of dirty equipment movement during the season of works.

Assessment of surface road runoff pollution and identification of the necessity for its cleaning is carried out through calculation of maximum permissible discharge of substances into the water body. Maximum permissible discharge (MPD) of substances into the water body is the mass of a substance in the wastewater that is maximum permissible for the lead with the regime established in this point of water volume per unit of time to ensure the quality of water in the checkpoint.

The detailed design recommends calculating the maximum permissible discharges MPD from bridges located in the areas of the projected road through rivers with permanent drains. Calculation of MPD will be made in accordance with "Recommendations on Accounting Requirements for the Environmental Protection in Roads and Bridges Designing". Discharges of pollutants into water bodies should be within the MPD limits and, in case of compliance with all standards and procedures, the impacts on water resources will be slight in the operation period.

Ground Water Pollution: Construction and Operation Period

Based on the ground water level within Section 1 and project characteristics, it may be concluded that pollution of ground water resources during the construction and operation period will not occur. There will be no substantive subsoil works, such as excavation or drilling, expected. Water for construction works and camps will be taken in relatively small quantities from the existing wells, or water pipelines. In general, water supply is not a problem in the project area. Measures to prevent overflows will be applied. The top water level, which is typically not used for drinking water, will not also be disrupted.

During construction, negative impacts on water quality could be caused by accidental spills of polluting or hazardous materials if they occur near water courses. The road rehabilitation activities will not induce accidents and therefore there are unlikely to be any additional incidents over and above those that would occur without the project, hence no mitigation measures are proposed other than strict motoring of the construction equipment and road works in relation to water quality testing routinely.

During the operation period, pollution of ground water will not occur provided that good practice requirements have been reflected in the design and properly implemented.

Borrow pits

Possible borrow pits were defined by the design engineers for two sections, where the design stage has been completed, and borrow pits for the remaining sections will become known after the design works completion. However, the Contractor will make the final decision on the borrow pit selection.

The existing borrow pits have received the EIA approval from the authorized authorities and it, thus, may be assumed that they will not affect water levels, which are used as drinking water resources. Moreover, except accidental overflows (that is unlikely to happen on purpose), the development of borrow pits has insignificant pollution potential. The greatest risk is connected with the failure to properly close and re-cultivate the pits, which may lead to its conversion into illegal waste dump sites, which would have a substantial pollution potential. Thus, an important part of the borrow pit closure will be dismantling and/or blocking of all access roads.

Construction camps

Construction camps will accumulate significant quantities of wastes and waste waters from workers and staff activities. In view of the scale of the construction activities, the number of workers who will present at the same time at the site will reach several hundreds and possibly more people. At this stage, it is impossible to define the locations of the construction camps. Since the road section mainly passes through agricultural areas, it is necessary to prevent soil and ground water pollution. Therefore, it will be necessary to ensure appropriate offsite waste water treatment and debris disposal which must be provided by the construction camps design.

Impact on Water Bodies. Conclusions

In general, the impact on ground and surface water is expected to be low. There will be no soil excavation that might affect the ground water regime and change the water balance. Water courses and rivers will be crossed by the bridges with appropriate dimensions. The road bed will have sufficient culverts to prevent blocking of water and subsequent water logging. Data on artificial structures are described in Section 2.5 of this report.

6.5 Soil and Land Resources Impact Assessment

Impact on Soil

Cleaning of the territory, excavation and filling, road bed construction are usually the main impact on soil and the sub soil environment. Significant volume of topsoil is necessary to be removed for the construction of the road and bypasses, borrow pits, construction camps and other construction activities. There is a possibility for pollution, disturbance and damage to the soil cover in such areas. In particular, soil can be compacted and damaged along temporary access roads and in construction sites areas. Disturbance and damage is inevitable, and it will be more critical in the areas with high humus content in soils that are very fertile. However, this could be minimized by appropriate construction procedures implementation.

Soil Pollution

There is possibility of soil pollution during the construction and as a result of operation oil products spill and sub soil on the project road and the adjacent roads. Such pollution may further have impact on surface and ground water, as well as on the agricultural activities near the project road. Some pollution can occur during normal construction activities, but the most serious pollution can occur from accidental fuel leaks and in case of long-term storage of construction materials without following any precautions.

During the construction phase, the most significant pollution will be the pollution of sub soil layer that will be exposed after the fertile layer removal.

Soil pollution may also occur during the operation period. The main hygienic criterion for evaluating the risk of soil pollution by chemicals is maximum permissible concentration (MPC) – the maximum amount of this substance in mg/kg of bone-dry soil, which guarantees the absence of negative direct impact on human health. Assessment of such impact risk is based on lead assessment, which is considered the indicator of toxic elements presence in the soil. Maximum permissible concentration (MPC) of lead in soil in the Republic of Kazakhstan is calculated according to the "Standards of Maximum Permissible Concentrations of Harmful Substances, Harmful Microorganisms and Other Biological Soil Pollutants", approved by joint Order of the Minister of Healthcare of the RK No. 99 dated 30.01.2004 and the Minister of Environmental Protection No.21-p dated 27.01.2004, and is set at the level of 32 mg/kg.

According to calculations of the lead level at a distance of 20 meters from the roadway, it ranges from 14 to 47 mg/kg. MPC of the lead in soil is 32 mg/kg. Correspondingly, the measured lead in soil in separate areas at a distance of 20 meters is slightly higher than the MPC. Where there is debris, broken pavements and tires, broken exhaust pipes of cars, fuel leaks and lubricants, or negligent acts of drivers and maintenance personnel, and other poor management and technical maintenance of roads, additional pollution and lead level increase may occur.

Deicing materials, especially salts that get to the roadside with precipitation and melting snow from the road, are no less dangerous than other toxic materials. Thus, 0.04% level is taken as the limit of permissible concentration of CL (chlorides) when exposed to deicing agents on the soil in the roadside of this zone. With significant accumulation, it can change the biological soil composition of the roadside.

Soil Impact Conclusions: Construction and Operation Periods

Based on the researches and characteristics of this territory, it can be concluded that provided appropriate construction process, there will be no damage to soils and sub soils, such as pollution, erosion and landslides, during the construction and operation periods. During the operation period, adverse impacts on soils and sub soils will not also occur.

6.6 Flora and Fauna Impact

The environmental natural complexes protection, including vegetation, wildlife and natural landscapes, is one of the main objectives during the design stage and the alignment project implementation. Special protection is necessary for rare or endangered plant and animal species.

Road construction and its operation may have impact on flora and fauna either 1) during the construction, through the loss and destruction of habitat, or 2) during the operation, through the impact of pollutants on flora and fauna. Traffic emissions can cause destruction of pigments, suppression of proteins and enzymes synthesis and other functions of plants. The road can also cause impact on individual animals that cross the road or live close to the road due to segregation of some animals populations into unsustainable small groups.

Flora pollution can lead to disruption of growth and development, acceleration of aging processes, especially in perennial plants. In designing measures to reduce damage to flora, it is necessary to take into account the fact that broad-leaved plants survive better than conifers in air pollution, since the transpiration processes occur quicker in it. Pollution of the ground surface and vegetation from traffic emissions occurs gradually and is directly dependent on the distance from the road carriageway. Some plants are more sensitive to pollution from vehicles exhaust gases than humans and animals. Various deicing chemical agents, mainly salts, should be noted among inorganic pollutants

that may have a significant impact on natural environment. Salts have a negative effect on territories that are adjacent to the road, including soils, plants, insects, animals and birds. Under the influence of these salts, the structure and physicochemical properties of soils deteriorate, which has an adverse impact on all plants.

Damage of salts to afforestation and plants occurs as a result of direct contact with ground parts, as well as through the root system. Direct contact with the salts leads to the destruction of plant tissues, especially bark. Sodium ions that are concentrated in the soil inhibit the absorption of nutrients by the plants' root systems.

During the operation period, various representatives of fauna may be poisoned or killed as a result of roadside pollution by heavy metals, salts, oil products and other harmful substances, as well as eating vegetation by animals and birds. However, the new planting and landscaping may minimize pollution in the immediate vicinity of the road.

Dust, depending on the chemical composition, has a specific effect on plants caused by the penetration of harmful compounds into the leaves tissues. At the same time, accumulation of compounds in plant tissues causes disturbance of metabolic functions of the organism, reducing the amount of photosynthetically active energy absorbed by leaves and results in acceleration of the aging processes.

Furthermore, cows, horses, camels crossing the road may be killed. Hedgehogs, foxes, mice and rats are often killed. Although such cases are unfavorable, the total number of animals killed this way is not large. In general, impact assessment of the observed object on the vegetation cover is characterized as acceptable one. Exploration of the area provided meeting all the operation rules will not have negative impact on the environment.

Flora and Fauna Impact Conclusions: Construction and Operation Periods

In conclusion, the natural flora and agricultural territories that are located close to the road may be potentially adversely impacted by the construction and operation activities; however, these impacts are unlikely to be significant.

No adverse impact upon habitats and flora of the project area during construction phase are expected as a result of road rehabilitation on existing alignments other than the by-passes and widening of the road areas. Trees alongside the road shall be protected against damage caused by construction machines.

According to the preliminary observations, an insignificant number of trees will be cut down within the right of way.

Based on the above-specified, field studies and discussions, there is no evidence to indicate that the expansion of the existing road would have a significant impact on the fauna or any rare, endangered or vulnerable animal species.

Given the fact of existence of the road for quite a long time before the reconstruction, the established way of wildlife habitat in the surrounding area can be marked as a minor additional impact.

All the reconstruction activities are carried out only within the existing route, probably, except the sections in Aktogay, Moyynkum and Zhambyl districts that are adjacent to the road territory due to road passing through the water protection zone of Balkhash Lake, and may not have a significant negative impact on flora and fauna. In addition, the following should be noted. Adverse effects on

vegetation occur from traffic emissions impact. The experts found effects of different pollutants that cause destruction of pigments, suppression of proteins, enzymes synthesis and other functions of plants. All these lead to disruption of growth and development, acceleration of the aging processes, especially in perennial plants. Besides, the ability of many plants to accumulate heavy metals that are polluting the soil should be noted. Pollution of the ground surface and vegetation by traffic emissions occurs gradually and directly depends on the distance from the carriageway. A number of factors adversely affecting the wildlife should be noted. Factors that hinder natural migration of species to places of temporary and permanent habitat, exchange of the gene pool, reproduction, etc. These are design elements of the road – slopes, fillings, excavations, inclines, fences, roadbed itself. Disturbance factors that are frightening animals and violating its environment are noise, vibration, light from the traffic flow.

As it is known, reaction of animals on disturbance factor may vary in the different species. Under the influence of gas pollution, noise, vibration in the roadside, species change occurs. As a result of roadside pollution by heavy metals, salts and other harmful substances, the vegetation that is eaten by animals and birds may cause poisoning and death in various representatives of the fauna. Collision with moving vehicles may cause death of in the fauna representatives on the road. All these factors lead to a decrease in population size. Slight adverse impact on flora and fauna directly from the reconstruction activities is possible only during the construction period due to the random construction equipment movement outside the construction site. Illegal actions of people towards animals and plants (shooting of wild animals, cutting down of trees, etc.) in conservation areas are excluded.

6.7 Social Impact Assessment

During construction and operation, noise, air and water pollution may affect residents who live nearby, and impact on people's health in extreme conditions, on socially vulnerable groups, in particular: the elderly, sick persons and children. However, as referred to above, noise, air and water pollution will not be significant.

Land acquisition may be required for the road construction which may affect people's income and livelihoods for a short term. In this project, there is no acquisition of structures that are subjected to road construction for Section 1. This issue is discussed in detail in the Resettlement Action Plan (RAP).

The road development may have some impact on economic activities of the local communities on the existing road. It should be noted that there are only few small businesses near the road in the villages that are not expected to be relocated, and negative impacts will be minimal.

The Employer deems that it is important to consider development of service areas, and, according to the project, the possibility of development for potential recreation/service areas is considered. Normally, such zones provide recreation areas, petrol stations sites, goods purchase and meals areas, as well as possibly overnight-stay accommodation. These areas can function as a trade platform for local farmers and sellers. Installation of information signs for directions to villages and local services, and temporary sites provision for local traders will mitigate some loss of trade. This issue has been outlined in Subsection 4.3.6 of this report.

There is no mechanism for compensation of businesses' loss of trade in Kazakhstan. This type of business and income loss is not provided in any of the World Bank Operational Policies and there is also no evidence to show that such measures are covered in any other legislations of developed and

developing countries. In some countries (the UK, for example) businesses that can prove that its activity has been significantly damaged by a nearby road construction are able to claim reductions in their local taxation.

However, according to the Land Purchase Compensation and Resettlement Framework's, Entitlement and Compensation Matrix, the Business owner will receive a cash compensation equal to one year income; in case if it is temporary, so cash compensation for the period of loss. This compensation is based on tax declaration or official minimum wage whichever is greater

Although, there may be insignificant adverse impact on local economic activities, in general, the road will bring significant benefits to the local, regional and national economies. High-speed, safe road that is accessible in all weather conditions will allow efficient and rapid transportation of goods between China, Kazakhstan, Russia, as well as Europe and Central Asia. Goods manufactured within these countries will be quickly delivered according to the route. Agricultural products from this area, where it is a major occupation, and other local products could be quickly transported to wider markets. Labor could be more freely moved between the countries; tourism that is more significant for regional and international economies could be developed, as well as use of natural and social peculiarities of Kazakhstan. Larger communities along the road will benefit from faster travel times between the cities and to other urban centers in the southern and central parts of Kazakhstan. More opportunities for employment and businesses development will appear.

Preliminary public hearings on M36highway construction (reconstruction) were held with the residents of these settlements. As a result of the preliminary public hearings, the residents of these settlements do not have conflicting opinions about the reconstruction and expansion of the road.

6.7.1 Contractor's Work Camp

During construction, there will be a temporary increase in population whereby construction workers will settle in the area for a specific period of time. The expected workforce will include both skilled and non-skilled workers. The influx of people looking for work is a common phenomenon with all development projects since word spreads rapidly of the possibility of work and opportunities for earning money. The population increase and the project activities will have impacts on the community.

Although the existing communities are highly vulnerable, the impacts caused by population influx are considered as Medium Negative due to the fact that it will be short term in nature and reversible since most people will go back after construction.

Sites for contractor work camps will all be approved by the Employer and will not be permitted in any environmentally important or sensitive areas.

In terms of impacts on fauna, there is the potential for construction workers to poach edible animals and birds of the locality in spite of prohibitions. The contractors will be responsible for providing adequate information to the workers regarding the protection of fauna.

Contractors will be responsible for supplying appropriate and adequate fuel in workers' camps (coal, liquid gas, electricity etc.) to prevent fuel-wood collection. Construction vehicles shall use carefully-located designated temporary access and haulage roads to minimize damage to habitats.

Construction camps may place stress on resources and infrastructure of adjacent communities which could lead to antagonism between residents and workers. To prevent such problems, the contractor will provide temporary facilities in the camps such as health care, eating and sleeping areas (including a cook and provision of meals), water supply, and prayer areas.

The project has the potential to contribute to local poverty reduction through provision of income generation opportunities such as construction employment and provision of goods and services to workers.

The mitigation measures require a number of specific provisions to be included in contract documents including provisions for (i) a set aside for jobs for the poor (60% of the direct unskilled and semi-skilled labour), including a minimum number of persons to be given agreed structured training for more skilled posts; (ii) explicitly prohibiting the use of foreign unskilled and semi-skilled workers or unskilled and semi-skilled workers from elsewhere in Kazakhstan unless there are no local unskilled and semi-skilled workers available; (iii) payment of legal wages to workers; (iv) no use of trafficked or child labour for construction and maintenance activities; (v) inclusion of women as well as poor in the local construction force, in accordance with the local gender balance, to the maximum extent possible; (vi) no differential wages being paid between men and women for work of equal value; and (vii) use of locally sourced materials used in the rehabilitation to the maximum extent possible;

Women are likely to be least favoured in the job provision. This is because of the nature of jobs available in the road construction that is perceived to be done by mainly men. There is likely to be developments of relationships between workers and the women of the area that are either engaged or already married, this can result into marriage break ups. There could be immorality especially with the young girls of the area in efforts to gain favour for employment opportunities, this can result into spread of sexually transmitted diseases such as HIV/AIDS. Impact on HIV will be long-term as its spread and associated impacts will continue even after construction.

