

**Reconstruction of the Central-South corridor of the highway  
"Astana-Karaganda-Balkhash-Kapshagai-Altay" section of the  
highway "Frontier of the Russian Federation (to Ekaterinburg) -  
Altay"**

**Ministry of Investment and Development  
Republic of Kazakhstan  
Committee of Motor Roads**

**Loan No. 7681-KZ: Road development project "South-West".  
"Reconstruction of the highway" Kurty-Burylbaytal ", the  
corridor" Center-South ",  
SWRP-2295-2380-ICB (W) - 001 / 2016  
Lot 1 km 2295-2335  
Lot 2 km 2335-2380.**

**ENVIRONMENTAL MANAGEMENT PLAN**

**on the road development project "South-West".  
"Reconstruction of the highway" Kurty-Burylbaytal ", the corridor"  
Center-South "**

**Altay, 2018y.**

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## Abbreviations

World Bank - World Bank  
PPU - Bad weather conditions  
СНиП - Building codes and regulations  
Efficiency - Coefficient of efficiency  
CIS - Commonwealth of Independent States  
BCY - Concrete and sorting unit  
Checkpoint - Checkpoint  
CAD - Committee of Roads  
ДСУ - Crushing and Screening Plant  
KNS - Consultant for Construction Supervision  
OS - Environment  
EIA-Environmental Impact Assessment  
PMUVOS-Plan for monitoring and mitigation of environmental impact  
Environmental protection - Environmental protection  
EMP - Environmental Monitoring Plan  
Filling station - Petrol station  
PEC - Production Environmental Control  
PM - Production monitoring  
Tg. - Kazakhstan tenge (Currency of the Republic of Kazakhstan)  
MEP - Ministry of Environmental Protection  
MOTC - Ministry of Transport and Communications  
MPC - Maximum allowable concentrations  
MPE Maximum allowable emissions  
Remote control - Maximum permissible level  
ND - Normative documentation  
O & M - Operation and Maintenance  
Pollutants - Pollutants  
PMAV - Point of monitoring of atmospheric air  
PMC - Project Management Consultant  
Republic of Kazakhstan - Republic of Kazakhstan  
SPZ - Sanitary protection zone  
SanPiN - Sanitary rules and regulations  
GOST - State Standard  
State Scientific and Production Center for Land Resources and Land Management  
State Technical University - State Territorial Administration  
Solid Household Waste

## **1. . Introduction**

### **1.1 Project information**

In this project, one of the main issues under consideration in the field of environmental protection is the maintenance of the ecological balance and the restoration of the lost qualities of the natural environment, in the zone of ongoing construction of the highway, as well as the consequences for society.

Coordinated and approved in accordance with the established procedure, the materials of the EIA will serve as the basis for deciding on the economic necessity, environmental safety and social feasibility of investments in the construction of the elevated Highway.

The EIA includes the definition of the nature and degree of environmental hazard of all types of solutions proposed by the working draft during the construction phase.

The main objective of the EIA is to prevent environmental degradation, to develop measures that reduce the level of environmental hazard of the proposed economic activity.

The solutions of the working project are assessed by their impact on the air, water and land resources, flora and fauna and other environmental factors.

Assessment of the impact on the air basin is carried out by calculation methods with the help of various mathematical models and values of specific emissions. The amount of harmful emissions is calculated for different stages of production for the stage of construction.

In addition to assessing the impact on the air basin, the decisions of the working draft are assessed on their impact on water and land resources, flora and fauna and other environmental factors. When performing the impact assessment, the initial data is the information of the working draft, local and resource estimates.

### **1.1. Environmental Management Plan**

The World Bank's WB Safety Policy Principles state that the Environmental Management Plan (EMP), whose purpose is to develop measures to mitigate and manage the possible consequences that must be implemented during the project implementation: to avoid, reduce, mitigate or compensate for the negative impact on the environment.

In this regard, some measures have been taken to prevent and reduce the negative impact on the environment that were taken into account in the design project and additional recommendations for further prevention or mitigation, as reflected in the EIA and reflected in the proposed EMP.

## **2. The basic principles of EMP**

### **2.1 Methodology**

- The monitoring and reduction plan for the environment is prepared for all types of identified environmental impacts prior to the start of construction, operation and monitoring works.
- The methodology consists of the following stages:
  - identification of measures to reduce and protect the environment for each of the project activities and the environmental component;
  - ways to reduce, compensate and improve measures for each of the identified consequences and risks;
  - Development of a monitoring mechanism for proposed mitigation measures;
  - оценка бюджетных потребностей по смягчению последствий реализации проекта и мониторинговых мер;

- Definition of the responsibilities of various institutions involved in the project for the implementation and monitoring of mitigation measures.

The environmental monitoring and mitigation plan is prepared in accordance with the above criteria, and is presented in Annex-1 and Annex-2, with each of the components considered in the following sections. The plan for monitoring and mitigation of the environmental impact is included in all tender documents for the project and will become part of the contract for civil works. Strict implementation of the plan and adherence by the project management to adequate practices and construction standards will significantly reduce the negative impact of the project.

### **3. Mitigation measures**

This section includes the principles, procedures and mitigation measures that are necessary to ensure the most appropriate environmental mitigation and improve the plans applicable at different stages of the project implementation. In order to avoid and minimize the consequences of the project activity, management measures / plans are based on appropriate technological design, improvement or adjustment.

This plan was recommended to determine the actions to avoid and minimize / control the consequences arising from different phases of the project, i.e. before construction, during construction and operation, for each of the expected impacts, as described in the EIA report.

Mitigation measures have been developed to avoid or mitigate potential negative impacts.

### **4. Monitoring mechanism**

Monitoring of environmental components and mitigation measures during construction and operation is a key component of the environmental monitoring plan (EPM) to ensure environmental protection. The monitoring objective is: (1) to monitor changes in the environment at various stages of the project cycle, comparing with the baseline conditions; (2) management of environmental issues arising from construction and installation works through quality and reliable monitoring of compliance with environmental standards. The monitoring mechanism is designed for each specific type of impact and includes:

- Place of monitoring (places near the project activity, sensitive receptors or in the project impact zone);
- Means of monitoring, i.e. monitoring parameters and methods of control (visual inspection, consultations, interviews, surveys, field measurements or sampling and analysis);
- Frequency of monitoring (weekly, monthly, seasonally, annually or in the course of performing certain activities).

The monitoring program will also include regular monitoring of construction works to ensure they comply with environmental requirements, in accordance with relevant standards, specifications and an environmental monitoring plan. The purpose of such monitoring is to evaluate the effectiveness of mitigation measures taken and immediately formulate additional mitigation measures and / or modify existing ones aimed at meeting environmental requirements as needed during construction (Appendix-2).

In addition, in accordance with the requirements of the Republic of Kazakhstan and the World Bank, the Contractor develops an Environmental Management Plan. Thus, EMP is developed to comply with the safety rules established by the World Bank to prevent, minimize, mitigate or compensate for possible harmful effects; and also it is necessary to inform potentially affected people and to consult with the relevant organizations during the preparation and implementation of the project. This policy applies to all projects financed by the World Bank, including those relating to the private sector, and for all components of the project. The internal requirements of the procedures are described in detail and included in the sections of the Operation Manual, as follows: (i) selection and review of the main issues, from the very beginning of the implementation of the project and further during the whole the project cycle; (ii) assessment of possible impacts, preparation and compilation of mitigation measures, monitoring of the program and institutional mechanisms, and creation of conditions for the integration of the guarantee during the development and implementation of the project; (iii)

in the course of implementation of the project, consultations are prepared and implemented, and information is made available to potentially affected people in the form, manner and language, (iv) plans are communicated to the general public, with information being updated at different stages of the project cycle. Accordingly, this sequence is used in the development of the MCPA, as well as in the process of updating and preparing the MCPF. The SMME is designed to ensure compliance with the WB's security policy requirements. Environmental parameters that can be qualitatively and quantitatively measured and compared selected as "indicators" and recommended for monitoring during the implementation of the project and O & M stages. These monitoring indicators will be monitored continuously to ensure compliance with national standards or the World Bank and be compared with the baseline conditions established at the design stage. A list of indicators and their applicable standards for compliance are provided below:

- Air quality (Saint-Pierre and Miquelon), SO<sub>2</sub>, NO<sub>2</sub> and CO) - GOST of Kazakhstan
- Noise level - GOST of Kazakhstan
- Surface and groundwater quality - GOST of Kazakhstan
- The number of identified endangered species of wild animals and migratory birds - in comparison with the main environment

Environmental monitoring of construction performs oversight functions, the main purpose of which is to ensure compliance with EMP. Monitoring is a process that ensures that deviations from the EMP are not observed or can be corrected as soon as possible, and that any unforeseen consequences will be quickly detected and eliminated. Specific items of the EMP that need to be verified are included in the Monitoring Plan. During the environmental monitoring of construction, roadside areas will be protected from potential soil erosion, restoration of quarries and quarrying, placement of workplaces and material stores, concrete and asphalt plants especially located near natural resources, preservation of archeological and cultural heritage monuments, including cemeteries, public relations and security. The assessment of monitoring is conducted to assess the possible impact within the first 3 years after completion of the project. Regular monitoring of the condition of pavement, bridges, culverts, drainage structures and slope structures is important from an environmental point of view, but is developed as part of regular maintenance of roads. In addition to this activity, information about the places, type and consequences of accidents or accidents is required in cooperation with the traffic police. Recommended monitoring of air quality, noise and water, landscaping and landscaping and feedback is also included in the monitoring plan.

A monitoring plan and detailed information on monitoring the locations and performance indicators of the project at the construction and operation stages subject to environmental control are presented in Appendix-2.

## **5. Public awareness activities**

In accordance with the laws of the Government and WB requirements, the project requirements include:

- Throughout the entire construction period, organize meetings with stakeholders and NGOs and subsequently take into account their views when developing projects and plans. Issues and problems raised during the public meetings held at the technical and economic stage will be considered.
- The Local Citizens Council (community) conducts interviews with victims.
- Holding an open meeting, interviews in accordance with the legislation of Kazakhstan.

In order to comply with the above requirements, the following actions are planned:

Information on meetings will be made available to the public through:

- publications in the media
- publications in regional newspapers

## **6. Budget estimates**

The budget estimates are prepared for all mitigation and monitoring indicators within the MCPFM.

## **7. Institutional framework for the implementation of the Monitoring Plan and mitigation of the environmental impact**

The Contractor is responsible for the implementation of the Monitoring Plan and mitigation of the environmental impact during construction, in the first place, is responsible for monitoring and monitoring the implementation of this plan. For the implementation of the Environmental Management Plan, the contractor concludes a contract with an accredited laboratory, a solid waste export agreement, and also contracts with design organizations for the development of draft EIAs, MPEs and for the preparation of permits (Land Use Act, subsoil use contract. sanitary and epidemiological supervision, water use, emissions), etc. To employ one environmental specialist and one professional occupational health and safety specialist who will work in close cooperation with the environmental staff of the Construction Supervision Consultant (CSN) and the Almaty Aluminum Engineering Laboratory

. Under the plan of internal inspections, organize internal checks with a view to timely taking measures to correct the non-conformities identified during the audit. Implementation of the measures provided by the program of industrial environmental monitoring:

- 1) Follow the production instructions and regulations for environmental protection.
- 2) Fulfillment of the conditions for permission to issue into the environment.
- 3) Correctness of accounting and reporting on the results of industrial environmental control.
- 4) Compliance with fire safety rules.
- 5) Regular payments for pollution of the environment.
- 6) Monitoring the parameters of the technological process for the enterprise.
- 7) Control over compliance with requirements in the field of OS protection.
- 8) Compliance with the approved technical regime for production control
- 9) Technical condition of the operating equipment.
- 10) Compliance with the rules of Safety and Industrial Safety at the enterprise.
- 11) Monitoring of emissions of pollutants.
- 12) Providing reports on the program of industrial environmental control.
- 13) Continuous monitoring of technological processes that have a negative impact on the environment.
- 14) Cleaning of territories from garbage and utilization of industrial waste.
- 15) Regular control over the use of petroleum products.
- 16) Reclamation (technical - biological) of disturbed lands.
- 17) Exclusion of spills of oil products and used oils on the soil cover.

## **8. Project Management related to the impact on the environment**

17. The EMP was prepared in accordance with each identified impact and was presented in Annex-1. This EMP is divided into three parts, before construction, during construction and monitoring. Also, each part is divided into project activities to address these impacts. Each treatment action is divided into the following steps.

- Event
- Impact
- Measure of mitigation
- responsible for implementation
- supervisory authorities

## **9. Land acquisition**

The projected highway is located in the Zhambyl district of the Almaty region on the Almaty-Astana highway between the villages of Kanshengel and beyond the village of Aidarly.



The minimum distance to the nearest residential house of Kanshengel village is 260 meters from the northern side of the extreme source of emissions of harmful substances (road reconstruction).

