Initial Environmental Examination

Project Number: 52286-001
November 2018

KAZ: CAREC Corridors 1 and 6 Connector Road (Aktobe–Kandyagash) Reconstruction Project

Prepared by the Ministry of Industry and Infrastructure Development for the Asian Development Bank.

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Final Draft – November 2018

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Abbreviations and Acronyms

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
AM	Accountability Mechanism
ADB	Asian Development Bank
AQP	Air Quality Plan
BAP	Borrow Pit Action Plan
BoQ	Bill of Quantities
BOD	Biological Oxygen Demand
CAREC	Central Asia Regional Economic Cooperation
CFC	Chlorofluorocarbon
CIS	Commonwealth of Independent States
CO	Carbon monoxide
COD	Chemical Oxygen Demand
CO_2	Carbon Dioxide
Cr	Chromium
dBA	decibel
DD	Detailed Design
EA	Executing Agency
EC	Electrical conductivity
EIA	Environmental Impact Assessment
EHS	Environmental Health and Safety
EMP	Environmental Management Plan
EM	Environment Manager
ERP	Emergency Response Plan
ES	Executive Summary
EU	European Union
FE	Iron
FS	Feasibility Study
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GoK	Government of Kazakhstan
GOST	Technical Standard
GRM	Grievance Redress Mechanism
GRCE	Grievance Redress Committee
ha	Hectare
H&S	Health and Safety
HC	Hydrocarbon
IBA	Important Bird Area
IFC	International Finance Corporation
IFI	International Finance Institutions
IEE	Initial Environmental Examination
IES	International Environmental Specialist
in/sec	Inch per second (25.4mm/sec)
IUCN	International Union for Conservation of Nature
km	Kilometer
km/h	Kilometers per Hour
Km^2	Square kilometer
LARP	Land Acquisition and Resettlement Plan
LC	Least Concern
LCF	Local Consulting Firm
L_{eaq}	Equivalent Continuous Level
mg/l	Milligram per liter
mg/m^3	Milligram per cubic meter
mg/kg	Milligram per kilogram
m	Meter
m^2	Square meter
m^3	Cubic Meter

m^3/s	Cubic meter per second
MAC	Maximum Allowable Concentrations
MPE	Maximum Permissible Emission
MPC	Maximum permissible concentrations
MPD	Maximum Permissible Discharges
MSDS	Material Safety Data Sheet
$MtCO_2e$	Million tons of CO_2 equivalent
NES	National Environmental Specialist
NGO	Non-Governmental Organization
NH_4+	Ammonium
Nm^3	Normal cubic meter
NO_X	Nitrogen oxides
NO_2	Nitrogen Dioxide
NO_3	Nitrate
Ni	Nickel
NT	Near Threatened
OHS	Occupational Health and Safety
OVOS	National EIA Procedures
PAP	Project Affected Person
PAH	Polycyclic aromatic hydrocarbons
PCR	Physical and cultural resources
PPV	Peak Particle Velocity
Pb	Lead
PM	Particulate matter
POPs	Persistent organic pollutants
PMU	Project Managing Unit
PPE	Personal Protective Equipment
PPTA	Project Preparatory Technical Assistance
PPM	Parts per million
SPM	Suspended Particulate Matter
RoW	Right of Way
SniP	Construction Standards
STD	Sexually transmitted diseases (such as HIV/AIDS)
SEMP	Specific Management Plan
SO_2	Sulfur Dioxide
SPS	Safeguard Policy Statement
TEPO	Territorial environment protection offices
TMP	Traffic Management Plan
TOR	Terms of Reference
TSP	Total Suspended Particulates
TSS	Total suspended solids
USD	United States Dollar
VU	Vulnerable
WBG	World Bank Group
WHO	World Health Organization
WMP	Waste Management Plan
°C	Degrees Celsius
$\mu g/m^3$	Micrograms per cubic meter

Currency Exchange Rates as of 01 October 2018
1 US$ = 366 (KZT)
($ refers in this report to US-Dollars)

Executive Summary

1. Introduction

1. This Initial Environmental Examination (IEE) is part of the process of compliance with the ADB Safeguard Policy Statement (2009) in relation to the reconstruction of CAREC Corridors 1 and 6 Connector Road (Aktobe – Kandyagash), or more simply, the "Project".

2. The IEE provides a road map to the environmental measures needed to prevent and/or mitigate negative environmental effects associated with the project. More specifically, the IEE:

- Describes the existing socio-environmental conditions within the Project area;
- Describes the project design, construction activities and operational parameters;
- Describes the extent, duration and severity of potential impacts;
- Analyzes all significant impacts; and
- Formulates the mitigation actions and presents it all in the form of an Environmental Management Plan (EMP).

3. Based on the existing ADB Environmental Safeguards Policy (2009), this Project falls under ADB's project Category B as the proposed project's potential adverse environmental impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects.

2. Project Background

4. The reconstruction of the Project road, which forms a portion of the A-27 (a key part of the Western Kazakhstan Transport Corridor (WKTC)), will be part of an overall network upgrade program that will also enhance existing links between Astana and the Caspian Sea port town of Aktau.