Contractors are required to ensure jobs should be equitably distributed to both women and men as long as one has the qualification rather than basing on gender to allocate jobs.

6.7.2 Health and Safety

The project's construction phase can cause a range of health and safety impacts. The main impacts on health and safety are associated with (i) risks from construction work (noise, risk of injury), (ii) facilitation of transmission of communicable disease; (iii) contamination of local water supplies; and (iv) traffic safety issues.

The transmission of communicable diseases such as sexually transmitted infections (STIs) and even HIV/AIDS is a potential impact posed by construction workers engaging in either commercial sex or sexual relationships with local people. The civil works phase of the project can pose risks for both the construction workforce and the communities along the roads for the civil works/construction period. High risk groups in the project area include traders, people from household who travel for marketing or selling, seasonal migrants, poor rural people (who risk passing it on to their spouses or partners), intravenous drug users (IDUs), and commercial sex workers (CSWs).

Potential impacts to local water supplies include the possibility of temporary construction camps and the water supply and wastewater disposal associated with them. Contract provisions to ensure

that these facilities are properly sited will be incorporated in project contract documents. Road improvement projects can also inadvertently cause adverse impacts on road and traffic safety as a result of higher vehicle speeds due to improved road conditions. The proposed rehabilitation works do not include design improvements that could encourage higher speeds above the design speed. However, some improvements may be carried out to improve safety, particularly line-of-sight, and at accident black spots. In towns, the design speed will be set at the statutory speed limit for such areas, with prominent speed limit and hazard signage and a ban on non-delivery parking, which are usually strictly enforced by the traffic police, and footpaths, pedestrian crossings, and other safety features.

Air and noise pollution, which can affect the social as well as physical environment, have already been discussed.

Mitigation measures for the foregoing impacts include:

- Each contractor will recruit an environmental, health, and safety officer (ESO) to address health and safety concerns and liaise with the project supervision consultant and communities;
- Training of all construction workers in basic sanitation and health care issues, general health and safety matters, and on the specific hazards of their work;
- The contractor will provide personal protection equipment, such as safety boots, helmets, gloves, protective clothing, goggles, and ear protection, in accordance with relevant health and safety regulations, for workers;
- Implementation of a STIs/HIV/AIDS awareness and prevention campaign which includes HIV in the Workplace seminars and training provided through UNAIDS;
- Provision of hard, instead of soft shoulders, and road markings and signage to enhance safety and indicate that pedestrians should use the shoulders, rather than mix in the main stream if traffic;
- The contractor will provide adequate health care facilities including an HIV/AIDS education post and first aid facilities within construction sites;
- Contractors will ensure that no wastewater is discharged to local water bodies and safe and clean drinking water is provided to all workers;
- No site-specific landfills will be established at the construction camps;
- Septic tanks and garbage receptacles will be set up at construction work sites and camps, which will be periodically cleared by the contractors to prevent outbreak of diseases;
- Provision of adequate protection to the general public, including safety barriers and marking of hazardous areas in accordance with relevant safety regulations;
- Provision of safe access across the construction site to people whose settlements and access are temporarily severed by road construction.

6.7.3 Road Safety along the Villages

Enhancement of road safety solutions such as sidewalks, bus stops road crossings, cattle passes; guardrails, safety barriers, etc. will be designed and implemented with input from stakeholders through consultations.

Advantages of M36 highway expansion for a village:

- transport accessibility of the district
- reduction in the number of accidents involving pedestrians
- ability to expand roadside service businesses

Disadvantages:

- High level of noise impact for a period of reconstruction/construction.
- One of the methods of avoiding increased noise level during M36 highway operation after reconstruction completion is a forest belt arrangement along the village.

Social and Economic Environment Impact Conclusion: Construction and Operation Periods

There will be some adverse social and economic impacts, including various disturbances during the construction period and potential losses in trade and business on the existing road, but, in general, the high-speed road construction will have positive impact on the socio-economic environment in the south of Kazakhstan.

6.8 Physical Cultural Resources Impact Assessment

Detailed study of the territory in close proximity to the road section was conducted through works with archival and bibliographic data, topographical maps and satellite images. As a result of the study, historical and cultural monuments in the zone of the road alignment have not been detected. More detailed report on archaeological issues and cultural heritage is given in the Appendix 2: Archaeological Expertise Report for Karaganda – Balkhash – Burylbaital road.

6.9 Road Safety and Aesthetics Impact Assessment

Road Safety

Road safety and potential accidents involving pedestrians and all road users are very important issues for all the new and existing roads.

It is expected that the existing traffic flow, particularly for long distances (trucks and buses), will be reduced and the number of accidents will be also reduced. Risk to pedestrians and non-motorized transport facilities along the existing route will be also decreased.

Traffic on the project road will be significantly safer due to the improved design (e.g., optimized curve radii), separated carriageways in two ways, better visibility and limited local access. Intersecting traffic and slow and non-motorized transport facilities traffic will be eliminated.

Nevertheless there will be still some danger for pedestrians remaining. Farmers, farm workers and herdsmen may need to cross the road at certain points, as well as there will be some pedestrians crossing the road near settlements.

Aesthetics

The proposed road passes through areas of high aesthetic quality landscapes. Therefore, conservation of the natural landscape is highly important. The proposed road project will ensure that the landscape quality will not be adversely affected by the road construction and will not detract the landscape aesthetics in any way.

6.10 Wastes Generation

Wastes Generation during Construction

During the construction activities, construction wastes and solid wastes from the working staff will be generated.

During the road construction and operation, construction wastes will be mainly generated:

- Inert materials, such as filling material, sand and gravel mix, concrete, crushed stone
- Potentially adverse or hazardous substances, such as wastes from construction camps, crushed stone from crushing plants, containers from fuels, lubricants and construction chemicals, ferrous steel scrap, welding electrodes stubs.
- Timber from cut-down trees and other organic substances from cleaning the construction site

Standards for wastes generation and limits for its placement will be calculated according to the Environmental Code of the RK and applicable procedures agreed by the RK. The calculation results will be presented in the EIA report for specific road sections (lots).

Wastes Generation Estimates during Operation Period

Wastes generation during operation period will be mainly comprised of gravel and salt remnants from winter maintenance, sludge from clearing pools for waste water from the road surface, asphalt, concrete and gravel from repair and maintenance works. None of these wastes are hazardous and may be disposed to the existing municipal dump sites, landfills for inert materials (gravel, crushed stone) or recycling facilities (cement and asphalt). The annual quantities depend on weather conditions (duration and severity of winter conditions) and volume of maintenance works. Volume varies from hundreds to thousands of m^3 per year.

In addition, there will be wastes and debris generated from the road users as a result of various activities within the planned recreation/roadside service areas. Volume of these wastes can be quite significant if all services areas operate, although it is likely that all these areas will be operating for many years.

6.11 Cumulative Environmental Impacts

Cumulative impacts include direct and indirect impacts from the road construction. The following table presents potential cumulative impacts of the road construction projects implementation:

Type	Description	Examples
Simultaneouscumulative impactsfrom multiple sources	Frequent, repetitive and simultaneous environmental impacts	Increasing noise level from the construction of various facilities
Delayedimpacts	Time delay between the impact	Changes in the surface of the water

	cause and effect on other elements of nature	leads to changes in shallow water ecology
Transboundary movement	Impacts occur at a great distance from the source	Transfer of air pollutants over long distances
Fragmentation	Changes in the landscape	Division of woodland into parts resulting in the division of animal groups, ecosystems
Synergistic effects	The effects occurring as a result of merging of several impacts, the nature of which is different from the original sources	Combination of NOx and SOx, which results in smog formation
Indirect impacts	Indirect impacts occurring from the direct impacts	Construction of commercial and residential facilities due to construction of the road, which entails impacts on elements of the environment
Initiators	Causes fundamental systemic or structural changes	Deterioration of the water system due to chemical pollution from the road flushing and clogging
Receiving impacts in small portions	Increasing or decreasing impacts	Gradual disappearance of natural places, such as forests, as a consequence of infrastructures development

Impacts on the atmosphere, water bodies, soil, noise pollution may collectively have a significant impact on the landscape and ecosystem. The impacts associated with the project implementation, such as quarrying, water intake from surface or ground water for construction and drinking needs will be included in development projects, as well as in the EIA developed for each road section in accordance with the applicable laws and normative documents of the Republic of Kazakhstan.

The impact resulted by the road construction project may be insignificant, but in the future it may have significant potential impacts on the environment in combination with the implementation of other projects in the alignment area. In accordance with applicable laws and normative documents of the RK that are regulating the development of environmental projects for economic and industrial activities, the EIA is developed separately for each project. Currently the zone of project influence is underdeveloped and there are no any cumulative impacts in relation to already implemented projects/ impacts factors. It should be noticed that currently there is no information about the projects that are planned to be implemented in the future in the region of the alignment are unknown.

Environmental permits are obtained by those responsible for the projects implementation taking into account assessment of cumulative impacts on environment. To reduce the load on the ecosystem in a particular area, the Committee for Environmental Regulation, Control and State Inspection in oil and gas industry under the Ministry of Energy of the RK may refuse to issue a permit for the implementation of other projects in the road alignment region and require to change the project implementation location.

7 IMPACTS MITIGATION MEASURES

Karaganda-Balkhash-Burylbaital road section of the Center South Road Corridor passes through Karaganda Oblast (513 km) and Zhambyl Oblast (147 km). The environment, as well as the technology, methods used in road construction, is the same, thus, Environmental Management and Mitigation Measures are generic for the whole territory of the planned road section.

7.1 Air Impact Mitigation Measures

Mitigation Measures during the Construction Period

The concentration of pollutants for each source of pollution when reconstructing the road shall not exceed the maximum permissible limits set by the SanPiN RK No. 3.03.015-97. Emissions toxicity reduction measures in the road rehabilitation and operation within the project that is under development are recommended to include the following works:

- Ensuring proper maintenance of the construction machinery and equipment in accordance with manufacturers recommendations and its repair in accordance with manufacturers recommendations;
- Systematic control over the technical state of fuel equipment of diesel engines, the exhaust gases of which contain significant amounts of soot;
- Ensuring equal operation rhythm for pacing mechanisms, sealing equipment and transport vehicles that are used in construction of pavements with hot mixes, which contributes to prevention of impermissible concentrations of pollutants (e.g., aliphatic and aromatic hydrocarbons, including carcinogenic benzapyrene, PAH) in the working area and the surrounding areas.
- Due to the fact that there are no natural protected areas near the road, there is no need to limit the works at night time or in placement of construction depot sand construction camps in locations that will not have an impact on residential areas
- Regular monitoring of atmosphere air pollution must be carried out throughout the construction period to ensure control and apply mitigation measures for settlements and workers who are involved in the construction, if necessary
- Dust and gas pollution control in the working area (concrete plants, stone crushers, areas with heavy dust formation and work with bitumen and other aggressive substances). Protective measures for people working in these areas.

Mitigation Measures during the Operation Period

- Improving the road design. Reduction of the longitudinal profile, improvement of visibility, increase in the radius to ensure high-speed driving and reduction of toxic emissions (these requirements are incorporated into the design of this road).
- Ensuring longitudinal slopes of the road surface in the project that do not exceed 10% of the radius of curve and compliance of the road with high requirements, evenness and smoothness of the roadbed leads to significant reduction in toxic emissions. These requirements were incorporated into the design of the proposed road design.

- Signing, markings, fencing will ensure non-stop traffic and reduce the % of emissions in the exhaust gases (EG) of vehicles. These requirements were included in the proposed road design;
- Recent legislation has established the requirement for every motor vehicle to be inspected once per year for technical functionality, taking into account emissions standards. The technical inspection certificate has to be kept in a vehicle and might be checked by road police during routine traffic controls.
- Use of unleaded fuel is increasing in Kazakhstan, and this allows significantly reducing lead emissions into the environment.
- Regular monitoring of atmosphere air pollution should be carried out throughout the operation period to ensure absence of impacts on settlements and workers who are involved in the construction.

Dust Mitigation Measures during Construction and Operation Periods

Dust can be a major problem during construction; it is caused by a range of preparation and construction activities, including site preparation where the soil is disturbed, during transportation of crushed stone and cement for concrete production, during transportation of construction materials, particularly, cement, and generally on unpaved road surfaces.

To reduce dust pollution for the environment during construction and maintenance works on the road, the following activities should be carried out:

- Maintaining, cleaning and watering of road sections with intensive dust formation.
- Periodic watering of dirt roads at a rate of 2 l/m^2 per watering cycle;
- Traffic speed limiting for the road sections that are subject to intense dust formation;
- Ensure transportation of all potentially dusty materials in the transport facilities equipped with tarpaulin or other covers, or materials storage in protected sacks.

7.2 Borrow Pits Impact Mitigation Measures

Quarries which have been determined during the Consultant visit and will be identified during detailed project preparation (in order to reduce impacts associated with quarry and borrow pits activities, contract documents will specify only licensed quarry exploitation to be used as a material source). If licensed quarries are not available, contractors will be responsible for establishment of dedicated crusher plants in the quarry territories approved by the MID. Further, contractors who are supplying and purchasing construction materials will ensure availability of appropriate environmental permits, as well as its obtaining, if unavailable, from the competent authority before sourcing the material for all quarries, according to the Environmental Code of the RK.

The contractors will be obliged to prepare a plan to identify the sources of material that will be used for the earth fillings. The plan will be agreed with the engineer for construction works supervision and submitted to the MID, which ensures that the plan is implemented. The plan for materials should show the location of any borrow pits to be used and the measures to be taken to rehabilitate these pits upon the project completion. The MID will approve and monitor implementation of the plan.

Prior to construction activities, the Contractor shall also prepare plan for quarry exploitation, indicating the quarry, access and exit roads, proposed area of material production and geological cross-section profile.

However, no quarry shall be located within 500 m from any built-up or natural protected territory. In addition, the Contractors should ensure that quarries and crusher plants are:

- located at least 500 meters from residential areas to prevent noise and dust impacts;
- located outside of agricultural land; and
- located on state-owned lands, where possible.

Practices for material extraction, storage and transportation recommended for use are given below:

- Top soil must be stored separately, covered and used for planting of the borrow pit area or slopes at the construction sites after construction works completion
- Material has to be excavated only in the designated areas in cooperation with Construction Supervision Consultant (CSC)
- Material has to be stored in the designated areas in coordination with CSC
- Heaps should not be stored in the vicinity of open water courses to prevent clogging or obstruction of waterways
- The Contractor has to moisten unpaved routes which go next to settlements to suppress dust pollution in materials transportation from borrow pits
- Fine material (sand) has to be covered with tarpaulin to prevent dust generation and dirtying of transport roads

To mitigate the adverse impacts on the quarries and borrow pits environment, in addition to the preparation of materials and plan, it is recommended that the contract documents specify that: (i) quarries will be restored in full compliance with all applicable standards and specifications upon the completion of works; (ii) procedure for opening and use of quarries materials will contain provisions that will be obligatory for execution by the contractors; (iii) quarries excavation and restoration, as well as its surrounding areas is carried out in environmentally sound manner, complying with the requirements of the Construction Supervision Consultant (CSC) until the final works acceptance and payment provision in accordance with the contracts' terms and conditions; (iv) topsoil from borrow pit areas will be maintained and reused to create afforestation in the quarries areas in accordance with the PMC requirements. Extraction of construction material from the riverbed should be avoided to prevent erosion and destruction of the river banks infrastructure (roads, settlements).

7.3 Noise and Vibration Level Mitigation Measures

The level of traffic noise generated by vehicles traveling on the highway shall not exceed the values set out by SanPiN of Republic of Kazakhstan No. 841 dated 03.12.2004, that is 70 dBA.