The reconstructed route crosses two dry riverbeds of Kokbulaksei and Kurmansai rivers.

The construction will be carried out within the water protection zones and zones of the Kokbulaksey and Kurmansay rivers.

The existing motor road is a public highway of national importance and corresponds to the parameters of category II. The width of the roadbed is from 7 to 12 m. The height of the existing mound throughout the entire stretch varies from 0.0 to 2.5 m on average, and very rarely in depressions, logs to 3.0-4.50 m.

Laying slopes 1: 1.5; 1: 4.0. The width of the roadside is 3.0 m or more.

The existing roadbed is sprinkled from the side prirassovyh reserves. The curbs, slopes, and cuvettes are in satisfactory condition, overgrown, in places on km2312 + 800 (pc176 + 50), km2316 + 500 (pc213 + 80), km2330 + 500 (pc354 + 60) are blurred.

Ground zapolotna - sandy sandy loam, heavy loamy loamy, hard consistency, sandy silty slightly moist, all varieties of soils with gravel inclusion up to 10-20%.

The humus content is from 4483.3 to 6359.9 mg / kg (0.45-0.63%).

In the survey of the Zapolotnaya and the covering of the steppe formation (surface), the edges are identified on km164 + 200 on the left, km166 + 600 (to the left, to the right), km 168 + 200 (on the right).

Road clothing is represented by the following layers: - coating - black gravel with displacement on the road, - base - gravel-sand mixture.

Repair of the coating was carried out by means of a rough surface treatment device (SHPO).

Coverage on all extent has significant defects. The most characteristic defects are frequent deep transverse and oblique cracks, less often longitudinal ones, a grid of cracks - such as an alligator, a deep rutting of more than 20 cm, pits, crimps, large waviness, subsidence, frequent patches from patching. Absence of a transverse slope of the carriageway leads to stagnation of surface waters on the cover in the late autumn and early spring period and saturation of the soils of the working layer of the roadbed, which in turn leads to the formation of subsidence and subsequent destruction of the fracture.

The width of the coating varies from 6.8 to 9.0 m, the thickness of the coating is 5-25 cm.

The base is composed of gravel-sand mixture, natural not selected, according to GOST 25607-2009 correspond to mixtures C 2, C 7, C 11.

On the section km2299 + 000-2299 + 600 the cover is represented by the following layers: cold asphalt concrete with SHPO, laid on a black gravel cover, 8cm thick, in poor condition.

Taking into account the above-mentioned defects, not uniform thickness, width and insufficient strength of existing pavement, it is recommended to completely disassemble the existing pavement with subsequent use of the material from disassembly in pavement layers of junctions and turning areas.

On the projected site, existing artificial structures were surveyed, represented by culverts of various diameters in the amount of 40 pcs. All the artificial structures that were put into operation during the period of the 1970s were not reconstructed. Most of the culverts correspond to the loads on the 1st category road, but the condition of both pipes and strengthening works in the channel part and the slopes of the Zapolotna embankment require replacement.

The main technical parameters of the automobile used in designing in accordance with the current norms of SNiP RK 3.03-09-2006 "Roads" are listed in Table 7. Roads.

### Main technical specifications

№ п/п	Name of parameters	Standards	
		According to the SNiP RK 3.03-09-	Accepted
1	Road Category	I-б	I-b
2	Intensity of movement for the future:	СВЫШЕ 14000 легк. авт/сут	Over 14,000 lungs a day / day
3	Estimated speed, km / h	120	120
4	Number of lanes, pcs.	4	4
5	Lane width, m	3,75	3,75
6	Width of carriageway, m	15	15
7	Width of pavement, m	18,5	18,5
8	Width of shoulder, m	3,75	3,75
9	Width of dividing strip without fences, m	3	3
10	The least width of the reinforced curb strip, m	0,75	0,75
11	Width of the road bed, m	25,5	25,5
12	Transverse slope of the roadway and fortified strip, ‰	15	15
13	Transverse slope of the roadway and fortified strip,	40	40
14	Transverse slope of the curb, ‰	40	40
15	The greatest longitudinal slope, ‰	250 450	250 450
16	The smallest radii of the curves, m: - in plan - in the longitudinal profile: convex concave	800 15000 5000	800 15000 5000
17	Bends with a single-track profile of the carriageway at the radii of the curves in the plan, m	less than 3000	less than 3000

The general direction of the route is southeastern. The length of the route was 40040 m.  
 The main indicators of the route:  
 The length of the route is 40040.19 m  
 The length of the curves is 3687.29 m.  
 The length of the straight lines is 36352.9 m.  
 Number of rotation angles - 8 pcs.,  
 The minimum rounding radius is 800 m.

Visibility in the plan is assured.

*Power supply* - for the period of construction there is no electricity demand, all mechanisms operate on diesel fuel.

*Heat supply* - in the cold period of the year heating of temporary administrative and domestic facilities by electric heaters.

For the period of operation, heat supply is not required.

*Water supply*. Technical water supply is planned to be received from the river Kurty, partially from the artesian well located in the village of Kanshengel, the well is self-pouring, its flow rate is 0.5 liters / sec. Drinking water supply - a well at 8 km a / d Kanshengel - Topar to the right 500m, its debit is 0,11 / sec. To ensure the technological process during construction, water of technical quality is required. To provide household workers, water of drinking quality is required.

### 10. Climatic characteristics.

The absolute maximum of air temperature is + 47 ° C, the absolute minimum is -46 ° C.

On the totality of all the forming factors in the system of construction and climatic zoning, the area under study refers to the subarea-IIIB for SNIIP RK 2.04 -01-2010.

The climate of the region is sharply continental and arid. Winter is cold, but not long, with a non-stable snow cover. Hot summer. The area belongs to the zone of insufficient and unstable hydration.

Road-climatic zone (SNIIP RK 3.03.09-2006) - V. Average air temperatures:

- Year - +7.9 °C; -The hottest month (July) - +25,4 °C;

- The coldest month (January) - -11.7 °C; -Temperature of the coldest five-day period:

security of 0.98 -34 ° C, security of 0.92 -31 ° C;

-Temperature of the coldest days: 0.98 -37 °C, 0.92 -35 °C.

Среднемесячная температура наружного воздуха, °C

table 2

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Год
Average monthly and annual	-11.7	-9.5	0.7	10.9	17.2	22.8	25.4	23.8	16.5	8.4	-1.1	-8.2	7.9

The normative depth of seasonal freezing of soils,

- loam and clay - 126; - sandy loam, small and silty sands - 155; - Medium sands, large and gravelly - 166;

- coarse-grained soils - 188. The average annual precipitation is 243 mm, incl. in the cold period - 95 mm.

### Winds (m / st Kurt)

The name of indicators	Month	One. Meas.	Rumbo indexes							
			C	CB	B	IOB	IO	IO3	3	C3
Repeatability of winds	January	%	14	1	2	43	17	4	4	15
average speed	January	m / s	3,4	3,4	4,3	4,6	3,1	2,5	3,3	3,2
Repeatability of winds	July	%	24	11	4	23	9	5	7	17
average speed	July	m / s	3,9	4,5	3,2	3,8	3,4	4,2	4,5	4,2

Medium-upper-Quaternary sediments take part in the geological structure. The thickness of Quaternary sediments almost everywhere exceeds 200-300 m. Middle-Upper-Quaternary deposits are represented by sands of different species, gravel soils, sandy loam, loams, clays. Modern formations are represented by the soil-vegetation layer.

Underground waters passed by excavations to a depth of 3.0-7.0 m were not opened. The only exception is the section at km2325 + 780 (dry land) where the groundwater is opened

at a depth of 1.0 m and confined to the zone of gravel sand. The established level of groundwater during the survey, marked at a depth of 1.0m. The groundwater table corresponds to the maximum. Underground waters are non-pressure. The amplitude of groundwater fluctuations is  $\pm 1.0$  m.

The supply of groundwater is due to the infiltration of spring snowmelt and rainwater.

Underground waters have weak sulfate aggression to concrete of mark W4, and a weak degree of aggression to the reinforcement of reinforced concrete structures with periodic wetting. Non-aggressive to concrete on sulfate-resistant cement.

The route is laid in the Ili-Balkhash-Alakul desert basin. This vast province is located in the subzone of the middle desert and in the piedmont semi-desert in the southeast of Kazakhstan. In the west, the province is bounded by the Chu-Ili mountains, in the north by the Central-Kazakh melkosopochnikom, in the east by the Barlyk and Dzhungar Alatau ridges, and in the south by the Zailiysky Alatau. The southern part of the Ili-Balkhash-Alakol depression is the intermontane basin of the Ili River.

Directly the route passes along the semi-desert foothill semi-desert sloping plain (Jusundala) with a general bias towards the Ili River, which was crossed by the bunkans.

The constant and the nearest watercourse is r. Kurty. The Kurta River is the last left tributary of the Ili River, the main waterway of southeastern Kazakhstan. The length of the river is 123 km, originating on the northern slope of the Chu-Ili Mountains, lower reaches the Ili Basin, feeding rain, snow and soil. The river is shallow, used for irrigation, a reservoir has been created.

Soil-forming rocks are mainly eluvial-proluvial-deluvial deposits represented by loam, sandy loam and sand. The soils of the semidesert steppe are represented by clayey brown soils, serozems with a small content of carbonates. Soils are practically devoid of humus, which makes it difficult to conduct economic activities.

Soil-vegetation cover is very diverse. In the plains - semi-desert and desert, grass-grass (fescue-feather grass) vegetation, the spring is characterized by ephemerals and ephemeroids on clayey burozems

From woody vegetation with proper care in the villages grow karagach, poplar.

## **11. Engineering-geological conditions.**

The route is laid in the Ili-Balkhash-Alakul desert basin. Directly the route passes along the semi-desert foothill semi-desert sloping plain (Jusundala) with a general bias towards the Ili River, which was crossed by the bunkans.

Pristratsovaya strip is composed of the following varieties of soils: IGE-0 soil-fertile layer (to be removed) (9c). IGE-1 sandy loam with a solid consistency, with gravel up to 10% (36b). IGE-2 sandy loam with a solid consistency, with gravel up to 20% (36c).

IGE-3 sandy loam silty solid consistency, with gravel from 10 to 20% (36b, 36b). IGE-4 is a silty sandy loam, with gravel up to 10% (29b).

IGE-5 is a silty dusty sand, with gravel up to 20% (29c).

IGE-6 loam is heavy, sandy, solid, with gravel up to 10% (35c). IGE-7 loam is heavy sandy hard, with gravel up to 20% (35g). IGE-8 loam is light sandy hard, with

Gravel to 10% (35c). ИГЭ-9 loam is heavy silty, hard, with gravel up to 10% (35в). ИГЭ-10 clay light sandy solid, (8d).

ИГЭ-11 песок gravelly slabovazhny, average density, with lenses of sandy loam, loam, with lenses of cemented sand (29в).

IGE-12 sand large coarse, medium density, with gravel up to 20% (29c). IGE-13 sandy small mossy, with gravel to 15% (29c).

IGE-14 gravel is weakly moist, with sandy loamy loam, loam (6a).

IGE-15 conglomerate on lime cement, weathered, low-strength (18a). IGE-16 medium-sized sand is weakly moist, with gravel up to 10% (29a). The moisture content of the soils of the pritrace belt is 3.1 - 7.5%, and the optimum humidity is 8.0 -

13,0%, which is 5-6% lower than required, it follows that it is necessary to erect a zapolotno in the late autumn, winter and early spring periods.

The coefficient of filtration of sands in the compacted state is 0.0036-0.151 m / day. Salinization of soils - from non-saline to sulphate mean

The degree of aggressive effect of soils on concrete on ordinary Portland cement from non-aggressive to strongly aggressive and from non-aggressive to slightly aggressive to concrete on sulfate-resistant cement. The chloride content in terms of Cl from non-aggressive to medium aggressive.

Groundwater passed by excavations with a depth of 3-7.0 m has not been opened, the exception is the section at km 2325 + 780 (dry dol), where ground waters are opened at a depth of 1.0 m. The established level of groundwater is 1.0 m. The amplitude of groundwater fluctuations is  $\pm 1.0$  m.

The degree of aggressive impact of groundwater on the concrete of the brand on water permeability W4 is slightly aggressive, according to the chloride content in terms of chlorine with occasional wetting is slightly aggressive. It is non-aggressive to sulfate-resistant cement.

Type of terrain by nature and degree of humidification -1

On the section km2325 + 750 (пс306 + 00) the pipe 2x2м 2hochkovaya, the apron is diluted to a depth of 1.5-2.0 m, with the release of groundwater, a foundation pit 10x20 m was formed, with the expansion of the excavation, it can serve as a source of technical water supply.

Corrosive aggressiveness of soils in relation to carbon steel - medium-high.

The degree of corrosive aggressiveness of soils with respect to the aluminum sheath of the cable from low to high, to the lead sheath of the cable is from low to high (according to laboratory data LLP "Ecohydrochemical" and "KazHydro").