Noise Level Mitigation Measures during the Construction Period

The noise level is high when driving vehicles on the road, as well as road construction machinery and mechanisms used in the road reconstruction and construction. There is especially a lot of noise generated by bulldozers, scrapers, pneumatic hammers, vibrators, cutters.

Transport noise level reduction is achieved through the following activities:

- Imposing traffic speed limit during construction period to 60 km/h can lead to reduction of noise by 7 dBA (as compared to 80 km/h);
- Maintenance works during the daytime to reduce any potential impact on construction area;
- Soundproofing for all engines of vehicles by the use of protective covers made of foam rubber, rubber and other soundproofing materials, as well as by the use of hoods with multilayer coatings; ensuring either that the Contractor uses modern equipment that complies with noise level reduction standards, or that the equipment is equipped to meet the required standards;
- Placement of non-mobile units (compressors) must be carried out in sound-absorbing areas or tents that reduce the noise level by up to 70%.
- In road construction works implementation, areas with high sound levels above 80 dBA must be designated with safety signs, and workers in this area should be provided with personal protective means (earplugs or ear protectors).
- All depots, special working areas, batching or mixing plants should be located at a distance from residential areas and specially protected natural areas
- Due to the fact that natural protected areas, wildlife preserves are located far away from the road, it would not be necessary to limit the works at night or locate the construction depot sand camps
- Regular monitoring of noise levels near natural protected areas must be carried out to make sure that there are no impacts on residents and workers involved in the construction

Noise Level Mitigation Measures during Operation

Calculation of noise during the operation period indicates that traffic noise does not exceed the maximum permissible levels at any sections of the road. It is necessary to monitor noise levels on a regular basis to ensure absence of potential impact.

Vibration Level Mitigation Measures

Vibration normally occurs when piling takes place. This may occur in a number of locations, mainly during bridges construction. If it does not occur near residential areas, then impact on the community will be minimal. Impact will affect workers in the construction site. All the workers exposed to vibration impact should be provided with special clothing, earplugs and regular breaks.

7.4 Water Bodies Impact Mitigation Measures

Construction

Overall, there is a low impact level expected on ground and surface water. The impact on ground water is likely to be minimal and pollution is unlikely. Embankments will have sufficient number of culverts to prevent damming of surface runoff and subsequent water logging.

During road construction, it is necessary to carry out regular monitoring in order to control and prevent pollution of watercourses.

The working draft will include developed road drainage system, which will consist of a series of structures and individual structural measures intended to prevent water logging and flooding of the road, as well as to intercept and divert water coming to the roadbed. Discharge facilities are ar-

ranged at the intersections of the road with watercourses, waterless valleys, irrigation canals and discharge canals.

Despite the fact that the drainage system project will be implemented in accordance with best engineering practice, some local problems and defects can be detected during or after completion of construction. Any deficiencies should be eliminated at early stages, and monitoring of drainage system shall be carried out during the operation period.

Discharge of Waste Water from the Construction Camp

Discharge of wastewater to watercourses is only allowed with the permission from sanitary and epidemiological service and fisheries; at the same time, composition of wastewater must comply with requirements of SanPiN No.3.02.002.04 for protection of surface water from pollution.

Surface and Ground Water Protection

In order to prevent negative impacts on water bodies, water protection zone is established for a river. Dimensions of the water protection zone on each side from the middle summer-period bank line for small rivers (up to 200 km length) is 300 m; for the rest of the rivers:

- with simple conditions for household use and favorable environmental conditions in the catchment area - 500 m;
- with complex conditions of household use and intense environmental conditions in the catchment area - 1000 m.

In water protection zones of rivers, pollution of the earth's surface, especially landfills, waste production, as well as parking, fueling, washing and repair of motor vehicles and road equipment is prohibited. The perpetrators are liable in accordance with legislation for pollution and contamination of waters, structures commissioning works without devices to prevent pollution and contamination of waters, wasteful water use, violation of water protection regime in catchment areas and other violations.

According to the Instructions for Approval and Issuance of Permits for Special Water Use in the Republic of Kazakhstan, the Contractor should get a permit for water use during the road reconstruction.

Works within the water-protection zone can be allowed with special permit issued by the territorial departments of the Committee for Water Resources of the Ministry of Agriculture of the RK.

Specific Mitigation Measures during Construction should include:

Local representatives of the CfR, regional departments of the Committee for Water Resources and akimats in consultation with the Contractors must ensure that water withdrawal is carried out from the existing wells (for construction activities) and from water supply systems (for household needs of the camps, etc.). The contractor shall be responsible for obtaining all permits from akimats and competent authorities required for use of surface and ground water. No water shall be used without special water use permit.

- Good management of all construction sites to prevent flooding.
- Good management of all construction sites to prevent water pollution.
- All surface water courses within the project must be protected by settling ponds and filters.

- Waste water from construction camps must be treated on the site before discharge into surface rivers;
- Washout from toilets must be exported to offsite treatment plants.

Operation period

In traffic, a large amount of harmful substance is generated: heavy metals from combustion of fuel, carcinogenic dust from tires, oil products, deicing salts which are washed with sediments from the roadbed, polluting soil, water bodies and watercourses. Petrol stations, technical service and inspection stations, car wash that are located in the roadside are especially highly polluting the environment by various oil products and cleansing fluids.

During the operation period, the project provides drainage channels and culverts for wastewater discharge from the roadway outside watercourses. The water from the roadway of bridges comes to curbs of pavement blocks and further drained to drainage gutters at the beginning and end of the bridge due to longitudinal slope along the curbs, and then goes to the water intake wells where filtration occurs.

To exclude the pollutants from the roadway of the bridge, the project provides pavement curbs of monolithic concrete along the entire length of the bridge. Rain water on the pedestrian part of the bridge that is protected from harmful toxic substances from the roadway of the bridge by a solid curb is not a threat to the ecosystem. On small shabby bridges located on small watercourses polluted water from the roadway of bridges in the watercourse is also excluded due to the continuous curb fencing.

7.5 Soil Erosion and Pollution Prevention Measures

Construction period

During the construction period, it is essential that the Contractor has taken all measures in accordance with the contract specifications, managed all activities at the site, taking into account the environment preservation.

During the construction of the road, the number of priority works should include elimination of sources of erosion and elimination of the causes of its occurrence. Due to the characteristics of the landscape and design solutions, erosion and landslides are unlikely to occur even in extremely dry or humid conditions. However, all construction works should be carried out with the prevention of erosion.

In order not to pollute the soil, it is necessary to carry out the following activities:

- Ensure proper management of construction activities, so that there will be no leaks of oils and other substances; if it happens, it is necessary to take immediate measures to minimize the impact on the soil.
- Store construction materials only in specially designated areas;
- Prompt sorting and removal of construction waste in specially designated areas;
- Cover sites after the open excavation with the fertile layer to prevent pollution of the lower soil layers.

Reclaiming after Competition of the Construction

The road construction will require temporary use of land for the construction period, and according to the legislation, these land plots must be reclaimed and returned to the original users and owners in a condition suitable for its original use. Any use of land that involves removal of any fertile soil layer results in disturbance to the local environment and general ecosystem. Therefore, it is essential to preserve the natural landscape and the existing vegetation.

According to the Land Code of the Republic of Kazakhstan dated 20.06.2003 and "Instructions for Assessment of Proposed Economic and Other Activities on the Environment in Developing Pre-Planning, Planning, Pre-Design and Design Documentation", Astana, 2007, all land plots used shall be returned in a condition suitable for agricultural activities.

Biological reclaiming stage for the disturbed land plots provides agro technical measures to restore fertility of the disturbed land plots. In production of biological reclaiming for the disturbed land plots, sowing of reclaiming herbs for soil fertility and structure restoration is provided. Land reclaiming should be carried out during or after completion of the construction activities. It is especially important to reclaim in areas where soil has been disturbed in construction period and associated activities.

Restoration measures to reduce soil losses and erosion during construction include the following:

- Removal of sand and crushed stone mixture (20 cm) from the surface of the road with a bulldozer moving into piles up to 50m, followed by loading with an excavator of 0.65 m2 to dump trucks with transportation of up to 1 km (35 000 x 0.20);
- Planning of the road surface by bulldozer;
- Deep subsoil loosening by bulldozer;
- Backward sliding of fertile topsoil from the dump trucks to the prepared surface layer by the bulldozer

Activities on the site after construction completion should include the following:

- Presuming soil treatment with cultivator;
- Mechanized sowing of perennial grasses as follows: alfalfa - 25% from 18 kg/ha +30%; perennial ryegrass - 75% from 35 kg/ha +30%.
- After sowing soil surface packing by a star-wheeled roller

The best perennial grasses in the road alignment area are blue bunch wheatgrass and sailfin. Wheatgrass is a perennial loose-bunch grasses that has a high resistance to drought. Sailfin is a perennial valuable drought-resistant and winter-hardy legumes crop that is sown in wide rows with row-spacing ranging from 30-60 cm. It is planted mainly in the early spring periods. The green mass is eaten by cattle, and also provides excellent hay.

Immediate and proper reclamation of land will ensure reduction in impacts from the disturbed land plots on the environment components; it will reduce dust and pollutants generation, will have a beneficial impact on human health and eliminate environmental damage.

Operation period

During operation, it is necessary to minimize pollution. All liquid wastes of any kind must be removed from the road and disposed of in any designated areas. An agency that controls state of roads is responsible for ensuring quick and complete cleaning of the road from waste, as well as surrounding territories.

7.6 Flora and Fauna Impact Mitigation Measures

Air pollution, noise and vibration, possible flooding and wind, water erosion usually has negative impacts on the environment.

All the above-specified measures for mitigation of negative impact of emissions from vehicles, noise and vibration effects are directly related to the flora and fauna. To reduce the negative impact on flora and fauna during the road construction, it is necessary to meet the following environmental protection measures:

- Ensuring proper operating condition of the road surface throughout the operation period to minimize noise and air pollution which has adverse impacts on flora and fauna;
- Reducing use of salts and chemical materials to disperse snow and ice in winter period, so that soils, plants, animals and birds are not adversely affected. An alternative for salt and other chemicals replacement can be friction materials such as sand or gravel;
- Use of de-icing materials that are less toxic to the environment, including CCF-type materials (calcium chloride, inhibited phosphate) or CMA-type materials (calcium magnesium acetate), which do not lead to irreversible changes in photosynthesis and subsequent destruction of plant tissues and animal deaths;
- Reducing dust pollution may occur in good maintenance of the road, regular cleaning and watering for reduction of negative effect on vegetation.

In addition, all vehicles and cargo transportation means, including construction machinery, should be covered with tarpaulins or other suitable covers.

Temporary and continuous flooding or overflow can be avoided with the help of culverts and drainage system to avoid impact on flora and fauna.

Felling of trees and planting of new trees is not provided by this project.

The filtration capacity of the green zone is observed not only with respect to dust, but also reduces the noise impact of motorways. Green plants contribute to the enrichment of air with oxygen. Landscaping helps in dealing with soil erosion and losses in the section.

Compensatory measures include planting of at least the same number of trees and additional provision for non-germinated seedlings. These landscaping activities are provided in a separate contract and will not be a part of the contract for the roads construction.

Specific Mitigation Measures for Fauna:

As a result of meeting of designer engineers with local residents as required in accordance with applicable regulatory requirements of the Republic of Kazakhstan, cattle droves will be built. Detailed information on cattle droves will be available after the completion of the detailed design for all sections and it will be described in the RAP.

The Contractor shall ensure that no excessive and/or unnecessary disturbance to fauna within or close to the alignment takes place. Hunting by the Contractor's personnel will be forbidden in the project area. The Contractor and Supervision Engineers will strictly enforce these requirements.

7.7 Social and Economic Impact Mitigation Measures

Local Business

The road development may have some impact on the economic activities of the local communities on the existing road alignment. Alongside the present road, there are various permanent and temporary commercial activities, including restaurants, mini-stores, car repair establishments and temporary stalls selling local fruits, vegetables and other local products. These businesses rely on the passing traffic for their customers. With the construction of the new alignment, some of the businesses may lose some, though clearly not all, of the passing customers. It is likely that much of the existing trade will not be lost when the new road is constructed, although it is impossible to make any definite predictions. There is no World Bank or domestic policy requirements to compensate persons indirectly affected in this manner. During the recent consultation processes, any member of the community or the district administration did not raise this issue.

However, there are a number of approaches that would provide opportunities for the local community adversely impacted by the road development. Three approaches are proposed below:

- Providing sites for local businesses and farmers to sell their products to travelers using the new road. It is recommended that the design includes sites for local farmers and businesses as a means to ensure that the local community can benefit from the new road and as a means of compensation for potential losses to the current business on the existing road.
- Good signing on the new road and at junctions to show the location of the nearest petrol station, shops, market, restaurants, etc. located along the road. This will enable users of the new road to improve commercial activities on the earlier existing road location.
- After the road construction completion and prior to opening of the service/rest areas, it is necessary to allow small traders to locate at vacant sites at some transport intersections. It must be carried out in accordance with road safety regulations and should only occur at specific approved sites where space is available for road access for parking and good visibility is provided. Signs informing roads users of these locations should be incorporated into the proposed road signage.

Livestock Droves

During the first public hearings, many farmers were concerned about ensuring that sufficient livestock droves and farm machinery crossing points were included in the design. This is particularly important in locations where farmer's land is along both sides of the road. But it is also an issue where the road blocks traditional routes for farmers moving livestock and machinery. As the result of public hearings, crossing points for livestock and agricultural machinery will be included in the design as necessary. It is preferably that the decisions on location of any additional cattle droves are made prior to the construction works.

Land acquisition mitigation aspects will be described in the Resettlement Action Plan, but it is important to stress out that the expected land acquisition is to be completed as soon as possible in accordance with Government procedures and the Resettlement Action Plan. All objections and complaints should be regulated in accordance with the Grievance Redress Mechanism included in the RIR for the completion of land acquisition within the construction period.

Potential Bypasses

There are a number of potential bypasses possible to be constructed in Karaganda-Burylbaital section. The first of these is Kurma village, which is located at a distance of 9.7 km from the city of

Karaganda. Significant role in the rural economy is played by a poultry farm. Below, the figure on the right shows the entrance to "Kurma" LLP farm. During public hearings in June, the public was divided into 2 groups, and one of it was represented by people who wanted to have the same road as the existing one, but representatives of the other group were people who required bypass of the village. The issues that have been raised during the public hearings are reflected in the minutes of the public hearings they are attached in appendixes. Public hearings were held in order to inform the local community about the project; further public hearings will be carried out by design engineers to determine the bypasses, the exact locations for cattle droves and bridges.

Figure 7.7.1 Kurma village located 9.7 km away from Karaganda; bypass for "Kurma" farm may be required

Abay District ends at km 1547.3 and Shet District begins, where administrative center is the village of Aksu Ayuly. Below is a photo of Aksu Ayuly village. There is also a potential bypass. However, at the public hearings, local residents have expressed that they would not like to have the road far from the village

Figure 7.7.2. Potential bypass for Aksu Ayuly village, 1 547 km.

Another potential bypass may be required for Aksu village, which is located at 1 577 km. During the public hearings held on June 18, 2015, Akim and local residents expressed that they would not like to have the road far from the village, as this might adversely affect their businesses, and they also added that they have concerns about access to the road in case of village bypassing. Detailed information is written in the minutes of the public hearings.

Fig. 7.7.3. Bypass for Aksu village at 1 577 km.

Balkhash is a major important industrial town of Karaganda Oblast located at 1 853 km of the road. Currently, the road bypasses the town. However, the existing bypass may not be sufficient enough for the 1st category road, and several design solutions are under review now. There are quite many roadside services facilities near the road, such as cafes, stores, etc. Below is a photo of the town taken from the road view.

Fig. 7.7.4 View of the town of Balkhash; the photo has been taken from the road view. Several by-passes are required.