Within the offshore strip, taking into account the nomenclatural types of soils, their consistency, salinity, 16 engineering-geological elements were identified, the characteristics of the building properties of soils are shown in the corresponding sheet and are reflected in the soil part of the longitudinal profile.

## 12. Plant and animal life

The vegetation of the territory under consideration is characteristic of the arid steppe-desert zone and is represented by gray-woolly deserts with the participation of keireuk and boyalych, grassy vegetation is meager. Natural vegetation is developed in the floodplains of rivers and streams and in flat areas and is represented by floodplain forests, bushes;

Woody vegetation is represented by forest belts along the existing motorway, mostly by carobachs and poplars, less often bushes, jida, willow and fruit trees.

The fauna is characteristic of the steppe desert zone. From mammals the most common are rodents - ground squirrels, hamsters, hares, jerboas. Of predators live the fox, the hawk. Many turtles, snakes, lizards and arachnids. Of birds in the steppes nest eagles, moons, kestrel, passerines, wild partridges; near the rivers and lakes there are many different waterfowl.

Because of the low population density and the reduction of arable land, the living conditions of animals and birds are natural.

### **13. Specially Protected Natural Territories**

The territory of the reconstruction of the highway passes through the territory of the Zhusandalinsky protected area.

Organized by: Resolution of the Government of the Republic of Kazakhstan of March 15, 2001 No. 382 "On the Organization of State Protected Areas of Republican Significance".

Location: Almaty region - Balkhash, Ili and Zhambyl districts; Zhambyl region - Kordaysky, Moyynkumsky, Shuya districts.

Area: 2 757 500 hectares.

Preset modes: Preserved mode (80 660 ha), customized mode (353 236 ha), adjustable mode (2 323 604 ha).

Biodiversity: Vegetation - 19 species, of which endangered species - 4, rare species - 14, widespread - 1. Animal life - 223 species, of which mammals - 44, birds - 179 (migratory, nesting, sedentary, wintering).

### **14. Emergency response plan**

The contractor "SPIK Accord" in conjunction with the Department of Emergency Situations of the Republic of Kazakhstan should put in place emergency response plans and procedures to limit and reduce damage from accidental spills, snow, etc. This requires the establishment and development of links and a response system, to minimize the consequences of these situations, and to minimize the time required to respond to these situations in order to protect people, property and natural resources. The Contractor must submit an approved Safety Plan against accidents and dangerous chemical spills. The plan should also contain details of detours in case of an emergency. The contractor in case of emergencies reports the situation to the Department of Emergency Situations of the Republic of Kazakhstan, as well as informs the Almaty State University.

### **15. Reporting on the implementation of IEE and TEM.**

The contractor, in cooperation with an environmental specialist, should prepare a monthly status report on the implementation of the EMP. Such reports should contain information on the main activities during the reporting period, mitigation measures implemented, and any publications on the issues that have arisen with suppliers, local offices, affected societies, etc. The Contractor's monthly report on the status should be submitted to the World Bank, KNU, PMC, Sanepid Supervision Department, Department of Ecology JSC, MES, Land Resources Department, Natural Resources and Regulation Department, local tax authority. The Contractor shall fully comply with the reporting requirements of the IEE and TEM with indication of sites and measures taken. The monthly report should include the results of the implementation of IEE and environmental monitoring, as well as the results of site visits. The report should be submitted during the first week of each month, quarterly reports on IEE and TEM should be submitted before the 7th day following the reporting month of Article 4.21 FIDIC. A report is immediately submitted in case of environmental pollution and proposed mitigation measures. The contractor shall establish and maintain procedures for determining the responsibilities and authorities for identifying and studying, taking measures to mitigate the environmental impacts.

### **16. Conclusion**

Construction works can become a temporary cause of the negative impact on the environment. Temporary construction work could have more impact than activities associated with permanent work. For this reason, the environmental management and monitoring program is designed for both temporary and permanent works covering construction.

Correct and timely implementation of various EMP conditions in terms of mitigation measures

monitoring and capacity building will minimize the adverse environmental impacts associated with the construction and operation project. To ensure that the adverse impact of the project is properly implemented, the tender and contract documents for the construction work for the entire project should include an EMP. Regular monitoring and reporting on the implementation of the EMP should be undertaken to ensure that mitigation measures are implemented as necessary and to create the conditions for developing and implementing corrective actions as necessary.

The Environmentalist of the Executor is also responsible for the implementation of the EMP. Capacity-building programs are proposed for capacity-building in the legal and economic divisions (for environmental issues).

The project will have a common beneficial effect, as well as some negative effects that will be carefully monitored and mitigated. Thus, compliance with the EMP will fully meet the requirements of the World Bank as well as the Law of the Republic of Kazakhstan "On Subsoil and Subsoil Use", the Land Code, the Environmental Code of the Republic of Kazakhstan.

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# Appendix 1



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**Annex - 1: Environmental Management Plan**

Environmental	The main structural and associated elements of the road and their location	Kinds the alleged impacts	Turnaround time	Mitigation measures impact on the environment	Responsible for conducting of work
the elements	Reconstruction of the Central-South corridor of the highway "Astana-Karaganda-Balkhash-Kapshagai-Altay" section of the highway "Border of the Russian Federation (to Ekaterinburg) - Altay", km 2295-2335.	Exclusion of land from agricultural turnover	Prior to the commencement of construction work	Registration of land use rights, article 31,43,44 of the Land Code of the Republic of Kazakhstan. Act on the right of regular use	Employer Committee of Roads of the MID RK
	Objects of temporary use: - construction sites - water intake sites:	Temporary occupation of lands	Prior to the commencement of construction work	The contractor must ensure that all necessary and get all the necessary permits documents, registration of the right to temporary land use Articles 32, 36, 43 of the Land Code of the Republic of Kazakhstan (Act) and Technical Specification P 100, п104. The lease contract of the shift camp has been concluded Arrangement of the access road to the surface of the site, Land lease agreement	Contractor  Engineer-  Ecology
	Careers absent				
Land resources	In the geological structure of the highway route, alluvial-  The proluvial deposits represented by sandy loam, loam, pebble, rocky soils. Loam is light silty, lying between on the profile, light	Destruction, deterioration and contamination of soil cover products production and waste production.	During the production period	Removal of the fertile soil layer of the CSP (vegetative soil) storage and storage in stacks for further use during reclamation. p.100, p.400,500 "Technical specifications". Strengthening the slopes of the earth. canvas and existing gullies in order to prevent soil erosion. Exclusion of flooding of territories, adjacent to the road, soil degradation from transport pollution. Conducting monitoring of soil quality according to The Environmental Monitoring Plan and the conclusion of	Contractor  Engineer-  Ecology

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Environmental	The main structural and associated elements of the road and their location	Kinds the alleged impacts	Turnaround time	Mitigation measures impact on the environment	Responsible for conducting of work
	<p>brown, macroporous, hard, semi-solid consistency. Between the lower part of the section, loam-but-brown-colored, cloddy, semisolid to a turgid consistency with</p> <p>including gravel and pebbles up to 25%. A silty dust with gravel and pebbles lies at the end of the route in the form of separate</p> <p>interlayers and lenses, the color of sandy loam is brownish-gray. In floodplains and river valleys, and</p> <p>also foothill part pebble soil with sandy-sandy loam filler in an amount of up to 40%. The clastic material is well and medium-hulled and consists mainly of sedimentary rocks.</p> <p>The gritty soil - eluvium, occurs in a mountain valley, forming the bottom and its slopes,</p>			<p>a contract for its conduct with a specialized organization. Elimination of the spillage of oil products and waste oil on the soil cover.</p> <p>Park the road construction equipment only in specially designated places. Implementation of reclamation of disturbed lands.</p> <p>Cleaning of territories from debris and waste disposal.</p>	

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Environmental	The main structural and associated elements of the road and their location	Kinds the alleged impacts	Turnaround time	Mitigation measures impact on the environment	Responsible for conducting of work
	<p>The filler of the soil is sandy loam. Rock the soils composing the mountain mass consist of interbedding: silicified-shales, silicified sandstones and conglomerates with their calcareous cement.</p> <p>Rocky soils are strong, slightly weathered.</p> <p>Underground waters with depths of 1-15 m are not opened.</p> <p>The highway "Khorgos - Almaty - Shymkent - the border of the Republic of Uzbekistan" Section 705-742 km, bypass road, construction sites.</p>				
The air environment	Reconstruction of the Central-South corridor of the highway "Astana-Karaganda-Balkhash-Kapshagai-Almaty" section of the highway "Frontier of the Russian Federation (to Yekaterinburg)-Almaty, km 2295-2335.	Air dust and pollution by exhaust emissions: CO, NO2, SO2, hydrocarbon, soot	During construction	Systematic dedusting with water. Transportation of materials is carried out in a closed caravan. Setting of signs, speed limit movement. Application of high-quality fuel. Conduct environmental monitoring under the Treaties with Sanepidem authorities supervision or independent accredited laboratories, according to the Environmental Monitoring Plan.	Contractor

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Environmental	The main structural and associated elements of the road and their location	Kinds the alleged impacts	Turnaround time	Mitigation measures impact on the environment	Responsible for conducting of work
				Develop an EIA, obtain a conclusion of state expert examinations, obtain a permit for emission of emissions in all work areas in accordance with Article 69 of the Ecological Code of the Republic of Kazakhstan. When laying asphalt concrete mixtures containing toxic hydrocarbons, it is necessary to ensure a uniform technological rhythm of operation of machinery and transport in the working area. Unloading of asphalt-concrete mixtures is carried out only in receiving bunkers of asphalt pavers. Compliance with the repair schedule for machines. Regulation of traffic. Strict adherence to sanitary norms SanPiN № 3076 from 18.09.2004 "Requirements for atmospheric air in populated areas" SanPiN "The content of MPC in the air of the working area No. 841 of 03.2004.	
	Settlements located along the reconstructed highway :. Distance to housing from 100 meters.	Noise, vibration and air pollution	In the course of construction work.	Monitoring of the state of roads and compliance with "Requirements for atmospheric air in populated areas" SanPiN 3076 dated 18.09.2004 "Content of MPC in the air of the working area No. 841 of 03.2004." According to the Environmental Monitoring Plan, before starting construction work, it is necessary to perform air quality control, to determine basic indicators air, noise and vibration according to P100, paragraph 106 "Technical specifications" In the area of locating settlements at a distance of less than 200 m	Contractor

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Environmental	The main structural and associated elements of the road and their location	Kinds the alleged impacts	Turnaround time	Mitigation measures impact on the environment	Responsible for conducting of work
				from the working area, work only during the day (8-18 hours). Placement of plants is performed on sound-absorbing sites or in tents (compressor), to use protective covers and hoods when working road-building equipment. Workers should be provided with noise protection in areas with a noise level of 85 dBA. Restriction of speed of movement of a cargo transport in settlements. Control over the optimal mode of construction equipment. Monitoring the noise level (should not exceed the sanitary standards dBA established for settlements and the work zone by the Ministry of Health of the RK, order No. 139 of March 24, 2005.	
Water environment	<p>Water bodies located in close proximity and crossing the road construction site:</p> <ul style="list-style-type: none"> <li>- reservoir in the village of Akzhar.</li> <li>- Reservoir in with. Rabat</li> <li>-R. Badam</li> </ul> <p>water intake sites:</p> <p>Work camps and work areas for drinking water supply: Road, CBZ, ABZ.</p>	Pollution of the water environment in the construction of roads, bridges, culverts, water intake for technical needs	В процессе проиводства работ.	<p>Surface water sources are monitored for water quality under agreements with the sanitary epidemiological supervision or independent accredited laboratories in accordance with the Environmental Monitoring Plan. The quality of surface water sources must comply with the "Sanitary and epidemiological requirements for water sources, domestic and drinking water supply, places of cultural and household water use and safety of water bodies" of July 28, 2010 № 554 Issue a permit for water use. The device of water treatment facilities at the discharge of water from the road and bridges. In case of presence in sewage waters oil products and oils to clean the water intake wells. Water abstraction for technical needs only on</p> <p>equipped water intakes, in places coordinated with the bodies of supervision of water sources. Placement of construction sites for the construction of bridges,</p>	Contractor

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Environmental	The main structural and associated elements of the road and their location	Kinds the alleged impacts	Turnaround time	Mitigation measures impact on the environment	Responsible for conducting of work
				parking of road machinery and vehicles in the coastal zones of water protection zones is not allowed. The work in the water protection zone is allowed only with the permission of water protection and sanitary-epidemiological authorities. Washing of vehicles and road-building machinery should be carried out only in designated locations equipped with treatment facilities. Pollution of watercourses by industrial and household garbage is not allowed. To prevent water erosion, it is necessary to strengthen the slopes and bottom of channels of culverts. Water used for drinking needs must have a sanitary epidemiological conclusion.	
Flora and fauna	oad and all work areas	Damage, destruction, pollution of trees and shrubs and habitats of animals	During the production period	Obtaining a permit to cut down tree and shrub vegetation from the Customer in bodies of the State Forestry Administration. Restoration of vegetation by biological reclamation. To reduce the impact on the flora, it is necessary to dust the territory of working areas. To skip livestock, it is necessary to equip the cattle runways and install road signs warning of the probability of collision with animals. Moving of road machinery should be made no closer than 5 meters from the trees.	Contractor
Earth, air, water, soil cover	Construction sites, CBZ, ABZ.	Dusty, Deteriorating Air, Pollution почвы, Шумовое Impact Pollution water sources of	During the production period	Obtaining permits: The right to use the land, the contract for Subsoil use / Environmental passport of the enterprise Permission of Gostehnadzor The Sanitary and Epidemiological Supervision permit the development of an EIA, the draft MPE and the permit for emissions of Art. 69 of the Environmental	Contractor

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Environmental	The main structural and associated elements of the road and their location	Kinds the alleged impacts	Turnaround time	Mitigation measures impact on the environment	Responsible for conducting of work
				Code of the Republic of Kazakhstan. Permission for water use, re-cultivation project. Environmental monitoring of toxic gas emissions, dust generation, noise and vibration in terms of equipment use, as well as soil contamination, should be carried out in accordance with the Environmental Monitoring Plan. Control of the technological process of the enterprise, systematic monitoring of the storage of bitumen and building materials, prevention of spillage, construction waste and production waste are stored in specially designated places with subsequent export to the landfill. The water for drinking needs is stored in hermetically sealed containers in a strictly designated place closer than 75 m from the working area, has a quality certificate. The contractor is responsible for the sanitary conditions in the workplace. The cement bunker in the concrete plant must be equipped with the necessary filters, which must be regularly cleaned or updated. In the technological process of crushing crushed stone, constant water irrigation is conducted.	
Storage fuel and chemical substances	Production base at km 2345.	Soil pollution, air, probability of a fire	During the production period	Storage of all types of fuel and lubricants is carried out in hermetically sealed containers with fencing and fire equipment. Refueling of road-building equipment is made by the fuel-refueling company "mobile filling station" having a certificate of compliance and permission for the transport of dangerous goods. Not allowed spill fuel and oils. Regular monitoring of the use of fuels and lubricants is carried out. In case of spillage of oil products, the place of the strait is filled with sand,	Contractor

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Environmental	The main structural and associated elements of the road and their location	Kinds the alleged impacts	Turnaround time	Mitigation measures impact on the environment	Responsible for conducting of work
				collected in a special container and transported to the designated place. All specialized machines must be equipped with a container with sand, tray, shovel. Going to a special container and taken to a designated place. All specialized machines must be equipped with a container with sand, pallet, shovel.	
Waste production	Objects of production	Pollution and littering of the construction site shift camps, working area	During construction	Construction and household garbage, production waste are stored in strictly designated areas. Utilization of garbage and production waste to the landfill site in accordance with the Agreement and permit	Contractor
Social environment and links with the public	Reconstruction of the Central-South corridor of the highway "Astana-Karaganda-Balkhash-Kapshagai-Almaty" section of the highway "Border of the Russian Federation (to Ekaterinburg) - Almaty", km 2295-2335.	Zagazovannost, The dust, Noise, vibration, Violation socially, conditions	During the production period	Prior to the commencement of construction work, the Contractor, in conjunction with the Customer and local authorities, conducts public hearings on the construction project for assessing the environmental impact and socio-economic situation of the population. Provide an optimal mode of operation of vehicles and road construction equipment. Regularly conduct dedusting a) d in populated areas to ensure the safety of residents of settlements in places of work to establish signs of traffic that regulate the speed and direction of movement of vehicles. Fences of the working area are installed and pedestrian crossings are established. Videoconferencing boards are installed, where the name is indicated organization, leading work, location office and contact telephones. Environmental monitoring of air, water sources, soil cover, noise (according to the monitoring schedule). All	Contractor



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Environmental	The main structural and associated elements of the road and their location	Kinds the alleged impacts	Turnaround time	Mitigation measures impact on the environment	Responsible for conducting of work
				claims and proposals of the population are registered and their implementation is reported to the public. In populated areas, only work in the daytime	
Natural and Historical and architectural monuments	Reconstruction of the Central-South corridor of the highway "Astana-Karaganda-Balkhash-Kapshagai-Almaty" section of the highway "Border of the Russian Federation (to Ekaterinburg) - Almaty", km 2295-2335.	Destruction and damage	During the production period	all research and development (R & D) work on and historical and cultural heritage located on the site. A technical report on the results of research. Reconciliation of the interests of enforcement agencies. Conducting a historical and archaeological survey. Monuments investigated for their withdrawal from the list of Cultural Heritage Monuments.	Contractor
Reporting by implementation of The Protection Plan environment and environmental monitoring of		Security Compliance requirements Environmental Legislation, Minimization impacts production processes of the nature user on the environment and health rights	During the production period	The contractor shall fully comply with the requirements of the IEE and TEM reporting with the sites and measures taken. The monthly report should include the results of the implementation of IEE and environmental monitoring, as well as the results of site visits. A report is immediately submitted in case of pollution of the natural environment and planned mitigation measures. The Contractor shall establish and maintain procedures for determining liability and authority to identify and study, take measures to mitigate the impacts on the Environment.	Contractor

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## Appendix – 2

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**Appendix - 2: Environmental Monitoring Program**

Options	Location:	Amount of points	Defined parameters	Frequency	Responsible body	
					Executor	Head of
1	2	3	4	5	6	7
Control pollution atmospheric air	Road construction (km 2295 km 2380)	10-pc.	Nitrogen dioxide Carbon monoxide soot Ultimate hydrocarbons Dust inorganic Sulfur dioxide	1 time per month	RSE AO Center for Sanitary and Epidemiological Expertise	The Contractor. Environmental Engineer
	Work camp-km 2345	2-pc	Nitrogen dioxide Carbon monoxide soot Ultimate hydrocarbons Dust inorganic Sulfur dioxide	1 time per month		
	Concrete Batching Plant, Asphalt plant	3-pc	Nitrogen dioxide Carbon monoxide soot Ultimate hydrocarbons Dust inorganic Sulfur dioxide	1 time per month		

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Options	Location:	Amount of points	Defined parameters	Frequency	Responsible body	
					Executor	Executor
1	2	3	4	5	6	7
Control of water resources	Open water bodies located in the immediate vicinity of the road construction site and crossing the road: river Kurty km 2377 + 500	3pc	pH, sodium + potassium, potassium, calcium, magnesium, copper, zinc, lead, manganese, arsenic, phosphates, chromium, iron, chlorides, sulfates, ammonium nitrogen, nitrates, fluorides	1 time per month	RSE AO Center for Sanitary and Epidemiological Expertise	The Contractor. Manager-ecologist
	Shift camp. ABZ.	2pc		1 time per month		

Options	Location:	Amount of points	Defined parameters	Frequency	Responsible body	
					Executor	Executor
1	2	3	4	5	6	7
Monitoring of noise and vibrations	CBP	5pc	Noise and vibration	1 time per month	RSE AO Center for Sanitary and Epidemiological Expertise	The Contractor. Manager-ecologist
	laboratory	5pc	Noise and vibration	1 time per month		
	On the border of settlements.	5pc	Noise and vibration	1 time per month		
Radiological monitoring	On production sites: CBP	8pc	Мощность гамма излучения	1 time per month	RSE AO Center for Sanitary and Epidemiological Expertise	The Contractor. Manager-ecologist

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Контроль почвенного покрова	On the border of the SPZ ind. sites CBZ. At control points along the road.	10pc	pH, dense residue salts, oil products	1 time per month	RSE AO Center of Sanitary-Epidemiological Expression	Подрядчик . Менеджер-эколог
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1. Production Environmental monitoring is carried out at enterprises, organizations and other economic entities in accordance with Article 132 of the Environmental Code of the Republic of Kazakhstan as of 09.01. The purpose of the Monitoring is to identify the background indicators of the soil condition in areas exposed to man-made impact.

2. The sampling points and the measurement locations shall be determined by the Contractor in accordance with Art. 106 "Technical specifications"

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## Appendix – 3

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**Annex - 3: Schedule for control of emissions of pollutants into the atmosphere**

№ contact role Noah points	Place of measurement	Controlled substance	Periodicity control	Periodicity control in the periods- NMU times / day	Standard emissions of MPEs		By whom carried out control	Methodology holding control
					г/с	мг/м <sup>3</sup>		
1	2	3	4	5	6	7	8	9
T.1 T.2	Road construction (on the border of the SPZ)	Nitrogen dioxide, carbon monoxide, carbon black Ultimate hydrocarbons Dust inorganic Sulfur dioxide	1 time per month				Accredited laboratory	According to approved methods
T.1 T.2	Construction site (on the border of the SPZ)	Nitrogen dioxide, carbon monoxide, carbon black Ultimate hydrocarbons Dust inorganic Sulfur dioxide						According to approved methods
T.1 T.2	CBP.	Nitrogen dioxide, carbon monoxide, carbon black Ultimate hydrocarbons Dust inorganic Sulfur dioxide						According to approved methods
T.1 T.2	Camp (on the border of the SPZ)	Nitrogen dioxide, carbon monoxide, carbon black Ultimate hydrocarbons Dust inorganic Sulfur dioxide						According to approved methods
T.1 T.2								According to approved methods
T.1 T.2								According to approved methods

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## Appendix – 4



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#### Appendix - 4: Wastewater Quality Control Schedule

№ п/п	No. of water discharge, category of sewage	The place of sampling (wastewater receiver, blast hole, water intake)	Controlled substance	Периодичность контроля	Кем осуществляется контроль	Методика проведения контроля
1	2	3	4	5	6	7
1	Water discharge №1 - industrial-household wastewater	Main camp, main storage No.1	Suspended substances COD Chlorides Sulphates Phosphates APAV	1 time per month	Accredited laboratory	According to approved methods
2	Water discharge №1 - industrial-household wastewater	Main camp, main storage №2	Suspended substances COD Chlorides Sulphates Phosphates APAV	1 time per month	Accredited laboratory	According to approved methods
3	Natural water  (open reservoirs located in the immediate vicinity of the road construction site and crossing the road)	Kurtinskaya Reservoirs	pH, sodium + potassium, potassium, calcium, magnesium, copper, zinc, lead, manganese, arsenic, phosphates, chromium, iron, chlorides, sulfates, ammonium nitrogen, nitrates, fluorides	1 time per month	Accredited laboratory	According to approved methods

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## Appendix – 5

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**Appendix - 5: Schedule of control of the norms of physical factors at control points**

Source # Checkpoint No.	Place of measurement	Controlled substance	Периодичность контроля	By whom carried out control	Methodology holding control
1	2	3	4	5	6
T.1 T.2	Asphalt plant (km 2345)	Noise and vibration	1 time per month	Accredited laboratory	According to approved methods
T.1 T.2	r.Kurty during road works	Noise and vibration	1 time per month	Accredited laboratory	According to approved methods
T.1 T.2	At the border of settlements	Noise and vibration	1 time per month	Accredited laboratory	According to approved methods
T.1 T.2	Overpass for travel of agricultural machinery	Noise and vibration	1 time per month	Accredited laboratory	According to approved methods

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## Appendix – 6

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**Appendix - 6: Schedule of internal audit schedule**

<b>№</b>	<b>Type of check</b>	<b>Frequency of inspections</b>	<b>Method of conducting</b>	<b>Location</b>	<b>Responsible for the execution of inspections</b>
1	Checking the regularity of air sampling	Monthly	Verification of the accounting documentation	Territory of the enterprise	Manager-ecologist
2	Verification of staff compliance with the rules for waste management, prevention of the spread of waste through the territory of the enterprise	Monthly	Visual	Places (platforms, containers) of waste storage	
3	Verification of the correctness and regularity of reporting on the implementation of the MCPFM	Monthly	-	-	Manager-ecologist