Saryshagan village is located at 1 990.8 km, and it has been determined that a bypass is required there. The village is located between Balkhash Lake and railroad, and during public hearings, local residents expressed that the village has already been suffering from road accidents and bypass is needed. Questions and suggestions of local residents are described in the minutes of public hearing that are attached in appendixes. The designer engineer jointly with other road authorities will hold a scientific-technical council to discuss and approve the proposed options for the bypass. Below are photos on entrance to the village. Seasonal fish selling is a regular issue in Saryshagan. It is also reflected on the figure below.

Fig. 7.7.5: A bypass is required at 1 990.8 km near Saryshagan village

The design engineers together with other road authorities will carry out comprehensive analysis of the proposed options for bypasses and will take appropriate decision.

7.8 Physical Cultural Resources Impact Mitigation Measures

All the historical sites and memorials found in the pre- archaeological inspection of the sites of the planned passage of the highway will be protected in order to provide protection during the works and memorials will be moved in coordination with local authorities. During the design and implementation of the project, quarries should be offered and chosen based on the location of objects and they should be located at a distance of 200 m from the cultural objects.

It is forbidden to carry out all types of work that may pose a threat to the existence of historical and cultural heritage

For any PCR that are discovered during the construction works “chance find” procedures shall apply procedures described in paragraph 2 of Article 39 of the “Law on Protection and Use of Historical and Cultural Heritage in the Republic of Kazakhstan” which stipulates: "*In case of detection of objects of historical, scientific, artistic, and other cultural value, physical and legal persons are obliged to suspend the further conduct of the work and inform the authorized body*".

However, the law on "Protection and use of historical and cultural heritage of the Republic of Kazakhstan" does not regulate the timing of the research work. The term of the research work is defined by the expert on each individual object, depending on the size and scope of work. Archeological report and procedure of actions during the "accidental finding" of cultural objects are given in Annex 2. A detailed management plan on the Karaganda-Burylbaital road section will be developed upon completion of the design project of all fourteen (14) sections of the project road.

7.9 Road Safety and Aesthetics Measures

Road Safety

Design of the new route with limited access, with a dividing strip will be carried out with the introduction of safety requirements that are absent on the existing road. There are a number of engineering and organizational measures that are available to slow the movement of motor vehicles and improve road safety for pedestrians, animals, transport of animals and cyclists. This includes road signs, and monitoring of compliance with the high-speed traffic speed cameras; pedestrian crossings

with traffic lights, if necessary; rumble strips and speed bumps to reduce speed; light signals to warn drivers of crossings or non-motorized road users. Design already includes a number of these measures, the final volume, locations and sites will be determined in consultation with the people concerned before the commencement of construction. Design of proposed road includes the following:

- Divided carriageways;
- Limited access and exit;
- Multi- level interchanges at busy junctions;
- Good horizontal and vertical profiles and visibility;
- Clear and consistent road markings;
- Absence of pedestrians and non-motorized vehicles;
- Emergency brake lanes and emergency parking areas;
- Good lighting at key intersections and other locations;
- Clear warning and information signs;
- Safety barriers in accordance with international standards, at junctions, high embankments and cuttings;
- Trucks should not be overloaded to prevent road accidents.

It is necessary to ensure appropriate warning and information signs, lighting and safe crossing for pedestrians and non-motorized traffic at junctions and access roads to the proposed road. It is recommended specifically to stipulate in the design speed cameras at intersections connected to a central control area, rumble strips prior to junctions and at other locations to warn drivers of junctions and necessity of slow down the speed.

Pedestrian Crossing Points

Pedestrian crossing points at places of frequent movement of pedestrians shall be provided in the design, if necessary. Pedestrian crossing should include white (zebra) strips on the carriageway, signs and advance warning signs.

Aesthetics

The objective of aesthetics is to ensure a high quality of design, construction and operation to improve the landscape and esthetic quality of the territory. This can be done through the following design and operation requirements:

- Greening with trees and plants, which are characteristic and suitable for severe climatic conditions of Kazakhstan and landscape works will be carried out as required;
- The design of the road and its construction should be of the highest quality taking into account local landscape characteristics and features;
- Ensure that all non-operational land is planted and landscaped to the highest level with trees and vegetation that are endemic and suitable for the severe Kazakhstan climatic conditions
- Ensuring the all warning signs, kilometers signs and all other road furniture is designed as a whole and are compatible with the landscape features of the area.
- To follow existing contours so reducing the need for visually obtrusive deep cuttings and embankments:

This will be operational requirements for the road operators.

7.10 Wastes Minimization

Wastes during the Construction Period

Inert materials, such as ground material, sand and gravel, concrete, crushed stone, which should be recycled and used as a building material for filling, forming and creating an artificial landscape. These types of waste will be disposed in accordance with sanitary regulations and the Environmental Code of the Republic of Kazakhstan. Timber from felled trees and other organic materials from the clearing of land for construction should be collected and stored in special places outside the construction zone; it can also be sold to the people as firewood.

The project of preparatory work should provide special places for temporary storage of waste, indicating the methods and the ways of its removal to the place of burial, processing or trading. Export of wood and waste from clearing of vegetation should be carried out during the season of felling and winch works (preferably in the winter).

Contractors shall provide containers for all construction waste and should be separated; metals, plastics and construction materials. Any waste and scrap that may be recycled or reused should be separated and stored or taken off site as necessary. Waste materials for recycling and reusing within the construction site should be clearly marked and separated. In all cases storage must take place in clearly marked areas and taken off site as soon as practical. The Waste Management consultation shall be carried out under all waste maters. It must be the responsibility of the Contractor to dispose of all waste and to do so in accordance with local and national regulations. Any hazardous waste must be disposed of in accordance with local and national regulations. Disposal of any waste on adjacent sites with or without the land owner's permission, outside the construction site perimeter is not permitted unless the sites are approved waste disposal sites. Burning of any waste is forbidden.

All waste from the workers camps and offices will be regularly taken by the contractor to the nearest approved waste disposal site. Municipal solid waste will be transported to the landfill of MSW

Construction waste in the form of the electrode stubs, metal fittings and pipes will be given to specialized companies for receiving of such wastes. Unauthorized incineration at the construction site is forbidden. Temporary collection points will be provided within the site for all general waste and these will be clearly signed and will be collected regularly.

At the completion of the construction works, all wastes including temporary structures and installations and all unused materials shall be taken off site. No waste should be left on any part of the construction site.

Wastes during the Operation Period

Waste generated during operation period will mainly be gravel and salt remnants from winter maintenance, sludge from settling ponds, asphalt, concrete and gravel from repair and maintenance works. None of these wastes are hazardous and may be disposed within the existing municipal waste management program, or may be used as construction material (gravel, crushed stone) or recycling material (cement and asphalt). The annual quantities will fluctuate depending on weather conditions (duration and severity of winter conditions) and volume of maintenance works. The range is expected to vary between a few hundreds to a few thousands of m^3 per annum.

Control over the waste disposal is under responsibility of Akimat. The operator will agree prior on waste maintenance for disposal to landfills. Disposal of waste to other places must be agreed with district Akimat. Any hazardous or medical waste is disposed separately to the approved disposal sites. The operator is responsible for all waste collection within the road territory and service areas and disposal to the approved and agreed sites. No disposal will take place in the alignment or service areas. Waste incineration is prohibited in the road or service areas, unless it is allowed in accordance with local and national regulations.

The issue of livestock droves and crossing points for agricultural machinery has been also covered in the RAP.

7.11 Road Access and Traffic Impact Mitigation Measures

The project will cause temporary impacts on local access and traffic in rehabilitation areas during the construction period due to bypasses and traffic inconveniences, and local roads could be damaged during transportation of construction materials or construction equipment, or by abnormal amounts of public traffic, and this issue was raised during public hearings. Mitigation of the foregoing impacts will include:

- Contracts will contain a condition specifying measures should be taken during the construction period to ensure that disruptions to traffic on the road are minimized. The Contractor shall ensure that the roads remain open for traffic during construction activities;
- The Contractor will prepare a traffic control plan to be approved by the Project Supervision Consultant. The plan will include routes, traffic control devices, temporary fencing, barriers, bypasses, traffic signs and speed limits, and safe passage for pedestrians;
- Prior to construction activities, the Contractor will install all signs, barriers and control devices necessary to ensure safe use of the road for traffic and pedestrians in accordance with the traffic control plan;
- Signs, crossing points and other appropriate safety functions will be incorporated at railroad and road crossings;
- Prior to arrangement of bypasses and any changes, local authorities and residents of the project area will be consulted;
- Footpaths and roads will be kept free of debris and other materials during the construction period;
- Disposal sites and routes will be identified and coordinated with local authorities; and
- Construction machinery will use temporary roads built for that purpose to minimize damage on agricultural land and local access roads. Where local roads are used, it will be recovered to the initial state after the works completion.

8 INSTITUTIONAL REQUIREMENTS

The following section presents a description of the environmental management activities that will be undertaken as part of overall project implementation. The roles and responsibilities of various organizations in carrying out these activities are defined and the institutional strengthening activities that are required to allow those organizations to achieve their nominated roles and responsibilities are determined.

An environmental monitoring program will be prepared and the expenditures, associated with its implementation will be included in the Civil Works Contracts and consultancy supervision service project.

8.1 Organizations Involved in Project

The institutions to be involved in the environmental management of the project are the following:

- Government of Republic of Kazakhstan(RK)
- Ministry of Investment and Development (MID)
- Committee for Roads(CfR)
- International Bank for Reconstruction and Development (IBRD)
- Committee of Environmental Protection of the Ministry of Energy of RK
- «KazAvtoZhol NC» JSC – National Operator responsible for management of republican roads
- «KazakhAutoDor» RSE - Enterprise on roads operation and maintenance
- Project Management Consultant (PMC)
- Construction Supervision Consultant (CSC)
- PMC – Environmental staff
- Contractor
- Regional and local administration
- Affected communities

8.2 Institutional Obligations

MID will bears responsibility for preparation, implementation and financing of environmental management and monitoring tasks as they pertain to the project. MID will implement its functions through PMC which will be responsible for general project execution, and which will be tasked with day-to-day project management activities, as well as monitoring.

Specialist staff will be assigned to the PMC to perform all tasks related to environmental assessment. The PMC environment staff will be supported by the CSC (Construction Supervision Consultant). The CSC's team is necessary to provide an environmental monitoring specialist and social impact monitoring specialist. At the present time there are no permanent workers in the PMC, assigned to environmental assessment, management or monitoring. Such tasks will be implemented on each project basis by Consultants.

At the implementation of environmental management and monitoring tasks specific technical assistance will be provided by:

- Environmental specialists, who are a part of supervision consultant's and all included into project contracting organizations team. The specialists will assist in all aspects of environmental planning and implementation, internal monitoring and evaluation (M&E) and training of PMC staff and relevant government establishment on environmental assessment and World Bank's Environment Policy questions;

- An independent monitoring agency (IMA) could be hired to (I) conduct periodic monitoring and evaluation, (II) check implementation of the IEE and EMP activities by third person, and (III) to ensure that all the identified adverse effects at this moment have been mitigated.

The consultation with Committee of Environmental Protection (CEP) under the Ministry of Energy of RK will be conducted during the feasibility study preparation and detailed designing and also it will be required to confirm the project category. The CEP will be suggested to review the EIA and confirm the project for its environmental importance. Ongoing consultation with CEP will be required during the implementation of the project.

The rural communities and village leaders and organizations will assist in arranging meetings and submit information about affected communities and environmental impacts. An account of the process will be an integral part of the internal monitoring, prepared by PMC.

Responsibilities for the implementation of the monitoring requirements of this EIA are shown in Table 9.1 and Table 9.2 in accordance with the Environmental Management Plan, Monitoring and Institutional Responsibility of Chapter 9.

Implementation of mitigation measures during the construction stage will be the responsibility of the Contractor in compliance with the contract specifications and loan requirements. The Environmental specialists of project supervision consultant will supervise the monitoring of implementing of mitigation measures during the construction stage. The local ecologist will coordinate together with the international environmental specialist for resolving complicated issues that arise in this field and provide continuously updated information in order to submit reports to PMC and WB.

After project completion, MID will be in charge of the operation and maintenance of the roads. PMC in cooperation with the district/regional administrations will conduct regular and occasional monitoring and sample analysis in CEP's analytical control laboratory in Astana as scheduled in the monitoring plan.

Conduction of periodic environmental monitoring of fauna after road construction completion is recommended. It is desirable that work acceptance after completion should include a full examination of the contractor's compliance with the specified requirements for the protection of the environment. This should include verification of the proper clean-up and restoration of all temporary work sites (quarries, camps, etc.) and of the proper landscaping, planting and draining of all borrow pits and spoil areas.

In the longer term, it is essential that the authorized bodies of road maintenance monitor the effectiveness of the erosion protection measures. Some forms of reporting should be implemented to ensure that information regarding defects in design or construction methods is fed back to the centre and to the Road Maintenance Units.

Carrying out by CSC periodic assessments of the fatality rate of livestock and migratory herds and migratory animals especially at new alignments if it is necessity to build due to traffic impact is also recommended. Corrective measures should be taken if the frequency of such occurrences increases significantly. The different phases of the implementation of the EIA on separate road sites are as follows:
a) Planning of the road project with special account being taken of:

- areas with large excavations (cuttings) and embankments, and quarries for construction materials,
- soil reserves for embankments and dumping areas for spoil,
- storage areas for toxic waste and garbage,
- locations of temporary concrete plants and other material processing plants,
- contractors' camps,
- sources of water for construction purposes,
- temporary access roads and other temporary constructions,

(b). Obtain written agreement from local administrative authorities concerning spoil dumps, burial of garbage, contaminated soils and toxic substances.

(c). Obtain written permits (from local authorities, representatives of the environmental protection authority and sanitary inspector) concerning permanent and temporary land acquisition for road construction, quarries, spoil dumps, contractors' camps, concrete plants and other materials processing plants.

(d). Agreement of any changes with local institutions, responsible for irrigation system, if they are affected by the project.

(e). Agreement of the planning requirements for bridges and other structures in rivers or other water bodies with the agencies responsible for fisheries and the local representatives of the environmental protection authorities.

(f). Monitor (by measurement) emissions to the atmosphere and discharges into the ground during construction.

(g). Monitor (by measurement) vehicle emissions during the operation of the road.

(h). Monitor (by measurement) noise levels in towns and other settlements during construction, and the subsequent operation of the road.

(i). Monitor effects of construction-related vibrations, contractor to be responsible for any avoidable damage caused by himself. Contractors who do not comply with the legislative requirements must be held responsible for the violations and required to compensate for any damages caused.

After EIA document confirmation, a copy of confirmation and a summary of the document will be sent to all relevant communities and villages. Information regarding the approved project and the proposed environmental management measures will be posted in appropriate locations on the project site.

9 ENVIRONMENTAL MANAGEMENT, MONITORING PLAN AND INSTITUTIONAL RESPONSIBILITY

9.1 Environmental Monitoring Plan

Environmental monitoring is a very important aspect of the environment management during the project implementation and operation to ensure safeguard for the environment. During construction, landslide monitoring, side slope monitoring and embankment monitoring will be conducted for the purpose of timely prevention of potential erosion. Borrow pits restoration, quarry activities, material storages, and locations of asphalt plants, community relations, and safety provisions are described within the Environmental Management Plan (EMP).

In response to the environmental impacts identified during the study, an environmental monitoring plan has been developed and is presented in Table 9.1 and Table 9.2. The contract documents will contain a list of all required mitigation measures and a timeframe for the compliance monitoring of these activities. The monitoring will include supervision to check the Contractor's execution of Contract provisions during construction period.

The construction supervision consultant (CSC) in cooperation with MID during project implementation will be required to:

- The Contractor will develop appropriate EMP. The CSC will use this monitoring plan as a basis for supervision of the Contractor's compliance with these EMP.
- Regular control for environment monitoring conducting, and submission of quarterly reports: the main parameters to be monitored are outlined in Table 9.1 and 9.2. The CSC will provide an Environmental Specialist as part of the CSC team.
- Regular control of the subproject roads, and submission of quarterly reports based on the monitoring data and laboratory analysis report. The Contractor and the Supervision engineer will be responsible for data collection for environmental monitoring.