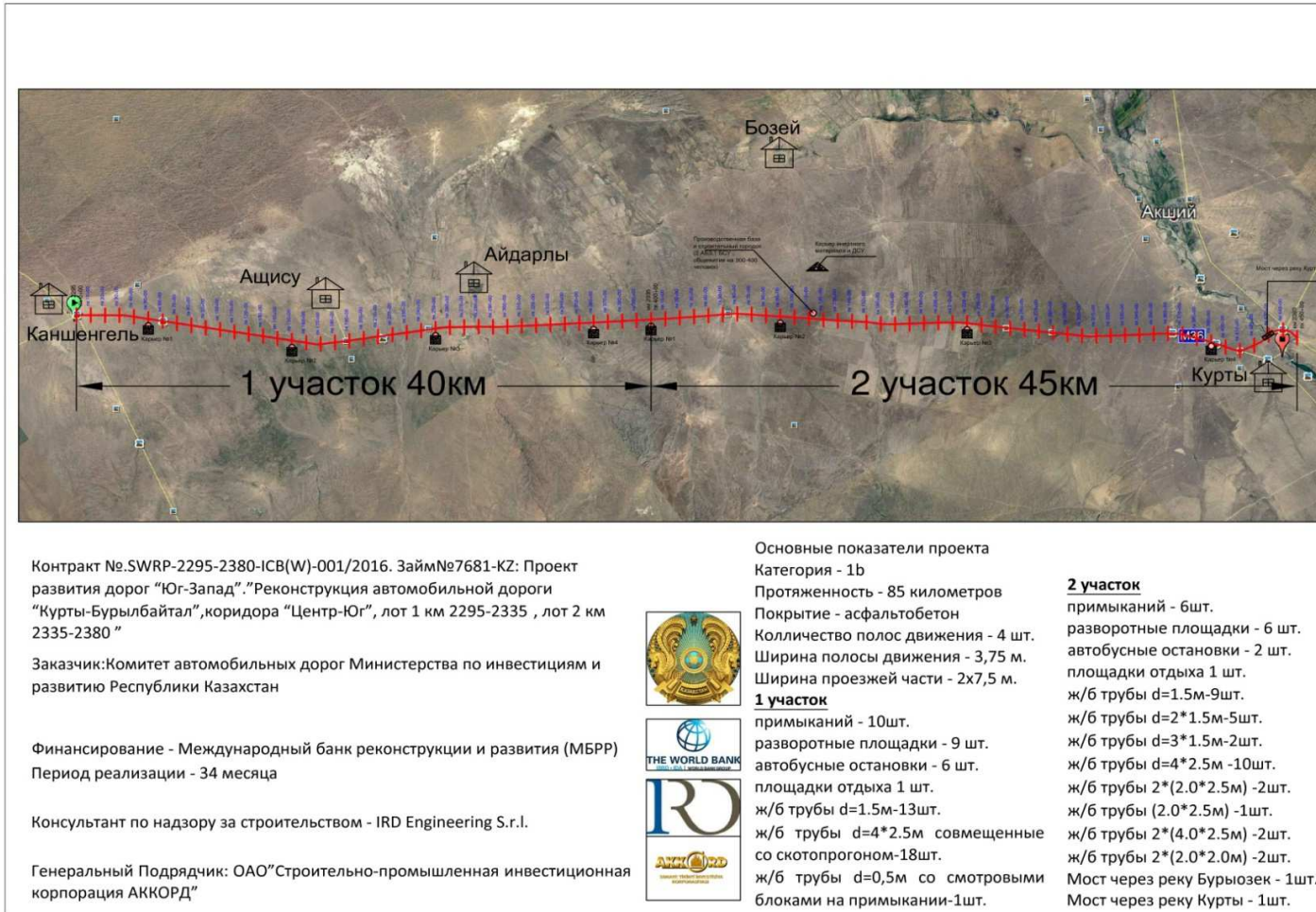
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## Appendix– 7

The South-West road development project.  
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Schematic drawing of the section km 2295-2335, km 2335-2380. Appendix 7



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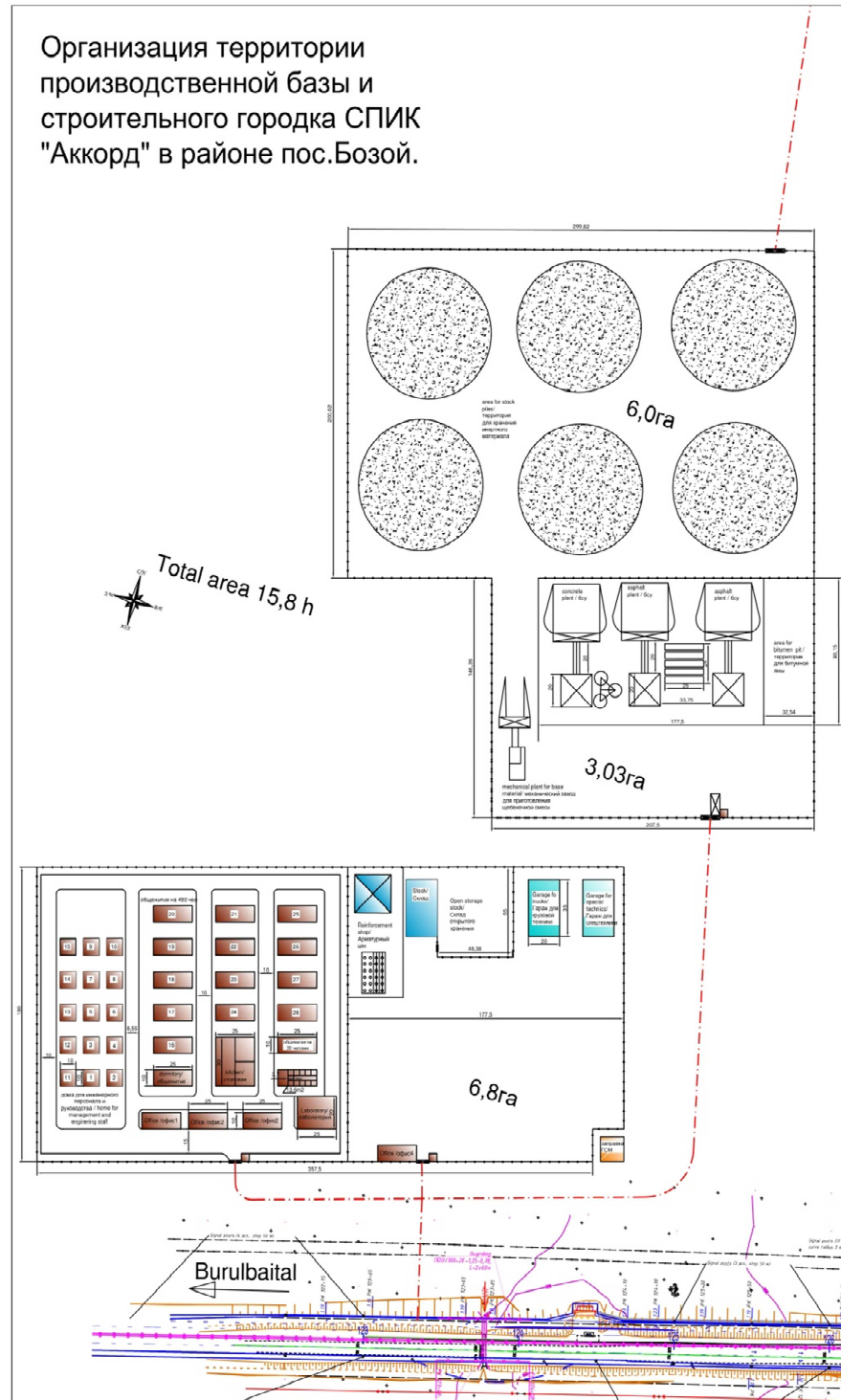
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## Appendix – 8



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Scheme of shift camp, Appendix 8.



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## Appendix – 9

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## Appendix 9: Summary Plan for Monitoring and Reducing Environmental Impacts

№ п/п	Name of event	Method of conducting	Frequency of execution
1	2	3	4
<b>Air Quality Monitoring</b>			
1.1.	Instrumental measurement of basic indicators of the state of the environment	At locations of pollution sources	Start of construction
1.2.	Current instrumental measurements of air pollution	At locations of pollution sources	At least once a month, or more often at the request of an engineer
<b>Dust suppression</b>			
1.3.	Spraying of water in the process of road construction works	Road construction site	In dry and windy weather every 2 hours during the whole working time
1.4.	Humidification of stored materials, canvas cover	Places for storage of loose materials	Constantly
1.5.	During transport, bulk materials can not be loaded above the side and rear sides	Transport	Constantly
1.6.	When transporting loose materials must be closed with a clean tarpaulin	Transport	Constantly
1.7.	When the work of transport and technology is stopped, the engines must be switched off	Road construction site	Constantly
1.8.	Vehicles running on diesel fuel should be equipped with exhaust gas neutralizers	Transport	Constantly
<b>Monitoring of water quality</b>			
2.1.	Conduct a qualitative water analysis (baseline)	In places of the river mouth, where road construction works will be carried out	Before starting work

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1	2	3	4
2.2.	Monitor water quality	In places of the river mouth, where road construction works will be carried out	At least once a month, or more often at the request of an engineer
2.3.	All water and other liquid waste originating in the plots should be collected and transported to a specific location or from sites in a non polluting way	In the locations of water bodies	Constantly
2.4.	It is forbidden to dump and dump any materials and substances obtained during work in water sources and low relief areas	In the locations of water bodies, as well as in places of low relief	Constantly
2.5.	It is necessary that all permanent and temporary watercourses and catchments at the construction site and beyond are kept clean, free from debris and waste	In the locations of water bodies, as well as in places of low relief	Constantly
2.6.	In the production of excavation work to allow soil dumping beyond the boundaries of the temporary withdrawal indicated on the construction plan	In the locations of water bodies	Constantly
2.7.	Do not allow uncontrolled storage of seized soil in the water area of the river	In the locations of water bodies	Constantly
2.8.	Do not allow solid, insoluble objects, industrial, domestic and other origin wastes to enter the water body	In the locations of water bodies	Constantly
2.9.	Do not allow the basing of earth-moving machinery and vehicles on the water protection zone and the strip	In the locations of water bodies	Constantly
2.10.	Equip places of temporary residence of workers with a reservoir for collection of generated domestic wastewater and a container for collection and storage of solid waste	In the locations of water bodies	Constantly

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1	2	3	4
2.11	It is necessary to instruct the workforce on compliance with environmental requirements and environmental measures	In places of road construction works	Before starting work
<b>Monitoring of noise and vibration</b>			
3.1.	Instrumental measurement of basic noise and vibration	In nearby settlements on the border of the SPZ	At the beginning of construction
3.2.	Current instrumental monitoring of noise and vibration	In nearby settlements on the border of the SPZ	At least once a month, or more often at the request of an engineer
<b>Storage of fuel and chemicals</b>			
4.1.	Storage of fuel and lubricants provided at specialized service stations under a contract. Refueling of road-building equipment is carried out by a filling machine. Based on this, there will be no pollution of the environment.		
<b>Protection of cultural, historical and archeological monuments</b>			
5.1.	To ensure the integrity and safety of historical and cultural heritage sites, guard zones within a radius of 200 m from the axis of the projected road	In the locations of objects of historical and cultural heritage	Constantly
5.2.	In case of detection of geological, geomorphological, hydrogeological objects having a special scientific, ecological cultural and other value, it is necessary to stop the works and notify the authorized body	In workplaces	In case of occurrence of the specified case
<b>Relations with the population</b>			
6.1.	Informing the public about the project through the media (ad in the newspaper), the Internet	Settlements	Before construction starts
6.2.	Notify people about road construction works near settlements	Settlements	Before starting work
6.3.	Distribution of booklets or leaflets with information about the project	Settlements	In continuation of all road construction works

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1	2	3	4
<b>Земляные работы</b>			
7.1.	Removal of the fertile soil layer before the start of work with subsequent removal to the storage areas of the PPS	Road construction site	Before construction begins
7.2.	Restoration of natural landscape and vegetation upon completion of all works	Throughout all road construction works	Upon completion of the project
7.3.	Restoration of the land on which roadside service buildings were installed	Throughout all road construction works	Upon completion of the project
7.4.	Removal of all garbage and used material outside the construction site to the waste storage site	Throughout all road construction works	Constantly

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## Appendix – 10

## **Appendix - 10: Additional information**

### **1. Climatic characteristics of the area**

#### **Section km 2295-2335 , Section km2335-2380.**

The main direction of the road is south-east.

The climate of the region is sharply continental and arid, DKZ-V; The hottest month is July; The average temperature is + 25.4 ° C; Absolute maximum air temperature: + 47 ° C; The coldest month is January; The average temperature is 11.7 °C; Absolute minimum of air temperature: -46 °C; The thickness of the snow cover with an estimated probability of exceeding 5% - 35 cm. Wind region-III.

Medium-upper-Quaternary sediments take part in the geological structure. The thickness of Quaternary sediments almost everywhere exceeds 200-300 m. Middle-Upper-Quaternary deposits are represented by sands of different species, gravel soils, sandy loam, loams, clays. Modern formations are represented by the soil-vegetation layer.

Underground waters covered by excavations to a depth of 3.0-7.0 m were not opened. The only exception is the section at km 2325 + 780 (dry land), where ground waters are opened at a depth of 1.0 m and confined to the zone of gravel sand.

The supply of groundwater is due to the infiltration of spring snowmelt and rainwater.

There are no dangerous physical and geological phenomena.

The area is not seismic according to SNIP 2.03-30-2006.

### **2. Geological structure of the site**

#### **Section km2295-2335.**

The road is laid in the Ili-Balkhash-Alakul desert basin. Directly the route passes along the semi-desert foothill semi-desert sloping plain (Jusundala) with a general bias towards the Ili River, which was crossed by the bunkans.