A lump sum budget is allocated to cover monitoring cost during construction phase of the project. CR/PMC will hire a consultant for environmental monitoring and ensure that the road is monitored regularly during construction works.

The following measures will be taken to provide an environmental compliance monitoring program during project implementation:

The tender and contract documents will clearly determinate the contractor's obligations to undertake the environmental mitigation measures as set out in chapter 7 of this EIA and which shall be stipulated as enclosure to specifications;

The recommended environmental mitigation cost should be included as an item in the Bills of Quantities. It will be a guarantee of specific environmental mitigation budget available, which will be conducted as required. During the procurement, Contractors will be encouraged to include these costs in their rates and present the mitigation costs as an item in the Bill of Quantities

During construction, the Construction Supervision Consultant (CSC) in accordance with the Project Management Consultant (PMC) will control over construction, compliance with the requirements of safety, health and environment.

Monitoring Parameters

Regular monitoring of air and water and taking of noise measurements is required to determine whether standards, established by the Environmental Management Plan, are being complied with. This should commence before construction to provide a baseline against which data collected during construction can be compared.

Chemical measurements shall be conducted by a recognized laboratory and in-situ measurements shall be made under the supervision suitably qualified person from a laboratory.

Monitoring should provide information on whether standards are being complied with and sensitive sections of environment protected.

The recommendations for monitoring parameters requirements relating to the direct impact of construction activities during construction phase are presented in Table 9.1.

Monitoring Frequency

The frequency of monitoring inspections depends on the risks posed to the environment by each construction activity or the nature of the site.

The recommendations for monitoring frequency requirements relating to the direct impact during operation phase are presented in Table9.2.

9. ENVIRONMENTAL MANAGEMENT PLAN: MONITORING AND INSTITUTIONAL RESPONSIBILITY: KARAGANDA – BALKHASH – BURYLBAITAL, KURTY- KAPSHAGAY ROAD SECTION

Table 9.1 PROJECT IMPACT DURING CONSTRUCTION, MITIGATION MEASURES, MONITORING AND RESPONSIBILITY

CATEGORY	POTENTIAL IMPACT	SIGNIFICANCE	LOCAL IMPACTS	MITIGATION	RESPONSIBILITY	MONITORING	RESPONSIBILITY	LONG TERM IMPACT
1. Air quality	Air pollution: emissions from construction machinery and equipment, emissions from cement-concrete, asphalt-concrete plants, crushers, etc. Dust: from construction activity borrow pits and crushers transportation of materials	Potentially significant, especially during dry season	Generally in the main area of construction, the existing roads or bypass roads; Potential impact on adjacent villages Local influences on sites in Karaganda, Zhambyl oblasts are not predicted	All vehicles and the equipment used in construction have to be modern, be appropriately maintained and used according to recommendations of manufacturers. All access and bypass roads have to be watered. All plants/dust-generating equipment should be in good repair and be located at distance from all sensitive zones.	The contractor shall bear the responsibility for implementation of mitigation measures. Supervision Engineer monitors the compliance with mitigation plan.	Regular (monthly) monitoring by licensed laboratories at designated sampling points and on-site compliance checks by Construction Supervision Consultant (CSC), Engineer and local environmental protection authorities	Contractors Construction Supervision Consultant (CSC)/Engineer	Long term impact is limited
2. Noise and vibration	Noise from construction machinery and equipment Noise from cement-concrete and asphalt concrete plants, crushers, etc. Transport noise on the access roads	Potentially significant	The area of construction, access and bypass roads. Potential impact on nearby residential areas. Potential impact on the settlements and villages Local impacts on Karaganda, Zhambyl oblast sections are not predicted.	All vehicles and the equipment being in use in construction have to be modern, regularly maintained and used according to recommendations of the manufacturers. All plants/noise making equipment have to be in good repair and locate at distance from settlements. Any types of works during night time near residential areas of the villages/settlements in Karaganda , And Zhambul oblasts should be prohibited.	The contractor shall bear responsibility for implementation of mitigation measures. Supervision Engineer monitors the compliance with mitigation plan.	Regular (monthly) monitoring, implemented by certified laboratory in specified places of selection of tests and Construction Supervision Consultant (CSC), Engineer and local authorities (EP and SES bodies) on-site.	Contractors (through licensed laboratories) Construction Supervision Consultant (CSC)/Engineer	No long term impact

				Speed limit of 60 km/h for all construction equipment shall be enforced.				
3. Water, drainage system and floods	Pollution by a runoff from the construction sites in the areas of bridges construction is possible Infiltration of the polluted water in the water-bearing horizons Pollution of underground waters at pits/quarries (accidental spills) Pollution of surface and underground water sewage from camps.	Influence is from moderate to insignificant. Places of water intakes from wells (drinking water and technical water) will be agreed with Committee on Water Resources. Pollution of underground waters is unlikely as deep soil excavation isn't planned. Pollution from rotational camps can be from moderate to significant	Potential impacts in the area of surface water, located along the alignment (bridge construction). Potentially – all alignment Areas of location of the construction camps	Committee for Roads, Committee on water resources and Akimats of districts in consultation with contractors. The contractor shall provide water intake only from designated sources. Good management at construction sites. Areas of potential pollution of rivers will be designed to prevent accidental spills and runoff and protected by sediment basins. Sewage at construction camps will be collected in septic reservoir and transported/discharged at wastewater treatment plants.	Committee for Roads, Regional Departments of the Committee of water resources (permits for water intakes) and Akimats of districts in consultation with contractors. The contractor shall bear responsibility for implementation of mitigation measures. Construction Supervision Consultant (CSC), Engineer monitors the compliance with mitigation plan.	Regular (monthly) monitoring by licensed laboratories at designated sampling points and on-site compliance checks by Construction Supervision Consultant (CSC), Engineer and Regional office of the Committee on Water Resources implement control on site.	Contractors (through licensed laboratories) Construction Supervision Consultant (CSC), Engineer Committee on water resources	Long-term impacts are possible in case of non-execution of mitigation measures
4. Erosion and pollution of soils and subsoil layers	Soil erosion (wind and water) due to removal of vegetation and topsoil. Pollution of the soil and subsoil layers as a result of construction and accidental spills.	Potential impacts are low to medium (excavation works and operation of borrow pits).	Local impacts are expected only in the areas of borrow pits and earthworks on embankment along the alignment.	All recommended methods on reduction and elimination of an erosion were included in the program of construction Construction methods on reduction or elimination of pollution of soils and subsoil layers. All temporarily used lands have to be restored and returned in an agricultural turnover according to the legislation	The contractor shall bear responsibility for implementation of mitigation measures. Construction Supervision Consultant (CSC), Engineer monitors the compliance with design impact reduction plan.	Contractors Construction Supervision Consultant, the Engineer	Contractors Construction Supervision Consultant (CSC), Engineer the Committee for Roads	Erosion is possible if there is no proper management and prevention during construction.
5. Flora and fauna and the sensitive and protected terri-	Impacts on vegetation along the alignment. Disturbance of fauna in the	Potential impacts are Low to Medium	Moderate loss of planting. Illegal hunting is possi-	Culverts, cattle underpasses and bridges will serve as crossing points for wild animals.	The contractor shall bear the responsibility for implementation of	Regular monitoring of proper vegetation and rational topsoil management shall be car-	Contractors Construction Supervision Consultant	No significant long-term impact on flora and

tories	area of influence of the construction works	Temporary disturbance of birds and animals in the immediate proximity to the construction sites, concrete plants, crushers or borrow pits is possible.	ble	Illegal hunting around the project area will be prohibited.	the mitigation measures. Construction Supervision Consultant (CSC), Engineer shall monitor the compliance with design impact reduction plan.	ried out by the Contractor. Construction Supervision Consultant (CSC), Engineer shall monitor the compliance with design impact reduction plan.	(CSC)/Engineer Local Committee of forest management and wildlife	fauna is expected
6. Social / Economic / Farmers	Land loss/ land acquisition. Possibility of employment during construction Inconvenience for farmers (cattle crossing the road) Loss of trade along the road	Potential impacts are low to moderate Employment opportunities emerge for local population Potential impacts on farmers (animal husbandry)	There are cases of land (open space land) acquisition along the alignment	Land acquisition will be carried out according to the legislation of Kazakhstan and Resettlement Action Plan (RAP) Encouragement of hiring of local labor Consideration with local population on additional cattle crossings as required Compensation for loss of income should be paid or other appropriate mechanisms will be put in place according to the legislation of Kazakhstan and RAP	Contractors Akimats	CfR, Akimats/local authorities and contractors	Regular monitoring of possible impacts on farmers shall be carried outby Construction Supervision Engineer Committee for Roads will monitor the compensation payment to the affected persons.	Long-term consequences are possible if cattle crossings are not built
7. Historical and archeological monuments	There are no historical or cultural monuments observed along the road sections	Potential indirect impacts on burial grounds along the road	Potential indirect impacts on archaeological monuments if they are found	Archaeological monuments should be fenced to secure protection if they are found adjacent to the road Memorial place marks will be relocated in coordination with local authorities. Other historical places outside Right of Way, but within 2 km from the route have to be protected from plunder and destruction. Contractors shall observe the appropriate procedures in case	The contractor will be responsible for fencing of the archaeological monuments, burial grounds if they are available. In case of finds discovery, the Contractor should immediately inform the Department of Cultural Heritage and Art of the Ministry of Culture and Sport on any found artifacts or re-	Construction Supervision Consultant (CSC)/Engineer, local authorities and authorized representatives of the Department of Cultural Heritage and Art of the Ministry of Culture and Sport will check compliance with this plan and procedures in case of finds discovery.	Construction Supervision Consultant (CSC)/Engineer and authorized representatives of the Department of Cultural Heritage and Art of the Ministry of Culture and Sport	Provided that all laws will be observed and the specified archaeological sites will be fenced and memorial place marks relocated, long-term influence is not expected.

				of findings. According to the state procedures, works will be immediately stopped, for studying, record and excavation.	mains, and stop all construction works and notify the authorities on cultural heritage. Protection of other monuments is responsibility of institutions on protection of cultural and archaeological heritage (i.e. Ministry of Culture and Sport)			
8. Traffic safety	The traffic volume on the main road can affect the traffic safety.	Potential impact is from low to medium	Road sections, located close to settlements and places of access/bypass roads joining the main road	Speed limit enforcement Correct road marking and signage shall be erected Informing of local population. Responsible actions of the contractor. Organization of additional crosswalks, if necessary.	Committee of road traffic police of the MIA of the RK	Regular monitoring and reporting of any accidents and complaints	Construction Supervision Consultant (CSC)/Engineer Committee of road traffic police of the MIA of the RK	No long-term impacts
9. Waste management	Generation of the construction debris and household wastes which are subject to landfill disposal.	Potential impact is low to medium	Potential impacts near construction camps	Construction debris will be used (if technically possible) for roadbed construction. Household waste must be regularly exported from the section to the designated landfills	Contractor in cooperation with local authorities	Construction Supervision Consultant (CSC)/Engineer should carry out regular monthly monitoring of sites and activities on waste management	Construction Supervision Consultant (CSC) and local authorities	Provided that all waste will be exported to the designated landfills, long-term impacts are not expected

10. Borrow pits and access roads	Borrow pits: Local violations in environment, especially dust and noise from equipment and vehicles. Inconveniences for agricultural activity Access roads: Inconveniences for agricultural activity	Potential impacts are possible. Existing pits have been already defined, but additional borrow pits will be required. Location of access roads has to be coordinated with local authorities within 2 weeks after the beginning of works.	Considerable local impacts near pits and access roads are possible.	Location of borrow pits and access roads have to be coordinated prior to the works commencement Only approved pits can be used, together with the plan of works on closing and reclamation	Contractors Regional offices of the Committee for construction, housing and utilities infrastructure and land resources management of the RK	Regular monthly and special monitoring of any influences, cases and complaints	Construction Supervision Consultant and local authorities	Provided that impacts are mitigated properly, long-term influences are not expected.
11. NOx, PM, CO, for air quality and temp, Ph, TSS, hydrocarbons etc. for water quality	Increased traffic will create air pollution and accidental spills of polluting or hazardous materials negatively impacts on water quality	Potentially significant if the, current and forecasted traffic growth increased significantly	Generally in the main area of construction, the existing roads or bypass roads; Potential impact on adjacent villages Local influences on sites in Karaganda, And Zhambul oblasts are not predicted	All vehicles and the equipment used in construction have to be modern, be appropriately maintained and used according to recommendations of manufacturers. All access and bypass roads have to be watered. All plants/dust-generating equipment should be in good repair and be located at distance from all sensitive zones.	The contractor shall bear the responsibility for implementation of mitigation measures. Supervision Engineer monitors the compliance with mitigation plan.	Regular (monthly) monitoring by licensed laboratories at designated sampling points and on-site compliance checks by Construction Supervision Consultant (CSC), Engineer and local environmental protection authorities	Contractors Construction Supervision Consultant (CSC)/Engineer	Contractors Construction Supervision Consultant (CSC)/Engineer
12, Hydrocarbon Spills	Water pollution due to spilled bitumen	Potentially significant	During the construction period to enter either running or dry streambed nor shall it will be disposed of in ditches or small waste disposal sites prepared by the Contractor..	Bitumen storage and mixing areas must be protected against spills and all contaminated soil must be properly handled according to legal environmental requirements. Such storage areas must be contained so that any spills can be immediately contained and clean up. Development of an emergency response plan	The contractor shall bear the responsibility for implementation of mitigation measures. Supervision Engineer monitors the compliance with mitigation plan.	Regular monitoring and reporting of any accidents and complaints	Contractors Construction Supervision Consultant (CSC)/Engineer	Contractors Construction Supervision Consultant (CSC)/Engineer