Pristratsovaya strip is composed of the following varieties of soils: IGE-0 soil-fertile layer (to be removed) (9c).

IGE-1 sandy loam with a solid consistency, with gravel up to 10% (36b). IGE-2 sandy loam with a solid consistency, with gravel up to 20% (36c).

IGE-3 sandy loam silty solid consistency, with gravel from 10 to 20% (36b, 36b).

IGE-4 is a silty dusty sand, with gravel up to 10% (29b).

IGE-5 is a silty dusty sand, with gravel up to 20% (29c).

IGE-6 loam is heavy, sandy, solid, with gravel up to 10% (35c). IGE-7 loam is heavy sandy hard, with gravel up to 20% (35g). IGE-8 loam is light sandy solid, with gravel up to 10% (35c).



IGE-9 loam is heavy silty, hard, with gravel up to 10% (35B).

IGE-10 clay light sandy solid, (8d).

IGE-11 sand gravelly weak-willed, average density, with lenses of sandy loam, loam, with lenses of cemented sand (29B).

IGE-12 sand large coarse, medium density, with gravel up to 20% (29c). IGE-13 sandy small mossy, with gravel to 15% (29c).

IGE-14 gravel is weakly moist, with sandy loamy loam, loam (6a).

IGE-15 conglomerate on lime cement, weathered, low-strength (18a). IGE-16 medium-sized sand is weakly moist, with gravel up to 10% (29a).

The moisture content of the soils of the pritrace belt is 3.1 - 7.5%, and the optimum humidity is 8.0 -

13,0%, which is 5-6% lower than required, it follows that it is necessary to erect a zapolotno in the late autumn, winter and early spring periods.

The coefficient of filtration of sands in the compacted state is 0.0036-0.151 m / day. Salinization of soils - from non-saline to sulphate mean

The degree of aggressive effect of soils on concrete on ordinary Portland cement from non-aggressive to strongly aggressive and from non-aggressive to slightly aggressive to concrete on sulfate-resistant cement. The chloride content in terms of Cl from non-aggressive to medium aggressive.

Groundwater passed by excavations with a depth of 3-7.0 m has not been opened, the exception is the section at km 2325 + 780 (dry dol), where ground waters are opened at a depth of 1.0 m. The established level of groundwater is 1.0 m. The amplitude of groundwater fluctuations is  $\pm$  1.0 m.

The degree of aggressive impact of groundwater on the concrete of the brand on water permeability W4 is slightly aggressive, according to the chloride content in recalculation to chlorine with occasional wetting weakly aggressive. It is non-aggressive to sulfate-resistant cement.

Type of terrain by nature and degree of humidification -1  
On the section km2325 + 750 (pc306 + 00) the pipe 2x2m 2hochkovaya, the apron is diluted to a depth of 1.5-2.0 m, with the release of groundwater, a foundation pit 10x20 m was formed, with the expansion of the excavation, it can serve as a source of technical water supply. Corrosive aggressiveness of soils in relation to carbon steel - medium-high. The degree of corrosion aggressiveness of soils with respect to the aluminum sheath of the cable from low to high, to the lead sheath of the cable is from low to high (according to laboratory data LLP "Ecohydrochemical" and "KazHydro". Within the offshore strip, taking into account the nomenclatural types of soils, their consistency, salinity, 16 engineering-geological elements were identified, the characteristics of the building properties of soils are shown in the corresponding sheet and are reflected in the soil part of the longitudinal profile.

Section is km2335-2380.

The soil cover in the design area is poorly developed, with serozemes slightly emollient up to 20 cm. Vegetation is mainly desert-steppe. Shrub vegetation is present along the banks of the river and in artificial plantations.

Geological features of the construction area

The alluvial formations of the Middle-Upper Quaternary age (aQII-III) take part in the geological structure of the site; they are represented by sandy loam and loam, below the sands of different sizes and gravel soils. The underlying rocks are the formation of the weathering crust

by the Mesozoic rocks (Mz). They are represented by loams and sandstones of greenish-gray color, strongly weathered, highly fractured, very low strength. When drilling, under mechanical influence, they are easily destroyed to the state of crushed rock with sandy loamy and loamy aggregate. The thickness of the weathering zone, to the explored depth, is not determined. Existing roadbed and off-road strip The existing road, which is currently being carried out traffic flow, is in a satisfactory condition, in some places in poor condition, the road parameters do not meet regulatory requirements under the existing and projected traffic intensity, inconsistency of the type of existing junctions of the road category. The excavation of the roadbed was made from off-site reserves, with the exception of sections of the culvert assembly and approaches to bridge crossings. Based on the results of the off-site processing of the field documentation of boreholes and the results of laboratory tests of samples taken from the existing earth pit, according to the road-building classification of soils, three engineering-geological elements were identified:

IGE 1 - sandy loam; IGE 1-1 - silty sandy loam;

IGE 2 - light loamy loam.

Bulk primers: sand dark-brown silty little degree of water saturation, dense, in the roof with inclusions of gravel to 25%, capacity 0,3 ... 1,8 m.

The clayey soils composing the working layer for the expected depth of propagation of the core are potentially shear, suitable for use in the working layer provided that the requirements of 7.2.4 are met. SNiP RK 3.03-09-2006 - ensuring the diversion of surface water in the autumn period and in the case when the working layer is removed from the groundwater table to a depth exceeding the height of the capillary rise of moisture.

Soils are not salinized everywhere, the degree of salinity is weak. Type of salinity, predominantly sulfate. The boundaries of the plots are given in the lists of the building properties of soils.

In the ground below the bottom of the existing embankment and in the near-highway strip, eight engineering-geological elements have been identified, the distribution of which in plan and depth is not shown in the soil section of the longitudinal profile and in the "Sheets of soil properties below the bottom of the embankment and subsoil land."

Soils below the embankment of the earth and the soil of the offshore strip to the depth intended for use are presented:

IGE 3 - sandy loam

ИГЭ 4 - loam lightweight sandy IGE 5 - sand of medium size IGE 7 - sand gravel

IGE 8 - gravel ground IGE 9 - loam

IGE 10 - gritty crushed earth IGE 11 – sandstone

Quaternary soils of the near-strips have sulfate mean salinity. The eluvial soils are in a bedrock, their density is high enough and meets the requirements of SNiP RK 3.03-09-2006 "Roads" to the soil of the working layer. By nature and degree of moistening the site is assigned to the first type of terrain. In the prirassovoy strip everywhere there is a vegetative layer of soil to be removed. The thickness of the vegetation layer varies from 0.10 m to 0.20 m. The average thickness of the vegetative layer of the soil is 0.15 m. The working project provides for a phased reconstruction of the road: Stage 1 - construction of a new highway in the opposite direction, for 2 lanes, construction of

artificial structures, junctions and intersections in one level;  
Stage 2 - reconstruction of the existing highway, with broadening and increasing the height of the embankment in certain areas, with the pouring of slopes, careful profiling and compaction.

#### 5. Soils and soil-forming rocks

The surveyed site is located in a steppe-desert zone, with a characteristic soil-plant association.

On the site, the most widespread are the serozem soils. Their power ranges from 0.2 to 0.35 m.

Natural vegetation is developed in the floodplains of rivers and streams, and in plains and is represented by sparse forests and shrubs.

Gray-sage deserts with the participation of keireuk and boyalych, herbaceous vegetation is meager.

Along the existing road there are protective forest belts, mainly karagachi and poplar, less often bushes, jida, willow and fruit trees.

One of the most pressing environmental problems in the area of road construction is soil erosion. Along the road, you can easily see the land, spoiled by erosion and weathering in the form of gullies, ravines and "bald head", i.e. surfaces of deprived soil. This threatens not only the physical and biological environment, but also people, as the arable and pasture lands on which food is grown and cattle graze are destroyed. In such places, it is necessary to strengthen the gullies and ravines, restore the vegetation layer with sowing of the grass, reclaim the damaged surfaces, and produce landscaping by planting trees and shrubs.

### Surface and ground water

Surface and groundwater territory of the road is poor. In hydrogeological terms, the reconstruction site refers to a zone with a deep groundwater table. This site refers to the first type of terrain - with a guaranteed surface runoff.

#### 1. Plant and animal life

##### *Section km 2295-2335.*

The vegetation of the territory under consideration is characteristic of the arid steppe-desert zone and is represented by gray-woolly deserts with the participation of keireuk and boyalych, grassy vegetation is meager. Natural vegetation is developed in

floodplains of rivers and streams and on plains and is represented by floodplain forests, bushes;

Woody vegetation is represented by forest belts along the existing motorway, mostly by carobachs and poplars, less often bushes, jida, willow and fruit trees.

The fauna is characteristic of the steppe desert zone. From mammals the most common are rodents - ground squirrels, hamsters, hares, jerboas. Of predators live the fox, the hawk. Many turtles, snakes, lizards and arachnids. Of birds in the steppes nest eagles, moons, kestrel, passerines, wild partridges; near the rivers and lakes there are many different waterfowl.

Because of the low population density and the reduction of arable land, the living conditions of animals and birds are natural.

Specially protected natural areas.

The territory of the reconstruction of the highway passes through the territory of the Zhusandalinsky protected area.

Organized by: Resolution of the Government of the Republic of Kazakhstan of March 15, 2001 No. 382 "On the Organization of State Protected Areas of Republican Significance".

Location: Almaty region - Balkhash, Ili and Zhambyl districts; Zhambyl region - Kordaysky, Moyynkumsky, Shuya districts.

Area: 2 757 500 hectares.

Preset modes: Preserved mode (80 660 ha), customized mode (353 236 ha), adjustable mode (2 323 604 ha).

Biodiversity: Vegetation - 19 species, of which endangered species - 4, rare species - 14, widespread - 1. Animal life - 223 species, of which mammals - 44, birds - 179 (migratory, nesting, sedentary, wintering).

#### ***Section km 2335-2380.***

The vegetative world of the region is determined by high-altitude zones. In the Dzungarian Alatau in the lower belt of mountains up to an altitude of 600 m there is vegetation of desert type: wormwood, saltwort, and ize. Above expressed steppe belt: feather grass, timothy, hips, honeysuckle along the river valleys - apple-aspen forests with an admixture of bird cherry, hawthorn. Up to a height of 2200 m a forest - meadow belt rises. Forests consist of Tien Shan fir, Siberian fir. Then comes the alpine belt: cabresia, Altai violet, saxifrage, alpine poppy. The projected site is under the influence of multicomponent anthropogenic impact, on the technogenic developed territory of the site. Growth of endemic species (natural tree forms of vegetation characteristic of the region) is not observed on the territory. There are no rare disappearing Red Book plants in the zone of influence. There are no natural food and medicinal plants. According to cadastre of registration documentation, there are no agricultural lands in the area under consideration.

#### **Animal world**

The animal world of the region is mixed, here are found mainly Altai and Tien Shan animals. In the lower belt of the mountains - hares, ground squirrels, hamsters, badgers, etc. In

forest-meadow belt - brown bears. In the highlands - mountain goats, argali, gray ground squirrels.

Of the birds in the forests there are Siberian three-year woodpecker, nutcracker, birch owl, Tien Shan king. In the highlands there are dark-belly lancers, Central Asiatic jackdaws, cacti, pheasants.

The fauna of the projected site is represented mainly by small rodents, reptiles, birds and insects. A feature of the site is the abundance of domestic animals, as well as the well-adapted for the life and reproduction of synatropic species of animals.

In the zone of influence, the following representatives of the animal kingdom may dwell:

- a class of reptiles: a quick lizard, a round head, an ordinary one, a viper, multi-colored lizard, a shield-muzzle;
- a class of mammals from a detachment of rodents: field mouse, vole-housekeeper, common mouse, ground squirrel, jerboa, hedgehog;

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- Class of amphibians: a toad, a sharp-edged frog, etc .;
- class of insects: phalanx, mosquito, common fly, golden-eyed, dragonfly;
- Class of birds: Spanish sparrow, lark, jackdaw, gray crow, starling, wagtail, wax, golden bilberry.

The site allocation area is influenced by multi-component anthropogenic impact. The paths of seasonal migrations and resting places, birds and mammals during migrations in the territory of location were not noted. There are no rare endangered species of animals listed in the Red Book.

### **Landscape**

The site is located far from specially protected natural areas. In the immediate vicinity of the territory, specially protected areas and valuable natural complexes (zakaznik reserves, nature monuments), waterfalls, natural reservoirs of valuable tree species and other "monuments" of nature, which are of historical, aesthetic, scientific and cultural value are absent.

## **1. Characteristics of the enterprise as a source of environmental pollution**

### **Section км 2295 - 2335.**

The quality of atmospheric air, as one of the components of the natural environment, is an important aspect in assessing the impact of construction work on the environment and public health.

The justification of the data on emissions of pollutants into the atmosphere from sources of allocation during the reconstruction of the highway was made taking into account the existing methods, consumables and materials.

For the period of work on the construction of sources of air pollution will be the work of construction equipment, welding, unloading of inert materials (crushed stone and sand), excavation, waterproofing works.