Table 9.2 IMPACTS DURING OPERATOIN; MITIGATION MEASURES, MONITORING AND RESPONSIBILITY

CATEGORY	POTENTIAL IMPACT	SIGNIFICANCE	LOCAL IMPACTS	MITIGATION	RESPONSIBILITY	MONITORING FREQUENCY	RESPONSIBILITY
1. Air quality	Emissions from vehicles on the road Emissions from roads repair and maintenance activities	Insignificant provided that vehicles are in good operating conditions	Potential impact on adjacent sections in Karaganda and Zhambyl oblasts; Other local consequences are not expected	All vehicles must meet emissions standards All the equipment used for road repair and maintenance meets emissions standards Regular monitoring near residential areas to determine the necessity for additional mitigation measures	Committee for Roads, Committee for Environmental Regulation and Control of Karaganda and Zhambyl oblasts	Monitoring near residential areas and other areas if necessary, weekly	Contractors within the warranty period
2. Noise and vibration	Emissions from vehicles on the road Emissions from roads repair and maintenance activities	Insignificant provided that vehicles are in good operating conditions	Potential impact on adjacent sections in Karaganda and Zhambyl oblasts; Other local consequences are not expected	All vehicles must meet noise level standards Old and faulty vehicles must not be found on the road Compliance with minimum and maximum speed limits All the equipment used for road repair and maintenance meets noise level standards	Committee for Roads, Department of Ecology of the Committee for Environmental Regulation and Control and Sanitary-and-Epidemiologic Institutions of Karaganda and Zhambyl oblasts	Monitoring near residential areas and other areas if necessary, weekly	Contractors within the warranty period
3. Water, drainage system and floods	Stability of water sources for operation Floods, pollution of surface and ground water due to activities on the road and in services/rest areas	Potentially localized impact Pollution is insignificant if the road is effectively managed	There are no specific local impacts	Maintaining drainage system in a proper condition Good road management and maintenance will ensure normal watercourses	Committee for Water Resources "Kazakhavtodor" Republican State Enterprise Local executive authorities	Monitoring of ground water and drainage within the right of way of the alignment, by weekly	Committee for Water Resources
4. Flora and fauna and protected territories	Long-term impacts on animals, especially migration and movement routes. Disturbance of flora and fauna resulted by the use of salts and chemical substances for deicing There might be an increase in illegal hunting due to wider accessibility	Low impact	No specific localized impacts	Cattle droves will serve as passages for wild animals (will be incorporated in the design) Study the necessity of additional passages through pipes under the bridges for big mammals Control and prohibit illegal hunting	Oblast regional inspection of the Department for Forestry and Fauna	Committee for Roads, Committee for Forestry and Fauna, as well as oblast administration, by weekly	Oblast regional inspection of the Department for Forestry and Fauna "Kazakhavtodor" Republican State Enterprise jointly with the district administration follows the necessity in

							additional crossing points within the alignment for mammals and others
5. Social / Economic / Farmers	Increase in economic activities due to the improved road. Opportunities for constant work within the roads maintenance Opportunities for business and employment in roadside service areas Some disturbance to the activities of farmers who were affected by land acquisition for the road construction	Significant economic and social benefits Some unfavorable consequences in relation to the farmers' activities due to the necessity of underpasses use for movement of cattle and agricultural machinery	There no specific localized impacts, except for agricultural and grazing lands Villages along the existing road alignment	Hold informative activities for local communities on benefits that can be obtained from the improved alignment Consider additional livestock droves and passages for agricultural machinery if necessary and required (See Mitigation Measures)	Local executive authorities and "Kazakhavtodor" Republican State Enterprise will consider additional underpasses (bridges) in collaboration with local communities, if necessary Akimat/ local executive authorities	Monitoring of unfavorable impacts on local communities and farmers Affected persons will be kept in touch for checking compensation payment and other compensation forms provision, monthly	Administration of districts and Zhambyl and Karaganda oblasts .
6. Traffic safety/ Aesthetics	Increase in accidents Danger for pedestrians, there is not sufficient amount of pedestrian crossings	Low/ medium impact level	Regular passages crossing the road alignment	Special measures in the project will decrease the accidents risk: dividing strip, good visibility, limited access and exits, guard posts, etc. There will be several settlements near the road and a small number of pedestrians near the road or roads intersection	Will be incorporated in the design	Monitoring and registration of all road accidents, daily	"Kazakhavtodor" Republican State Enterprise
7. Waste management	Waste generated from the road maintenance and rest/service areas: collection and disposal issues	Low impact	In rest and service areas	Committee for Roads should provide regular cleaning and collection of all liquid and solid wastes, as well as disposal in accordance with approved regulations and procedures. The company for road operation will be responsible for waste collection from rest/service areas	"Kazakhavtodor" Republican State Enterprise and Committee for Environmental Regulation and Control	Regular monthly monitoring of sites and wastes collection and disposal, monthly	"Kazakhavtodor" Republican State Enterprise

10 DISCLOSURE OF INFORMATION, CONSULTATION AND PUBLIC HEARINGS. PARTICIPATION OF PARTIES AND GRIEVANCE MECHANISM

During the collection of baseline data for the environmental and social assessment carried out by "KazdorNII" JSC and "KazCEP" LLP for consultation with local residents, public hearings were held. Public hearings in Kazakhstan are often not visited by the general public, and it happens that it is limited to participation of representatives of local authorities. In order to cover more people with public hearings, holding public hearings was announced in newspapers and informative posters were posted on the buildings of territorial akimats. Copies of announcements in newspapers and informative posters are attached in Appendix 3.

"KazdorNII" JSC and "KazCEP" LLP held public hearings on June 05-06, 2015 in the villages of Aksu-Ayuly, Akshatau, Saryshagan and on June 17-18 in the town of Balkhash, in villages of Gulshat, Kurminka, Kashkanteniz, Shyganak. The held public hearings provided an opportunity to local residents and the parties involved in the project to get familiar with the general details of the project and discuss issues of concern relating to environmental and social aspects, express their suggestions and recommendations to be included in the ESIA and RPF.

Additional public hearings/consultations were held on November 04-05, 2015 in Aksu-Ayuly v., Balkhash city and Shyganak v., the discussed issues were mostly about the project design in relation of the ESIA and activities of environmental protection, locations of junctions and cattle passes (that is very important for social aspects), compensation to the affected people and the businesses and also locations of constructions facilities (concrete constructions, constriction camps, parking and etc.) and water supply resources were discussed.

Preliminary public hearings were successful. Minutes of data on those public hearings are presented in Appendix 2. During the review of the submitted presentations, the participants of the hearings asked questions regarding the location of junctions and livestock droves, as well as design solutions for junctions. At the end of the regular public hearings optimum locations for livestock droves and junctions will be proposed.

The next public hearings and consultations of concerned parties will be held for the purpose of the ESIA project discussion with participation of people from the nearby settlements and local settlements located along road site. Thus, upon completion of ESIA project preparation (and also after Bank comments), the ESIA document will be published and the public hearings will be organized for it.

Consultation at the stage of preparation was carried out in the form of interview with local residents, discussions and meetings. The following persons were involved in process of consultations during preparation of the project:

a. Head of households likely to be affected

b. Household members
c. Communities
d. Local Akimat
e. Major project concerned parties such as women, highway users group, healthcare workers

During public hearings information brochures will be distributed. Brochures were developed by PMC consultant and it includes the general description of the project, the general explanation of processes, the rights of owners and land users, the list of category of compensation, payment and grievance mechanism, as well as contact information. These brochures and other information, concerning the project, will be available in all oblast and regional akimats where each concerned party can visit and receive the information of interest.

At the design stage and project implementation stage more informal consultations will be held by:

- The preparation and distribution of brochures both in Kazakh and Russian, with project description, works and proposed timing of works execution; and
- Setting up formal Grievance Redress Committee (GRC) involving local communities. The Project Supervision Consultant in association with the Contractor will be responsible for the effective grievance redress program management.

At the designing stage, which is now in progress, the Committee for Roads of MID RK and Akimats of Karaganda and Zhambul oblasts and the PMC consultant will consult with the potentially affected land owners of the various villages along the proposed route of Karaganda- Balkhash-Burylbaital road alignment.

During the consultations of designers with local habitants all technical parameters of the road, drawing of the proposed works, the expected benefits, expected impacts, including the expected mitigation measures, the number of underpasses, design solutions for abutment design of bypasses, junctions and underpasses for the needs of owners of land and farms, the placement of production base and a testing ground for debris removal is determined, the possibility of the use of water for technological needs of the nearest water bodies, information on land set aside for farms within the area of construction of the road have been also collected and considered.

Upon completion of design for all fourteen (14) road sections taking into account design decisions, the Environmental Management Plan (EMP) will be developed for separate sites/lots. EMP will determine terms, frequency, duration and cost of actions for mitigation of impacts on environment in the implementation schedule and will unite these actions with the full plan of project work. EMP will include the Plan of monitoring by means of which control of impacts on environment and introduction of measures for mitigation during construction will be executed. EMP on each of sites/lots will be translated both into Russian and Kazakh languages and are published on the website of the project, Committee for Roads and the relevant district akimats. EMP will be published in English on the WB web-site. Also, on each EMP public consultations in the region of the project will be organized.

10.1 Institutional Responsibilities and Grievance Redress Mechanism

The Project Management Consultant (PMC) will play a key role in the organizational setup for Resettlement and Lands Acquisition Management during Project implementation. According to the PMC's Terms of Reference (ToR) there will be two social safeguards specialists (one international and one local) working for the entire duration of the Project. Part of their duties and responsibilities will include the management of this ESIA and RAP implementation.

The PMC will carry out an independent assessment of the land acquisition process to inform the Committee for Roads and World Bank and prepare one final report on external monitoring and evaluation of resettlement and submit to the World Bank.

10.2 Grievance Redress Mechanisms including Grievance during Construction

Guideline on Grievance Redress Mechanism (GRM Guideline) is designed and approved in 2014 by the Committee for Roads MID RK for all road sector projects. GRM Guideline is intended to be used as a guidance document for concerned parties involved in design, preparation and implementation of road projects, and complements grievance redress requirements incorporated in the loan agreements, as well as environmental and social safeguard documents (in case of projects funded by IFIs).

The overall objective of the GRM Guideline is to establish an effective communication channel among the concerned parties for providing a timely and efficient two-way feedback mechanism to address any complaints made about the project, including those from members of the communities, local businesses and other concerned parties, as well as raising public awareness on the projects and on the availability of a GRM mechanism. The Grievance redress procedure suggests resolution of grievances in the spirit of mediation between the parties, and should comply with the spirit of IFI standards and practices.

The GRM will be available for those living or working in the areas impacted by the project activities. Any person impacted by or concerned about the project activities will have the right to participate in the GRM, will have easy access to it, and will be encouraged to use it. The proposed GRM does not replace the public grievance redress and conflict resolution mechanisms envisaged by the legal system of the RK, but attempts to minimize use of it to the extent possible.

10.3 Grievance Registration

Complainants or concerned parties may visit Akimats, call or send a letter or e-mail or fax to grievance redress coordinator, Public Service Centers and MID RK to register their grievances related to road sector projects. Receipt of grievances received through a letter or e-mail or fax shall also be acknowledged through a letter / e-mail / fax within 3 working days upon receipt by the grievance redress coordinator at regional level. Receipt of grievances lodged in person or via phone will be acknowledged immediately.

Complainants or concerned parties may visit, call or send a letter or e-mail or fax to community Akimat, grievance focal point at CCs and CSCs, GRC Coordinator of the representative at CoR MoID RK to register their grievances related to road sector projects. Receipt of grievances received through a letter or e-mail or fax shall also be acknowledged through a letter / e-mail / fax within 3 working days upon receipt by GRC coordinator at regional level. Receipt of grievances lodged in person or via phone will be acknowledged immediately.

Each party participating in the GRC at regional level shall maintain a record-book to register the complaints, and regularly share the grievance details with GRC coordinator at regional level, in order to keep the track of grievances and the status of their resolution. The GRC coordinator at the regional level shall coordinate with each member of the GRC on a weekly basis, collect relevant documents, maintain a consolidated registry of complaints received, follow-up on the status of resolution of each complaint received, maintain an up-to-date grievance database and provide relevant reporting.

Whichever method is used for receiving the grievance (e.g. e-mail, mail, fax, call, etc.), its registration will be made by the GRC coordinator at the regional level, who will acknowledge receipt and follow up with the grievance investigation and consideration by the GRC at regional level. All the grievances will be recorded in a standard format, including, but not limited to, the following details:

- Contact information of the affected party;
- Date, time, and place where the complaint was received;
- Full name of the person who received the grievance;
- Details of the grievance redress case.

The project will pursue a participatory approach in all stages of planning and implementation. This is expected to ensure that the affected people have nothing or little to complain about. However, some people may still remain dissatisfied for some reason or the other. Many grievances arise due to inadequate understanding of project policies and procedures, and can be promptly resolved by properly explaining the situation to the compliant.

In case the complainant refuses to provide contact details or no contact information is available in the grievance received by e-mail / mail / fax, the GRC at the regional level will consider the anonymous complaint. In such cases, the printed response will be posted at the information board of KazAutoZhol's respective regional branch, as well as at the information board of the relevant Akimat, so that the complaining party could get familiarized with the feedback.

The GRC coordinator at regional level will collect the data on grievances and centralize the grievance registry to assure that every affected person, group or community has an individual registry number and that follow-up and corrective actions are implemented as per resolution provided, or if the issue was not resolved at regional level, it is passed for consideration at the central level. The grievance database will be maintained and updated twice a month by the GRC coordinator at regional level for each project. The database will be designed to make it simple and easy to input data, provide information on grievance and status of its resolution, timing for resolution and level at which the issue was considered and resolved, track individual grievances, etc.

The grievance database will specify details of grievance resolution and include information on satisfaction of complaining party by the resolution provided (excluding the cases of grievance lodged anonymously). Where it will not be possible to resolve grievances to the satisfaction of both parties, appropriate information will be reflected in the database. The GRC coordinator at regional level for each project will share the grievance database with the safeguard specialist of KazAutoZhol central office / GRC coordinator at central level, who will maintain and update the centralized grievance database for all road sector projects.

10.4 Grievance Processing

Depending on the nature of grievance, this step may include verification, investigation, negotiation, mediation or arbitration, coordination with appropriate agencies and decision-making. Verification includes collection of documents, proofs and facts, as well as clarifying background information in order to have a clear picture of the circumstances surrounding the grievance case. Verification will be undertaken by members of the GRC at the regional level, and overall coordination of activities will be ensured by the GRC coordinator on regional level. Results of verification or fact-finding activities will be presented at the meeting of the GRC at regional level, where the issue will be considered and resolution will be sought out.

The GRC at regional level will discuss the grievance case within ten working days and recommend its settlement to parties. Regular meetings of the GRC at the regional level will be held twice a month; however, special extraordinary meetings can be arranged between the regular meetings as needed. The GRC coordinator at regional level will ensure that actions and decisions are properly documented in order to demonstrate that the GRC at regional level is providing an appropriate attention to the grievance and is actively seeking ways to obtain resolution that could satisfy the parties.

If a grievance cannot be resolved by the GRC at the regional level and is forwarded for consideration by the GRC at the central level, appropriate documents collected during investigation and fact-finding shall be shared with the GRC coordinator at the central level. The GRC coordinator at the central level will circulate such documents among the members of GRC at central level, to ensure that they are aware of all relevant details prior to GRC meeting.

Consideration of grievance case by GRC at central level may require further verification of the issue, including collection of additional documents, obtaining input from various state concerned parties and project parties in order to have a clear picture of the circumstances surrounding the grievance case. Additional verification will be undertaken by members of GRC at the central level (as needed), and overall coordination of activities will be ensured by the GRC coordinator at central level. Results of verification will be presented at the meeting of GRC at the central level, where the issue will be considered and resolution will be sought out.

The GRC at the central level will discuss the grievance case within twenty working days and recommend its settlement to parties. Regular meetings of GRC at central level will be held on a monthly basis; however, special extraordinary meetings can be arranged between the regular meetings as needed.

If following its consideration by the GRC at central level, the grievance cannot be resolved to the satisfaction of the parties; the recommendation will be made to seek resolution through the courts. Irrespective of the outcome of grievance consideration, documentation regarding the case by the GRCs at regional and central levels will be collected and maintained by the GRC coordinator at central level (with input from the GRC coordinator at regional level). The GRC coordinator at the central level will keep a separate track of cases, which were not resolved through GRM and were referred to the RK legal system.

10.5 Disclosure of Grievance Redress Procedures

The grievance redress procedure information for the project will be disseminated through information leaflets and brochures, and presented during the project related meetings and public consultations. During these meetings, it should be emphasized that the informal GRM is aimed at quick and amicable resolution of complaints and does not substitute the legal process established under national legislation.

At the beginning of each project (commencement of construction at each section of the road) community consultation shall be carried out by CCs and CSCs under the coordination and supervision of the GRC coordinator at regional level to ensure people's awareness of the availability of the GRM, steps of grievance resolution as well as contacts and locations of authorized entities to be approached in case of grievance. CCs, CSC, PMCs, oblast offices of the CfR of the MID of the RK and Akimats, as well as NGOs and professional mediators are considered as the key parties of the GRM and play a crucial role in disseminating the information on GRM and facilitating quick and amicable resolution of complaints. The GRC coordinator at the regional level shall coordinate information dissemination activities on GRM, and ensure that the posters providing details on GRM and contacts of grievance authorized entities of CCs and CSCs, GRC coordinator at regional level are posted in publicly accessible and visible places at every construction site and in every affected community. In addition, the information on GRM (leaflets, brochures), including contact details of grievance authorized entities of CCs and CSCs, GRC coordinator at regional level, should be available at the offices of CCS, CSCs, PMCs, Akimats, CfR.

In the areas populated by ethnical minority groups, meetings shall be held and information leaflets shall be provided in the linguistically appropriate manner, if the language used by the ethnical minority group is different from official language of RK.