For the period of operation there are no sources of pollutant emissions.

**Source # 6001** - demolition of existing buildings. With the demolition of existing buildings, dust emissions will occur during the operation of the excavator and loading demolished structures into dump trucks for removal outside the site. In the process of demolition, dust emissions from inorganic dust will occur (2908).

**Source №6002** - the work of construction equipment. When the construction equipment is in operation, fuel will be burned, during which harmful substances are released into the atmospheric air. In accordance with the resource estimates and the construction project for the construction sites, 19 types of vehicles will be involved in a total of 49 units operating on diesel fuel. During the work of construction equipment, combustion products of diesel fuel are released into the atmosphere: hydrocarbons, carbon monoxide (0337), nitrogen oxides (0301), sulfur dioxide and soot.

**Source No. 6003** - movement of construction equipment on the construction site. When the machinery moves through the site, inorganic dust is released into the atmospheric air (2908).

**Source No. 6004** - handling and loading operations. When carrying out construction work, excavation works are provided, mainly digging trenches and trenches. The excavator with

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a bucket capacity of 0.25-1.0 cubic meters is used for the work. In places where digging with excavators is not possible, earthworks are provided manually. The total volume of excavation works. In carrying out this type of work, inorganic dust is released into the atmospheric air (2908).

**Source №6005** - a site for unloading loose building materials. For the construction of construction materials are required, which are brought on special vehicles to the site. Emissions will occur as a result of unloading of imported construction materials, 170 tons, sand, 470930 tons of gravel and 5,380 tons of crushed stone will be used for the entire construction period. In the process of unloading, inorganic dust will be released into the atmosphere (2908).

**Source №6006** - welding post. It is planned to place two welding posts on the site. Welding operations will be carried out at welding stations. At the same time, there may be both posts in the work. The welding station will work for two hours a day, using the electrodes of the brand MR-4 (E42) in the amount of 102 kg for the entire construction period. In the process of welding, manganese dioxide (0143), iron oxide (0123) and hydrogen fluoride (0342) will be released into the atmosphere.

**Source №6007** - application of waterproofing. For waterproofing, frost-resistant bitumen-oil MB-50 mastic is used - consumption is 1244 tons. Emissions will occur as a result of waterproofing, alkanes will be released.

**Source No. 6008** is the evaporation of bitumen during the impregnation of the web. Evaporation of the ultimate hydrocarbons (2754), reduced to naphtha, is calculated on the basis of the production program of work. In accordance with the design solutions, Bitumen BND 60/90 is used as the binder. The temperature of the impregnation mixture is 160 ° C. The coating speed is 2 km / h with a pass width of 2.0 m, which corresponds to 4000.0 m<sup>2</sup> / h.

**Source No. 6009** - evaporation of bitumen when laying asphalt concrete. The asphalt-concrete coating is represented by one layer - a fine-grained, dense asphalt-concrete mixture, 4.0 cm thick. For this type of work, marginal hydrocarbons (2754)

**Source No. 6010** - during the construction period there are sites for storage, soil, sand and gravel, gravel for calculation, their number is taken from the estimates and materials of the working draft. During storage of the above bulk materials, inorganic dust will be released into the atmosphere (2908).

Thus, for the construction period, 10 sources of atmospheric air pollution will be located on the construction site of the substation reconstruction, emissions will be unorganized. Emissions from construction machinery and vehicles are not standardized. The payment for these emissions is taken after the fact (on fuel consumption).

There are no emergency and salvo emissions at the enterprise.

#### **Section км 2335-2380.**

The main sources of emissions of harmful substances into the atmosphere are:

Industrial site №1 Ily district.  
Source-6001 - Overburden of rock (removal and displacement of soil and vegetation layer by

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bulldozer). The soil-vegetative layer of the earth is moved by a bulldozer into dumps. When moving the soil with a bulldozer, inorganic dust of sodio SiO<sub>2</sub> from 20-70% is released into the dumps. The source is unorganized.

Source-6002 - Emissions of dust during road transport operations. When vehicles move in the territory of the PGR areas, inorganic dust of sodio-SiO<sub>2</sub> from 20-70% is released into the atmospheric air. The source is unorganized.

Source-6003 - Excavation of soil. Excavation of soil during construction is carried out by an open method - an excavator. When the post of excavation works is in the air, inorganic dust is released, si.SiO<sub>2</sub> from 20-70%. The source is unorganized.

Source-6004 - The post of the excavation of soil, for erection of a mound. During unloading and operation of the dump truck in the atmospheric air, inorganic dust, si.SiO<sub>2</sub> from 20-70% is released. The source is unorganized.

Source-6005 - Leveling the soil with a bulldozer. When the soil is leveled with a bulldozer, inorganic dust is released into the atmospheric air, with SiO<sub>2</sub> from 20-70%. The source is unorganized.

Source-6006 - Post of the load, storage of ASG. When unloading, storing the ASG with dump trucks, inorganic dust is released into the atmospheric air, sod.SiO<sub>2</sub> from 20-70%. The source is unorganized.

Source-6007 - Post of the load, storage of the ShchGGS. When unloading, storing the crushed-sand-gravel mixture with dump trucks, inorganic dust is released into the atmospheric air, siO<sub>2</sub> from 20-70%. The source is unorganized.

Source-6008 - Aligning the ASG with an autograder. When leveling the PGS with an autograder, inorganic dust is released into the atmospheric air, with SiO<sub>2</sub> from 20-70. Unorganized source

Source-6009 - Leveling of the GPGS by an autograder. When leveling

gravel-sand-gravel mixture by an autograder, inorganic dust is released into the atmospheric air, with SiO<sub>2</sub> from 20-70%. Unorganized source

Source-6010 - Laying of asphalt-concrete mixture. When laying the asphalt-concrete mixture, hydrocarbons C<sub>12</sub>-C<sub>19</sub> are allocated to the road. The source is unorganized.

Source-6011 - Fasting post, storage of crushed stone. Concrete mixer. When unloading, storing crushed stone with dump trucks, inorganic dust is released into the atmospheric air, with SiO<sub>2</sub> from 20-70%. The source is unorganized. Source-6012 - The post of excavation, storage of sand.

Concrete mixer. When unloading, storing sand with dump trucks, inorganic dust is released into the atmospheric air, siO<sub>2</sub> from 20-70%. The source is unorganized. Source-0013 - Loading of silo with cement (silo for cement storage). On the site of the mixing plant, a silo plant is located to store cement. When silos are loaded with cement, inorganic dust is released into the atmospheric air, soda. SiO<sub>2</sub> 70 -20%. The silo plant is equipped with filters. The source is organized. The height of the pipe is 12 m, diameter 0.35 m.

Source-6014 - Concrete mixer. When transporting and depositing crushed stone, sand, cement in a mixing plant, inorganic dust is released into the atmospheric air, soda. SiO<sub>2</sub> 70 -20%. The source is unorganized. Source-6015 - Welding works. When welding metal structures in the atmospheric air are released: manganese dioxide, hydrogen fluoride, iron oxide. The source is unorganized.

Source-6016 - Painting work. When painting and drying, airborne aerosols and volatile

substances such as suspended solids, xylene, white spirit are released into the air. The source is unorganized.

Industrial site №2 Zhambyl district.

Source-6017 - Overburden of rock (removal and displacement of soil and vegetation layer by bulldozer). The soil-vegetative layer of the earth is moved by a bulldozer into dumps. When moving the soil with a bulldozer, inorganic dust of sodio SiO<sub>2</sub> from 20-70% is released into the dumps. A source unorganized.

Source-6018 - Dust emissions during road transport operations. When

The movement of vehicles in the territory of the PGR sites in the atmospheric air is the inorganic dust of soy.SiO<sub>2</sub> from 20-70%. The source is unorganized.

Source-6019 - Excavation works of soil. Excavation of soil during construction is carried out by an open method - an excavator. When the post of excavation works is in the air, inorganic dust is released, si.SiO<sub>2</sub> from 20-70%. The source is unorganized.

Source-6020 - The post of excavation of soil, for erection of a mound. During unloading and operation of the dump truck in the atmospheric air, inorganic dust, si.SiO<sub>2</sub> from 20-70% is released. The source is unorganized.

Source-6021 - Leveling the soil with a bulldozer. When the soil is leveled with a bulldozer, inorganic dust is released into the atmospheric air, with SiO<sub>2</sub> from 20-70%. The source is unorganized.

Source-6022 - Post loading, storage ASG. When unloading, storing the ASG with dump trucks, inorganic dust is released into the atmospheric air, sod.SiO<sub>2</sub> from 20-70%. The source is unorganized.

Source-6023 - Post of the load, storage of the GPGS. When unloading, storing the crushed-sand-gravel mixture with dump trucks, inorganic dust is released into the atmospheric air, siO<sub>2</sub> from 20-70%. The source is unorganized.

Source-6024 - Aligning the ASG with an autograder. When leveling the PGS with an autograder, inorganic dust is released into the atmospheric air, with SiO<sub>2</sub> from 20-70. Unorganized source

Source-6025 - Leveling of the GPGS by an autograder. When the gravel-sand-gravel mixture is leveled with an autograder, inorganic dust is released into the atmospheric air, soda-SiO<sub>2</sub> from 20-70%. Unorganized source

Source-6026 - Laying of the asphalt-concrete mixture. When laying the asphalt-concrete mixture, hydrocarbons C12-C19 are allocated to the road. The source is unorganized.

Source-6027 - The post of the excavation, storage of crushed stone. Concrete mixer. When unloading, storing crushed stone with dump trucks, inorganic dust is released into the atmospheric air, with SiO<sub>2</sub> from 20-70%. The source is unorganized.

Source-6028 - The post of the excavation, storage of sand. Concrete mixer. When

unloading, storage of sand by dump trucks, inorganic dust, sod.SiO<sub>2</sub> from 20-70% is released into the atmospheric air. The source is unorganized. Source-0029 - Loading of silo with cement (silo for cement storage). On the site of the mixing plant, a silo plant is located to store cement. When silos are loaded with cement, inorganic dust is released into the atmospheric air, soda.



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SiO<sub>2</sub> 70 -20%. The silo plant is equipped with filters. The source is organized. The height of the pipe is 12 m, diameter 0.35 m.

Source-6030 - Concrete mixer. When transporting and depositing crushed stone, sand, cement in a mixing plant, inorganic dust is released into the atmospheric air, soda. SiO<sub>2</sub> 70 -20%. The source is unorganized. Source-6031 - Electric welding work. When welding metal structures in the atmospheric air are released: manganese dioxide, hydrogen fluoride, iron oxide. The source is unorganized.

Source-6032 - Painting work. When painting and drying, airborne aerosols and volatile substances such as suspended solids, xylene, white spirit are released into the air. The source is unorganized.

With the help of the program of the era, an inventory of emissions of harmful substances into the atmosphere for the construction period was calculated and is presented in tabular form: Table 4.2.

**The gross emission of harmful substances in two industrial sites is:**

Name of substance	g / sec	t / year
<b>Industrial site 1 - Ili district</b>		
Oxides of iron	0.0028	0.0045
Manganese Dioxide	0.00031	0.0005
Hydrogen fluoride	0.0001	0.0002
Demethylbenzene	0.0125	0.0922
White Spirit	0.0125	0.0922
Hydrocarbons are extreme C12-19	0.12	0.93312
Suspended substances	0.023	0.0676
Dust inorganic: 70-20% of silicon dioxide	1.44636	44.96289
<b>TOTAL for site 1</b>	<b>1.61757</b>	<b>46.15321</b>
<b>Industrial site 2 - Zhambyl district</b>		
Oxides of iron	0.0028	0.0045
Manganese Dioxide	0.00031	0.0005
Hydrogen fluoride	0.0001	0.0002
Demethylbenzene	0.0125	0.0665
White Spirit	0.0125	0.0665
Hydrocarbons are extreme C12-19	0.12	0.93312
Suspended substances	0.023	0.0488
Dust inorganic: 70-20% of silicon dioxide	1.44636	65.30359
<b>TOTAL on site 2</b>	<b>1.61757</b>	<b>66.42371</b>

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<b>Total emissions in two industrial sites</b>		
Oxides of iron	0.0056	0.009
Manganese Dioxide	0.00062	0.001
Hydrogen fluoride	0.0002	0.0004
Demethylbenzene	0.025	0.1587
White Spirit	0.025	0.1587
Hydrocarbons are extreme C12-19	0.24	1.86624
Suspended substances	0.046	0.1164
Dust inorganic: 70-20% of silicon dioxide	2.89272	110.26648
<b>TOTAL</b>	<b>3.23514</b>	<b>112.57692</b>

## 1. Work camp.

Room for engineers, head office, second office, laboratory, cottage house for engineers.  
 Diesel generator. Emissions from this source are not standardized, since the diesel generator is used as an emergency source of electricity.