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11 APPENDIXES

APPENDIX 1
UPDATED STATUS OF THE VARIOUS DESIGN CONTRACTS DEVELOPMENT

APPENDIX 2
PUBLIC HEARINGS MINUTES

Public Hearings Minutes of Meeting

Aksu Ayuly village

Date: June 5, 2015 12:00 p.m.
Location: building of Akimat, Aksu Ayuly village.
Public hearings are organized by Akimat of Aksu Ayuly village, KazCEP LLP
Information about public hearings has been brought to the attention of the public via: Announcement
Participants: 17 people, residents of Aksu Ayuly village, representatives of local executive bodies, representatives of KazCEP LLP
The agenda of the public hearings:
Informing the public about the project of the Center-South road corridor, familiarize local residents with the Terms of Reference for the preparation of detailed Environmental and Social Impact Assessment and Environmental Management Plan.
Agenda:

1. Election of the chairman of the public hearings;
2. Election of the secretary of public hearings;
3. Public decisions on the subject of the hearings;
4. Time limit on speeches is 3 minutes.

By the majority of votes:

1. The Deputy Akim of Aksu Ayuly village, **Toleukulov B.T.**, was elected as the Chairman of the public hearings
2. The public relations officer of Akimat of Aksu-Ayuly village, **Tuleukulov N.M.**, was elected as the Secretary of the public hearings

Speakers:
1. Representative of the local executive bodies, Deputy Akim of Aksu-Ayuly village, **Toleukulov B.T.**
After welcoming all those who attended, he introduced representatives of KazCEP LLP to the villagers, nominated Tuleukulov N.M. as the Secretary of public hearings. The purpose of the public hearings is discussion of the Centre South project (Astana - Karagandy- Balkhash-Almaty), introducing locals with detailed Environmental and Social Impact Assessment and Environmental Management Plan.

1. Representative of KazCEP LLP, **Zhaysanbayev Yerzhan**.
After welcoming all those who attended, he thanked them for their participation in the hearings. He noted the importance of the public hearings and said that the improvement of roads and infrastructure is the main component "Nurly Zhol" new economic policy of the country. He provided a summary of the Terms of Reference for the Environmental and Social Impact Assessment. He noted the importance of renovation, reconstruction and construction of the new road sections. Renovation and new construction will convert the existing road.

2. Representative of KazCEP LLP, **Isseyeva Gulmira**.

Having welcomed and thanked those who attended for their participation in the hearings, she noting the importance of the public hearings and said that an important element in assessing the impact of economic activity on the environment are environmental and social indicators.
In order to comply with the environmental legislation of the Republic of Kazakhstan, and reduce the negative impact of the proposed activity on the environment and human health, environmental and social management plan, consequences management and mitigation measures are provided.

3. Resident of Aksu Ayuly village, **Mussagulov S.D.**, Head of Construction Department in Shet District
When do you plan to start the project implementation, in which year the works will take place in Shet District?

4. Resident of Aksu Ayuly village, **Ibrayev M.A.**, Lawyer for Land Issues
Will it be a toll road? Will it affect the local people? What is the procedure for the resettlement of land owners, which compensation will they have?

5. Resident of Aksu Ayuly, **Mukhtarov M.S.**, a Business Representative
In case of distancing from the existing road, will there be location options for opening or relocating the roadside businesses? How and when is it necessary to apply for acquiring roadside areas? Will the local building materials and production capacities be used during the project implementation?

Public hearings conclusions:
Upon review and discussion of the ESIA project due to lack of objections and unanimity that the planned activity will not have substantial adverse effect on the environment and public health, the following results have been summarized:

The Central South project has been approved.

Chairman of Public Hearings:
Toleukulov B.T. _____

Secretary of Public Hearings:
Tuleukulov N.M. _____

APPENDIX 3
ARCHAELOGICAL EXPERTISE REPORT

CONCLUSION
of the archaeological research for Karaganda-Burylbaital road area

Construction/Reconstruction Facility: Karaganda-Burylbaital road.

Construction/Reconstruction Localization: Karaganda Obl, Almaty Obl, Zhambyl Obl.

Results of the research in terms of discovery of historical and cultural sites in road alignment area

The expertise has been conducted in accordance with the methodology of archaeological expertise by means of preliminary work with archival and bibliographic data, space images analysis.

According to the Order № 156 dated December 29, 2014 of the Minister of Culture and Sports of the Republic of Kazakhstan on the approval of the Rules for Identification and Use of Protected Areas, Regulation of Development and Protected Natural Landscape Areas of Historical and Cultural Heritage Objects, paragraph 2, subparagraph 5:

Archaeological site is surrounded by a restricted area of 50 meters from its borders; in case if there is a group of sites – from the external borders of the extreme objects of historical and cultural heritage. Visibility within a radius of restricted area equal to 200 meters from its center shall be provided for the archeological site.

In the course of the expertise implementation, all the objects of historical and cultural significance (hereinafter referred to as Sites) within the expertise area (200 m right and 200 m left of the axis of the Road alignment) have been registered.

Following the research, 8 historical and cultural sites have been identified in the area of the road alignment. (see Table 1).

Accurate conclusion in relation to availability/absence of historical and cultural sites in the road alignment area can only be made based on the results of archaeological expertise and full-scale survey prior to the start of design and construction works.

Analysis of the sources shows that the road alignment area is characterized by archaeological sites of different eras - from the Stone Age to Modern Age.

Construction works without archaeological expertise are connected with risks for the project.

According to Article 127 of the Land Code of the Republic of Kazakhstan dated June 20, 2003 № 442-II

In case of discovery of historical, scientific, art and cultural value objects, land users are obliged to suspend further conduct of works and report thereof to the authorized body for protection and use of historical and cultural heritage objects.

All types of works that may pose a threat to the existence of historical and cultural heritage objects are prohibited.

According to Article 39 of the Law of the Republic of Kazakhstan dated July 2, 1992 № 1488-XII "On Protection and Use of Historical and Cultural Heritage Objects":
P.1. In the development of areas for land acquisition, research works to identify historical and cultural heritage sites must be carried out.

P 3. Works implementation that may pose a threat to the existence of historical and cultural heritage objects is prohibited.

However, the Law does not regulate the timing of the scientific-research works. The term for the scientific-research works is defined by an expert for each individual object, depending on the amount and scope of works.

Table 1: Historical and Cultural Heritage Objects that have been discovered in Karaganda-Burylbaital road construction area.

№ №	**Object**	**Coordinates (WGS 1984 UTM 43 T zone)**	**Description**
1	Kuygenzhar Grave Field	42 U 690337 5664759	Kuygenzhar Grave Field. Consists of 5 kurgans, two of which have been studied in 2003.
2	Kyzyl-Zhar Grave Field	42 U 690251 5664600	Kyzyl-Zhar Ground Grave Field. It is not fixed on the surface visually. Opened in 2001 in the course of construction works. Two burials have been studied. Dated to the Bronze Age.
3	Karboz Mausoleum	E 496745 N 4919096	Karboz Mausoleum (marked as Sorali Mazar on the topographic map) is located in the hill dominating countryside, and represents the remains of the melted conical structure, rounded in terms of shape, made of mudbrick with the size of 35x15x10 cm. Small mound is melted remnants of the mausoleum with a height of 1.3 m and a diameter of 10 m. the Mausoleum diameter is 5 m, preserved height of the walls is 3.5 m. Sub-triangular entrance is located in the south-eastern wall of the Mausoleum. Its height is 0.8 m; thickness of the walls at the entrance is 1.4 m. A modern memorial stele with zoomorphic finial is installed in front of the Mausoleum. Pits for cob batching have been registered to the

			north of the Mausoleum.
4	Kurgan-type Grave Field	E 496900 N 4918328, E 496900 N 4918328	Kurgan-type Grave Field consists of two kurgans, located on a hill. Kurgan 1 represents a stone-earthen fill of round shape with a diameter of 15 m and a height of 0.7 m. Kurgan 2 represents a stone-earthen fill of round shape with a diameter of 13 m and a height of 0.6 m. The site is dated to the Early Iron Age.
5	Kurgan-type Grave Field	E 494647 N 4919399, E 494652 N 4919387	Kurgan-type Grave Field consists of two kurgans, located on a low hill. During the laying of the connection cable through the site territory, Kurgan 2 was destroyed. Kurgan 1 represents a stone-earthen fill of oval shape with dimensions from north to south – 12, and from west to east – 10 m. The height of the Kurgan is 0.7 m. Kurgan 2 represents a shapeless stone cobble fill – remnants of the destroyed kurgan fill. The site is dated to the Early Iron Age.
6	Single Kurgan	E 488801 N 4921515	Single Kurgan is located on a dominating hill. The site represents a stone-earthen fill of compressed hemispherical shape. The Kurgan diameter is 11 m, height is 0.4 m. The site is dated to the Early Iron Age.
7	Single Kurgan	43 T562936.84 4892888.79	Fill of the Kurgan is of compressed hemispherical shape, rounded in its plan, made of earth and stones, slightly matted. Diameter is 13 m, height is 0,3 m. There is a ditch with a width of 0.8 m and depth of up to 0.2 m in the outside edge.
8	Kurgan-type Grave Field	43 T564370.19 4891853.56	Consists of five kurgans stretched within SW-NE line. Fills are made of earth and stones, compressed hemispherical shape, rounded in its plan. Diameter of fills ranges from 11 to 15 m, height – from 0.1 to 0.3 m.

Historical and Archaeological Information on the Research Region

M-36 Almaty-Yekaterinburg road, Karaganda-Burylbaital section, runs mainly through the territory of Central Kazakhstan.

The road covers two major cultural and historical regions – Saryarka and Betpakdala.

Saryarka is the region covering the Kazakh Uplands. This region was a major cultural center in the ancient times of Middle Ages. This was facilitated by natural conditions. Small steppe rivers and streams allowed ancient farmers working out the skills of irrigation networks creating. Low

technological level did not allow them subduing the elements of such rivers as the Syr Darya and Ili. Under these conditions, a type of farming, designated as "streams agriculture", has been formed in Saryarka.

Saryarka is also characterized by the cultural activities centers that were linked to the mountain and forest oases, such as Kent, Karkaraly Kyzylaray, Bektau-Ata. Favorable conditions of these places allowed people exploring the adjacent vast steppe areas.

Betpak-Dala clay desert is located southward of it. The region is characterized by unfavorable natural and climatic conditions. This explains few discovered sites of historical and cultural heritage in significant areas of the archaeological expertise sections. However, one can argue that these lands were lifeless in historical retrospective.

Betpak-Dala was one of the transit sections of the primary settling of the continent by humans, as evidenced by the materials of Zhaman-Aybat Lower Paleolithic sites[3].

Places of stay of vagrant hunters and gatherers of the Stone Age were usually related to the water sources that were extremely valuable in desert conditions. Water also attracted animals that were hunted by ancient people during watering.

The basic material used to produce tools of that time was stone. Therefore, traces of human activities often can be detected in places where the stone material was produced. The most valuable rock was flint.

In the Bronze Age, humanity made a breakthrough in its development – production of metal tools was mastered. Throughout the territory of Kazakhstan, producing types of farming were spread – cattle-breeding and agriculture. Central-Kazakhstani region was then becoming the largest center for bronze metallurgy[4].

At that time, the Central Kazakhstan was a part of the Andronovo cultural and historical community and was one of its largest cultural centers. Central Kazakhstani versions of Andronovo range cultures - Atassu and Nura – are vividly distinguished by richness and peculiarities from the synchronous cultures.

In the northern Balkhash region, ancient mines of Sayak group, Kounrad and Gulypad, located at a considerable distance from each other, were revealed.

Sayak group (Modybay, Sayak-1-U, Berkara-Zhilnaya, Tastau, Zhambas ancient mines) is located to the east of Balkhash city at a distance of 180 km, and Kounrad field – 17 km north of the city. Gulypad polymetallic field is located 50 km to the southwest of Balkhash city. We have studied hundreds of developments in these mines.

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[3]Klapchuk.N. TheFirstPaleolithicFindsin Central Kazakhstan // SA. 1964. № 3.

[4] KadyrbayevM.K., KurmankulovZh.K. Culture of Ancient Cattle-Breeders and Steel-Workersof Saryarka. Alma-Ata, 1992

At that time, reference of human settlements to natural water sources was weakening because people had learned to dig wells. For that reason, the remnants of Bronze Age settlements can be found even in the distant areas of Betpak-Dala.

In the early Iron Age, there was a change in the form of farming – the bulk of the population of Kazakhstan proceeds to nomadic cattle-breeding. Nomadic cattle-breeding had been the most productive form of farming in arid conditions of the Eurasian steppe zone for two thousand years.

Horse riding, active mode of life of the population increased its mobility. Inter-regional contacts were expanding. The larger areas were becoming developed by humans. At that time, Betpak-Dala and Saryarka were located in the area of Tasmola archaeological culture[5]. Tasmola culture, in its turn, was a part of the Saka-type range of cultures, which, along with the cultures of the Scythians and Sarmatians, form Scythian-Siberian cultural unity. The main characteristic of this unity was the so-called "Scythian Triad", which was represented by similar armaments, harness, as well as the Scythian animal style. Study of Tasaral Grave Field, located on the same name island off the west coast of Balkhash Lake, 39 km north-east from Saryshagan Station[6], vividly describes the history of the region of that period. In the course of works, burials of people, accompanied by ceremonial objects, weapons, as well as jewelry made of gold and semiprecious stones (agate, carnelian), were managed to be discovered.

In the interim period, between antiquity and the middle Ages, Late-Hunnic state of Yueban was located in the Balkhash region.

The beginning of medieval period was marked by the entry of the territory of Kazakhstan in the Turkic Khaganate[7]. In subsequent periods, Central and Northern Kazakhstan was under the authority of Kimek and Kipchak tribes[8]. This period is characterized by weak population in Betpak-Dala.

In the developed Middle Ages, Central Kazakhstan was a part of the Mongol Empire of Genghis Khan. In the structure of the Empire, the region belonged to the Jochid Ulus, which was called the Golden Horde later. For two centuries, the region was in the east wing of the Golden Horde. In the course of political crisis, the western Balkhash region was taken over by the Shaybanids ruler, Abulkhair, who lost it in the struggle against Kazakh sultans.

[5]A.Kh. Margulan, K.A. Akishev, M.K. Kadyrbayev, A.M. Orazbayev. Ancient Culture of Central Kazakhstan. Alma-Ata, 1966.

[6] Kukushkin I. A., Loman V.G. Tarasal Grave Field on Balkhash Lake //Begazy-Dandybay Culture of Steppe Eurasia. Almaty, 2013.

[7]Gumiyov L.N. Ancients Turkic People. M.: 1967

[8]Akhinzhanov S. M. Kipchaks in the Middle Age History of Kazakhstan. Almaty, 1995

Since the XV century, the region was a part of the Kazakh Khanate[9]. Kazakhs used the region as a transit area during seasonal migrations from Central to Southern Kazakhstan.

During that period, the population had completely abandoned sub-kurgan burials. Burials were decorated mainly with stone fencing or stoning. The population was increasingly mastering raw memorial architecture elements, resulting in an increase in the number of mausoleum burials.

In the XVIII century, the process of accession of Kazakhstan to the Russian Empire was started. The deepening of the colonization process led to creation of new administrative units without taking into account the traditional nomadic routes that led to a reduction in migration routes and an increase in settled way of life. Archaeological expression of this process was an increase in the number of fixed dwellings, which were represented by winter huts.