On the territory of the shift camp there is a parking lot, which is also a source of pollutant emissions into the atmosphere. When entering and leaving the parking area, nitrogen oxide, nitrogen dioxide, kerosene, sulfur dioxide, carbon oxide are released into the atmosphere. The layout of the shift camp in Appendix 8.

### 1. Characteristics of the enterprise as a source of industrial and domestic waste

During the operation of the facility, the following types of waste are formed:

- } solid waste;
- } used fluorescent lamps;
- } estimates from the territory;
- } Used oil;
- } used batteries;
- } used tires.

Solid waste - are formed in the non-productive sphere of activity of the personnel of the enterprise, as well as when cleaning the premises of the workshops and the territory of the enterprise. SHW will be exported on a contractual basis with local utilities after commissioning.

Exhausted fluorescent lamps - are formed due to depletion of the life time resource. The composition of lamps type LB (%): glass - 92, legs - 4,1; socle mastic - 1,3; getinaks - 0,3; phosphor - 0.3; Metals - 2.0 (including Al-84.6%, Cu-8.7%, Ni-3.4%, Pt-0.3%, W-0.6%, Hg-2.4%) .

Estimates from the territory. Formed

when cleaning the territory, temporarily placed in a metal container, as they are accumulated, they are exported together with solid domestic waste to a landfill site after the contract is signed. Waste of the V hazard class.

Used oils - are formed during the current repair and inspection of motor vehicles on the territory of the enterprise. For temporary placement of oils, special containers are provided with closing lids in the premises of shops, oil facilities or in the territory of the fuel and transport shop. It is stored inside the MTM premises. Used for the company's own needs. Waste oils belong to the amber waste list AC030.

Used car tires - are formed after the expiry of the period. Not fire dangerous, resistant to water, air and precipitation. Old pneumatic tires are temporarily stored on the territory of MTM. Used in the enterprise for landscaping as flower beds. Spent car tires refer to the green list of waste GK020.

Used batteries with electrolyte - formed after the expiry date. As accumulation is paid to contractors in exchange for new ones. Collection and accumulation is carried out in temporary closed metal containers. They are stored inside the MTM premises. Waste batteries belong to the amber waste list AA170.

### **1. Environmental Protection Plan**

The WB Safeguard Policies Regulation states that the EMP contains a list of mitigation actions and a set of measures to be taken during the project to avoid, reduce, mitigate or compensate for the adverse environmental impact .

Taking into account the specifics of the operation of the facilities of JSC SPIK Accord, the control on sources is recommended to be carried out by the following methods:

- for organized emission sources, instrumental, or instrumental-laboratory with direct instrumental measurements;
- for unorganized sources - calculation method.

The schedule for controlling emissions and discharges at each source is given in the tables in Annexes 3, 4, 5. PPEM is given in Annex 1. Monitoring of the state of atmospheric air will be carried out directly on the sources of emissions.

The priority of the controlled ingredients is determined taking into account the hazard class of the substances, the criteria that reflect the toxic properties of the pollutants, the quantitative characteristics of the emissions, the ability to accumulate and transform them into more dangerous chemical forms, the magnitude of the health effects of the population and biota objects, the ability to organize measurements, and other factors. At the enterprise under review, control will be carried out on emission sources that contribute the most to air pollution.

Based on the results of the survey, the actual state of atmospheric air is analyzed. The values of pollutants obtained during the calculations are compared with the control values of the maximum one-time concentrations established in the inventory of emissions of harmful substances into the atmospheric air, as well as with maximally single maximum permissible concentrations (MPC m.) For populated areas. If an excess of ambient air quality standards is detected for any polluting substance, the cause of the excess is established.

Reporting information on the results of laboratory-instrumental control over the state of atmospheric air should be provided in accordance with the order of the Minister of Environmental Protection No. 228-ø of August 25, 2010 (addition to order No. 123-p of April 24, 2007).

The results of the survey of the atmospheric air state are made in the form of a report describing

the meteorological and production conditions under which the survey was carried out, the actual measurements with the timing of the selection, an analysis of the atmospheric air at the reference point, and in the case of exceeding the ambient air quality standards, causes of excess. Reporting on the results of the PEC should reflect full information on the execution of the program for the reporting period, as well as the results of internal audits. The report provides for an explanatory note on the execution of work, compiled by the nature user in an arbitrary form.

#### *a. Methodology*

The PEEP shall be prepared for all identified environmental impacts to be prepared before the start of construction, operation and monitoring works.

The methodology consists of the following steps:

- identification of measures to reduce and protect the environment for each of the project activities and the environmental component;
- ways to reduce them, compensate and improve the measures for each of the identified consequences and risks;
- development of a monitoring mechanism for the proposed mitigation measures;
- Assessment of budgetary needs for mitigating the consequences of project implementation and monitoring measures;
- Define the responsibilities of the various institutions participating in the project for the implementation and monitoring of mitigation measures.

The EMP has been prepared in accordance with the above criteria.

#### *b. Monitoring*

mechanism

Monitoring of environmental components and mitigation measures during construction and operation is a key component of the environmental monitoring plan (EPM) to ensure environmental protection.

The purpose of monitoring is:

- monitor changes in the environment at various stages of the project cycle, comparing with the baseline conditions;
- management of environmental issues arising from construction and installation work through the quality and reliable monitoring of compliance with environmental standards.

The monitoring mechanism is designed for each specific impact and includes:

- Place of monitoring (places near the project activity, sensitive receptors or in the project impact zone);
- Means of monitoring, i.e. monitoring parameters and methods of control (visual inspection, consultations, interviews, surveys, field measurements or sampling and analysis);
- Frequency of monitoring (weekly, monthly, seasonally, annually or in the course of performing certain activities).

c. The monitoring program will also include regular monitoring of construction works to ensure that they comply with environmental requirements, in accordance with relevant standards, specifications and an environmental monitoring plan. The purpose of such monitoring is to assess the effectiveness of mitigation measures taken and immediately formulate additional

measures to mitigate the consequences and / or modify existing ones aimed at meeting environmental requirements as necessary during construction. The main direction of PPEM is to provide reliable information about the impact of the enterprise's activities on the environment, possible changes in exposure and adverse or dangerous situations.

The objectives of the EMP are:

- obtaining information for decision-making regarding the environmental policy of the nature user, environmental quality targets and tools for regulating production processes potentially having an impact on the environment;
- ensuring compliance with the requirements of environmental legislation of the Republic of Kazakhstan;
- Minimizing the impact of the nature user's production processes on the environment and human health;
- Increasing the efficiency of the use of natural and energy resources;
- prompt proactive response to abnormal situations;
- formation of a higher level of environmental awareness and responsibility of managers and employees of nature users;
- informing the public about the environmental performance of enterprises and risks to public health;
- increasing the level of compliance with environmental requirements;
- Increasing the production and environmental efficiency of the environmental management system;
- taking environmental risks into account when investing and lending.

The PPEM establishes a mandatory list of parameters that are monitored in the process of industrial environmental monitoring, the criteria for determining its periodicity, the duration and frequency of measurements, instrumental or calculation methods used.

Environmental assessment of the efficiency of the production process within the framework of industrial environmental monitoring is carried out on the basis of measurements and (or) on the basis of calculations of the level of emissions into the environment, harmful production factors, as well as actual consumption of natural, energy and other resources. The main element of industrial environmental monitoring, carried out to obtain objective data at a set frequency, is the Production Environmental Monitoring Program (PPEM). PPEM is conducted in accordance with the Environmental Code of the Republic of Kazakhstan dated January 9, 2007 No. 212-III [1].

The monitoring procedure is carried out taking into account the following requirements:

- obtaining qualitative and quantitative indicators of the state of the components of the OS;
- identification of all changes in the components of the environment, due to the influence of emissions and discharges of pollutants;
- Presentation of the results of the research, to the extent that it provides all the initial data for obtaining a permit for special nature use.

PPEM for JSC "SPIK Accord" is presented in Appendix 1.

### **from. Protection of cultural, historical and archeological monuments**

According to Article 52-1 "Specifics of protection and use of subsoil plots representing the special ecological, scientific, cultural or other value of the Law of the Republic of Kazakhstan from 27.01.1996 № 2828" On Subsoil and Subsoil Use "In case of geological, geomorphological and hydrogeological objects having ecological, scientific, cultural or other value, subsoil users are obliged to stop work on the relevant site and notify the authorized body for the study and use of mineral resources and the authorized body in the field of environment.

According to Article 39. Ensuring the preservation of objects of historical and cultural heritage in the development of the territories of the Law of the Republic of Kazakhstan of July 2, 1992 N 1488-XH "On the Protection and Use of Historical and Cultural Heritage"

In all types of development of territories for the period of allotment of land plots, research works should be carried out to identify objects of historical and cultural heritage at the expense of land users. It is forbidden to carry out all kinds of works that could threaten the existence of monuments.

Enterprises, organizations, institutions, public associations and citizens in the event that archaeological and other objects having historical, scientific, artistic and other cultural value are found in the course of conducting similar works are obliged to inform the state body on protection and

use of historical and cultural heritage and suspend further maintenance work. etc. Storage of fuel and chemical materials Storage of materials actively interacting with water (cement, lime, salts, etc.) is carried out only in special storage areas under the roof, or in hermetic containers. Storage of all types of fuel and lubricants is carried out in specially closed storage or hermetically sealed containers, which have a fence, concrete base and fire equipment. The storage location is far from water sources and low places. Refueling of road-building equipment is made by tankers. Refueling of dump trucks is carried out at a gasoline station under a contract. Road-building machinery is refueled in specially established places - at a gas station (gas station), as well as specialized transport - gasoline tankers. Refueling vehicles are made in accordance with safety requirements and environmental requirements. When fuel is spilled during the refueling of motor vehicles, the contaminated soil is removed. To eliminate possible spills there is a box with sand and a shovel. The place of the spill of fuel and lubricant material is abundantly covered with available sand. Sand is collected by means of a shovel in a sealed container designed for this purpose (for further neutralization this sand will be transferred to specialized organizations that have a license for collecting, using, neutralizing, transporting, placing hazardous waste and specializing in neutralizing soiled soils). For fire safety, every vehicle is equipped with fire extinguishers. Based on the foregoing, the EMP does not include requirements and activities related to the storage of fuel and chemical materials.

#### **e. Measures to inform the public about the progress of construction work**

Before the beginning of road-building works the population was informed through mass media, meetings with the population in local akimats were held. On the road construction works carried out, the population is also notified with the help of the mass media: announcements are made on television; public hearings are held with the local population; ads are in the newspapers.

#### **f. Actions and monitoring of the environment in the case of emergency situations**

Working conditions and technological processes used by JSC "SPIK Accord" do not allow the possibility of volley emissions. Nevertheless, we can not exclude the possibility of their occurrence. In case of occurrence of an uncontrolled situation, the enterprise should take all possible measures for its prompt cessation, localization and elimination of consequences. In such cases, a Plan for Eliminating Possible Emergencies should be provided, which defines the organization and production of emergency recovery work, the duties of officials involved in the liquidation of accidents.

After the end of the emergency recovery work, the nature users make an industrial impact monitoring, the program of which is coordinated with the authorized body in the field of environmental protection, by the state body of the sanitary and epidemiological service and approved by the nature user.

It should consist of a comprehensive survey of the affected area to determine the actual violations and the most effective measures to clean and restore the area. For this purpose, during the liquidation of the accident, observations are made four times a day.

The location of the points and the sampling system will be determined immediately after establishing the nature and extent of the accident based on the results of the territory survey and the sources of emergency emissions.

In case of recording emergencies related to environmental pollution, the management of the enterprise should inform about these facts the State Environmental Safety Administration of Almaty and the Department of Ecology of the AO to take measures to eliminate the consequences after accidents, determine the amount of damage to the components of the environment (air, soil, underground and surface water), make appropriate payments to the tax committee. After eliminating the emergency situation, the enterprise should correct the measures to prevent such situations.

After liquidation of an emergency situation, the above-mentioned types of observations pass to a permanent monitoring regime with a thickening of observation points (sampling) within the boundaries of the impact zone of the accident. These observations are carried out during the rehabilitation cycle of the territory, including within two years after its completion.

h. Schedule of internal inspections and procedure for elimination of violations of environmental legislation of the Republic of Kazakhstan

Internal inspections are conducted by personnel responsible for environmental protection.

Internal inspections monitor:

- 1) implementation of the activities provided for by the EMP;
- 2) adherence to production regulations and rules relating to environmental protection;
- 3) compliance with environmental and other permits;
- 4) the correctness of accounting and reporting on the results of industrial environmental monitoring;
- 5) other information that reflects the organization and conduct of industrial environmental monitoring.

An employee (employees) performing an internal audit shall:

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- 1) review the report on the previous internal audit;
- 2) to survey each object on which emissions to the environment are carried out;
- 3) to draw up a written report to the head, if necessary, including requirements to take measures to correct the non-conformities identified during the audit, the deadlines and the procedure for their elimination.

The schedule of internal audits is presented in Appendix 6.

The Contractor shall ensure the conduct of full scientific research.