Table 2. Archaeological sites typical for the area of Karaganda-Burylbaital Road Construction

Period	Types of Sites	Archaeological Information
Stone Age	Sites and workshops of Paleolithic, Mesolithic, Neolithic, Eneolithic periods	The high concentration of sites of the period was due to the wealth of the region with stone raw materials necessary for production of tools
Bronze Age	Settlements, burials, menhirs, irrigation systems, minings	In the Bronze Age, Saryarka was the most socio-economically developed region in Kazakhstan. This was facilitated by climatic conditions that were optimal for integrated farming of tribes of that era, as well as the wealth of the region in non-ferrous metals. The last factor provided a stable economic base, high demographic indices and, consequently, the highest concentration of archaeological sites in comparison with the neighboring regions.
Early Iron Age	Kurgans, kurgans with "moustache"	During this period, the number of archaeological sites had been reduced to some extent compared with the previous epoch. This was due to climate changes, as well as the transition to nomadic cattle-breeding.
Early Middle Ages	Turkic burial and memorial complexes in the form of stone fences, stone sculptures - balbals, Kipchak kurgan burials, rock burials.	During this period, the concentration of archaeological sites was still comparable with the previous period.
Developed Middle Ages	Sites of ancient settlements, mausoleums	This period corresponds to the time of the Golden Horde existence. At that time, Ulytau sub-region was becoming one of the political centers of Genghis Khan's eldest son, Jochi, possession. This was due to the sharp growth in residence-type cities.
Late Middle Ages	Kazakh graveyards and mausoleums	This period is characterized by population growth in the region and correspondingly high number of

[9]Klyashtorniy S.G., Sultanov G.I. Kazakhstan. Chronicles of the Three Millennia. Alma-Ata, 1992.

		sites of burial type mainly.
Modern Age	Kazakh winter huts	During this period, the population reduced its mobility. Fixed settlements, where winter grazing was carried out, started appearing.

Appendix A. Instructions for Measures in case of Discovery of Historical and Cultural Value Objects in the Development of Territories.

Law "On Protection and Use of Historical and Cultural Heritage Objects"
Article 39. Ensuring Preservation of Historical and Cultural Heritage Objects in the Development of Territories
p.2. In case of discovery of historical, scientific, artistic and cultural value objects, individuals and legal entities are obliged to suspend further conduct of works and inform the authorized body thereof.
p. 3. Implementation of works that could endanger the existence of historical and cultural heritage objects is not allowed

The objects that can be correlated with the historical and cultural sites are as follows: bone remnants of humans and animals, artifacts[10], remnants of architectural structures, burials and industrial complexes.

If any of these objects are detected, it is necessary to:

1. suspend construction works (the timing for construction works suspension will be determined by the archaeological expert, which will depend on the complexity of an object and scope of works);
2. fence the object detection area with signal fencing;
3. inform the historical and cultural heritage protection authorities which are subordinate to the regional offices of culture;
4. invite expert archaeologists from regional scientific-research centers.

Before the arrival of experts, it is necessary to carry out the following activities:

1. in case if the archaeological material is uncovered and not disturbed, it is necessary to cover it with soil, following the precautions;
2. in case if the archaeological material is moved to another location in the course of works, it must be placed into a solid unsealed container (carton or wood box); it is

[10]Artifact (Lat. *artefactum* ; *arte* - artificially + *factus* - made) in archeology is an object subjected to directed mechanical exposure in the past, discovered as a result of targeted archaeological excavations or any single-time random measures. Examples of artifacts are stone tools, jewelery, weapons, ceramics, structures and parts thereof, ancient campfire embers, bones with traces of human impact, and others.

recommended to use a primer, in which it was deposited, as a filler, preventing free movement of the finds in the box, as well as direct air contact;

3. before the arrival of experts, it is necessary to provide dry storage of boxes with archaeological materials in a dry room;
4. it highly recommended to register the finds detection locations and types;

If the historical and cultural value of the discovered artifacts is not obvious, it is necessary to photograph it. When taking a photo, it is necessary to try to achieve maximum image sharpness. The frame must include the object that allows envisaging the size of the object that is being photographed – a ruler, folding ruler or widespread standardized items – matchboxes, paper money, standard containers, etc.

Archaeological finds should be touched only when wearing gloves on the assumption of safe-keeping and sanitary-hygiene considerations.

APPENDIX 4
PUBLIC HEARINGS ANNOUNCEMENT

ANNOUNCEMENT

Dear residents of the District!

"NurlyZhol" program provides implementation of "Reconstruction of the CENTER-SOUTH Road Corridor, KURTY-BURYLBAYTAL and KARAGANDA-BURYLBAITAL Road Sections" project with a length of 905km.

In order to implement this project, the Ministry instructed the Project Management Consultants of KazDorNII/Sapa cz LLP, SAEN Engineering LLP, KAZCEP LLP to analyze the terrain and collect the initial information on the project for further submission to the Banks.

In this regard, under the chairmanship of akim of the district, a public hearing will be held involving representatives of KazDorNII/Sapa cz LLP on 05.06.2015(12.00) in the building of Akimat (1st floor, Mazhilis hall).

Sincerely, "District Department of Housing and Utilities Services, Passenger Transport, Roads and Housing Inspection" State Institution

APPENDIX 5
ROAD SECTION PHOTOGRAPHS

Karaganda-Balkhash Road Section

9.7 km from Karaganda, Kurma village, agro farm

Aksu village is at 80 km

Zhumabek village is at 11 k

Aksu village

Kokozek River is at 21 km, 2 meters width

Graveyard is at 122 km

Akzhal quarry

Railway crossing is at 1 km

Quarry and roadside building are at 356 km

Petrol station is at 5 km

Balkhash-Burylbaital Road Section

Starting point of the road at 0 km, Kokteniz café, Balkhash city

Gulshat village is at 52 km

At 280 km Shyganak village

Quarry is at 268 km, turn to Ulken village

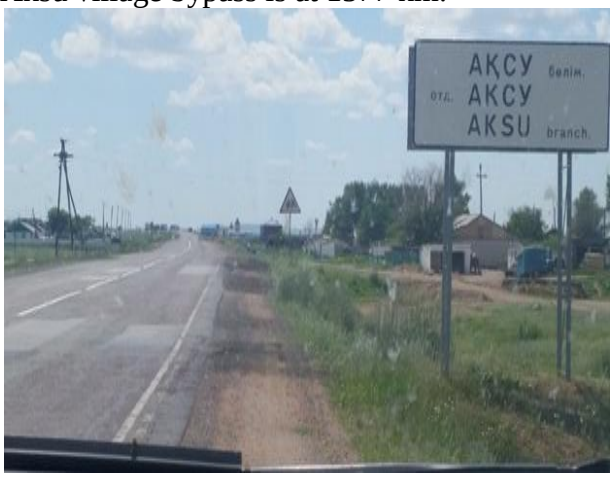
Helios petrol station is at 281 km near Shyganak village

Traffic police post is at 272 km

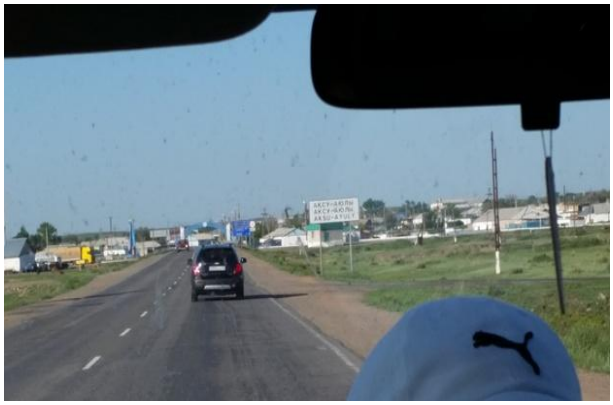
Section is beginning at 1497 km close to Karaganda.

Abay District starts from 1502,6 km

Aksu village bypass is at 1577 km.



"Kurma" farm bypass is located at 9.7 km from Karaganda.



Drive to Aksu-Ayuly village is located at 1609-1611.3 km (2.3 km length).

The picture of the city, several bypasses are required.

APPENDIX 6
TRAFFIC FLOW VOLUME ON ASTANA-ALMATY ROAD SECTION IN 2015

Information on traffic volume intensity and composition of traffic flow “Yekaterinburg-Almaty” National Road, Astana-Almaty Road Section, for the 1st quarter of 2015

Start of road section	Type of record	Cars and minibuses	Buses		Single-unit trucks					Road-trains with trailers, axis quantity				Semi-trailer bolster-type tractor, axis quantity					Tractors		Motorcycles	Total
			medium	heavy	Biaxial, capacity, tons			Triaxial and tetraaxial, capacity, tons											Light with trailer	heav. without trailer		
					до 2	2 - 5	5-10	5-10	10-20	11-11	11-12	12-11	12-12	111	112	113	122	123				
Akmola Oblast																						
1284	M-36-K15	4097	36	60	135	156	140	370	261	68	64	244	63	26	24	36	51	55	6	6		**5898**
1331	M-36-K16	3669	33	51	135	235	140	353	176	54	56	213	60	20	22	33	52	50	4	3		**5359**
Karagandy Oblast																						
1369-1414		7436	195	142	332	92	164	132	382	42	27	104	26	9	42	185	91	82	18	16	18	**9535**
1414-1444		12634	274	175	429	122	185	198	591	32	16	115	17	10	39	224	96	89	23	25	34	**15328**
1444-1457		**16308**	**358**	**246**	**375**	**268**	**272**	**342**	**635**	**45**	**26**	**32**	**19**	**11**	**42**	**274**	**104**	**124**	**22**	**14**	**18**	**19535**
1492-1610		9975	258	187	369	192	204	85	74	36	22	28	46	26	28	67	45	64	7	5	12	**11730**
1610-1707		8594	227	167	294	122	148	80	54	27	28	41	52	22	24	72	37	60	10	11	20	**10090**
1707-1857		7840	161	126	217	108	130	84	79	22	20	81	52	24	25	70	36	62	9	6	12	**9164**
1857-1991		9890	110	106	162	90	102	67	82	32	34	76	35	8	42	92	89	60	4	5	7	**11093**
1991-2005		7243	92	90	164	64	81	54	84	22	30	68	30	9	34	76	49	73	2	4	10	**8279**
Zhambyl Oblast																						
2005-2213	M-36-K-24	2419	170	79	158	254	126	466	737	13	39	47	32	12	9	0	0	0	6	2	0	**4569**
Almaty Oblast																						
2125-2407	M-36-O25	5660	7	25	11	15	45	63	67	14	10	18	20	3	13	31	34	27	6	3	7	**6079**

APPENDIX 7
INFORMATION ON DISTRICTS

Abay District

The District's area is 6.5 thousand square kilometers. The distance to the oblast center is 30 km. Abay city is the oblast center.

The District territory includes large rivers: Sherubay-Nura and Nura. There are two major water reservoirs: Zhartasskoye and Sherubaynurinskoye (Toparskoye Water Reservoir), where there are about 19 private recreational areas. The total area of reservoirs is 7237 hectares.
The closest object within the project alignment at a distance of 2 km is a quarry (angular coordinates 49 ° 42'54 "N 73 ° 10'26" E).

“Virazh” Hotel is located at a distance of 71 m from the roadway along the alignment (Coordinates: 49 ° 39'59 "N 73 ° 11'56" E). The hotel has 40 luxe-type rooms. (Figure 1).

Figure 5.1.9.1."Virazh" Hotelalong M36 highway

There is a formation of settling-vat water along the alignment, not reaching Kurminskoye village. The population called this formation a "stinky river". Preliminary, there is an assumption that the water reservoir was formed as the result of flooding of the territory. The nearest area of the water reservoir produces stinking odor. The geographical map has no signs of this pond, in the future, the origins of the reservoir will be studied together with the Department of Ecology in Karaganda Oblast (Coordinates: 49 ° 37'42 "N 73 ° 12'13" E).

Kurminskoye (Coordinates: 49 ° 36'53 "N 73 ° 12'29" E) and Zhumabek (Coordinates: 49 ° 35'51 "N 73 ° 13'11" E) rural settlements are located in the vicinity of the reservoir.

Kurminskoye village is the administrative center of Kurminskiy rural district, has a length of 2.1 km along the alignment. A graveyard is located at a distance of 500 meters from the road opposite the settlement (49 ° 36'41 "N 73 ° 13'13" E). The population of the village, according to the latest census, is approximately 1 238 people. Distance from the nearest houses to the alignment is about 35 meters. Distance between Kurminskoye and Zhumabek villages is about 370 meters.

Zhumabek is a part of Kurminskiy rural district. The population is about 196 people.

The main part of the population in the given area is engaged in agriculture and cattle breeding, as well as work at petrol stations. Due to the location of houses along the road, some of the population provides roadside services (service stations, feeding stations, hotel services). There is a petrol station (Coordinates: 49 ° 36'10 "N 73 ° 13'9" E), asphalt plant (Coordinates: 49 ° 36'11 "N 73 ° 13'34" E)

and Podkhoz – a camp for part-time farm workers (formerly belonged to Zhumabek village coordinates: 49 ° 35'56 "N 73 ° 13'52" E) located in the settlements area along the alignment. Figure 2.

At the moment, the Agency of Statistics of the Republic of Kazakhstanis unable to provide statistical data according to rural settlements; as a consequence, the information has been requested in the rural district akimat.

Figure5.1.9.2.LocationofKurminskoye and Zhumabek settlements.

At the exit from the village area, there are roadside service – "Zhibek Zholy" feeding station (Coordinates: 49°35'34"N 73°13'47"E), distance from the road is 50 meters, and Zhumabekskoye Water Reservoir (Coordinates: 49°35'23"N 73°12'56"E), distance from the road is 350 meters. "Sapar's" roadside service is located at a distance of 1.2 km along the alignment (Coordinates: 49°34'54"N 73°14'7"E).

There is an earth fill of rail road along the district alignment, which was used for coal transportation from Karaganda to Spassk copper smeltery. Originally coal was carried on camel carts, wagons were subsequently organized in 1915 made by "Sormovo" JSC. At this time, rail road is not in operation. (Coordinates: 49°33'56"N 73°14'55"E).

Spassk is a village in Abay District of Karaganda Oblast in Kazakhstan. It is included in Kurminskoye rural district and located 200 meters from M36 highway (Coordinates: 49°32'19"N 73°16'47"E). Former 45934 military base and current 75190 military unit are located in the village. There is a landmark of the village – a memorial to the victims of Stalinist repressions (Coordinates: 49°32'17"N 73°17'52"E) in the area of the settlement location. Spassk was one of the most terrifying camps of the Gulag system. Thousands of Gulag prisoners were buried in the Spassk graveyard. According to A.Solzhnitsin, 100 people died every day in the camp in 1949 because of severe conditions. The memorial is located at a distance of about 200 meters from the road. There is also a figure of a soldier located at a distance of 30-40 meters from the road (angular coordinates: 49°32'18"N 73 °17'29.1"E). There is a tank training area (Coordinates: 49°31'47"N 73°18'35"E) at a distance of 100-150 meters from the road.

In the 50-s of the XIX century, copper smeltery was built in Spassk. Its history is closely connected to Karaganda basin, the coal of which covered the needs of the plant. In 1907, the coal mines of the basin became the property of "Spassk Copper Ores Joint Stock Company" that was established in London by Jim Herbert. On May 11, 1918, V.I. Lenin signed a Decree of the RSFSR SNK on the nationalization of Spassk Copper Smeltery and other enterprises. At the end of the 1910-s, the copper smeltery was closed. (Figure 3)

Figure5.1.9.3.Locationof Spasskalong M36 highway

A large number of monuments to victims of road accidents were also arranged along the alignment. Most of these monuments were installed by relatives of the victims. Distance from the road is approximately 50-100 meters. The angular coordinates of the monuments location are given in *Appendix 1*.

The following fishery ponds assigned to the nature users are located in the territory of Abay District: Dzhartassk Water Reservoir (535 ha), Sherubay-Nurinsk Water Reservoir (3 076 ha), Samara Water Reservoir (7 ha), Zhumabek Dam (40 ha), Zhamanzhol Dam (90 ha), Koybas Dam (15 ha), Ayda Dam (15 ha), Dam No.1 (Shakhtinsk, 100 ha), Aktas Village Quarry (4 ha), Sand Quarry Dams (150 ha), Tikhonov Dam (80 ha), Semyannoye Dam (10 ha), Prospect Hole No.5 (45 ha), Kulagirsky k/ r (10 ha), Sopaksor Lake (10 ha), Sassykkol Lake (3 000 ha), M.Sarykol Lake (50 ha), Nura River (Ab., 50 km). The total area of water reservoirs is 7 237 ha.