5. As a result of inadequate maintenance and lack of rehabilitation and/or reconstruction work over the years, the exiting road pavement has lost its structure and bridges and culverts can barely withstand the fast-rising traffic that serves the growing industry and commerce in the region. As the main transport artery of the region and connecting to rest of the country, the poor road condition has likewise caused negative social effects as the rural population feel somewhat disconnected and abandoned by the cities and district centers. Road connectivity has become a key development issue particularly for the western part of the country.

6. Besides benefits accrued to regional trade and transit traffic, improvements to this road will also improve access to markets and social services for local communities and stimulate development of non-oil sector industries that in return create more job opportunities and improve the regions living standards.

3. Project Description

7. The Project is a road rehabilitation project involving 89 km of the A-27 between Aktobe and Kandyagash (see Figure 1: Road Location Map). The Project road begins in the southern outskirts of Aktobe, the capital of Aktobe Oblast. The road broadly follows a southerly route until it reaches Kandyagash approximately 100 kilometers south of Aktobe. The project will be confined within the right-of-way with the exception of two proposed bypasses at Alga (KM 35-39) and Kandyagash (KM 88-104).

Figure 1: Road Location Map

Source: http://www.nationsonline.org/oneworld/map/kazakhstan-administrative-map.htm

8. The Project road will be constructed as a Category 1-B road between KM 11 and KM 89 and as a Category 2 road between KM 89 and KM 100. The main deference between the two categories is the number of lanes, four lanes for a category 1-B road and 2 lanes for a category 2 road. The pavement will be an asphalt pavement with a crushed stone base and a soil subgrade. The total thickness of the pavement will be 65 cm.

9. Twenty junctions are included in the design, as well as three intersections with traffic light regulation. These junctions and intersections will provide continued access to the population living within the Project area. Nine bridges are planned, most of which are short span except the two bridges crossing the Ilek river (150m) as part of the Alga bypass. Four overpasses have been included in the design along with two underpasses for the movement of cattle and a further two box culverts also designed for drainage and movement of cattle. Three traffic light controlled crossings are designed in the beginning, middle and end of the Bestamak village.

10. Two bypasses are planned, the first around Alga (KM 35-39) and the second at Kandyagash (KM 89-100). To prevent animals on the carriageway of the road the Project provides a mesh fencing on both sides of the road. Noise barriers have also been included in the design in the town of Bestamak.

4. Alternatives

11. Several alternatives have been assessed as part of the IEE, including:

12. The “No Action” Alternative - in this instance this is defined as a decision not to undertake the proposed construction of the Project Road. The “No Action” Alternative would

result in the continued deterioration of the road, bridges and drainage structures along the RoW, thereby impeding the economic development of the Project Area and the Aktobe region. All positive benefits would be foregone. The environmental impacts associated with road rehabilitation (such as noise and air quality impacts) and inconveniences (such as traffic diversions) would be avoided in the short-run. In the long run, however, the steadily declining state of the roadway would severely hamper economic development in the area. In addition, the poor condition of the existing road represents a safety hazard to road users and continuing to use the road in its current condition will undoubtedly result in an increased number of accidents on the road. In light of these considerations, the "No Action" Alternative is deemed to be neither prudent nor in the best interest of the local population and Kazakhstan as a whole or those with an interest in, and attempting to assist restoration of, Kazakhstan's well-being.

13. Alternative Alignments - The Project includes two bypasses around the towns of Alga and Kandyagash. The alternative to these bypasses is to continue to use the existing road which passes through the center of each town. In the case of Alga this would result in a number of resettlement and compensation cases. Impacts from increased levels of noise during the operational phase would also mean that noise barriers would almost definitely be required through the whole village. The town would be bisected by the highway leading to access issues, unless an appropriate number of underpasses or overpasses were constructed. In addition, the road would need to cross the existing railway which would require a large overpass in the center of the town which would have significant visual impacts. Currently traffic is often backed up in the center of the town as the rail crossing is closed to let rail traffic pass through the town. This results in idling engines as cars queue along the existing road in what is essentially a residential area. The option of bypassing Alga to the west is not considered prudent due to the proximity of the existing chemical plant in this area. In the case of Kandyagash the bypass similar impacts will be avoided compared with upgrading of the existing alignment, e.g. resettlement and compensation, noise and access. In addition, the bypass allows for the future growth of the city without impacts from the highway.

14. Alternative Transport Modes - The road corridor runs alongside an existing rail line, which connects Aktobe with Kandyagash and on to Aktau and other areas of Kazakhstan. This railway, although mostly single track, is capable of handling large freight and passenger trains, and is being further upgraded. However, the railway is considered necessary as part of a mix of transport modes, with rail promoted as the preferred mode for longer distance, containerized and bulk commodities, as this represents the most environmental and efficient mode of transport. On the other hand, the Project road is promoted for the local and regional movement of people and goods. Accordingly, the railway is not considered an alternative to the Project but as an additional component of the country wide transport network.

5. Description of the Environment

15. The topography of the Project area itself is an undulating plain with alternating flat ridges and flat plains that range from 236 meters above sea level (masl) at the start of the road in Aktobe to 250 masl in Bestamak and Alga and 300 masl at the end of the road in Kandyagash.

16. The surface soils mainly consist of light brown dry steppe soil types that mostly occupy carbonate rich sandy loam and clay. Top-soils of about 20 cm are generally poor in humus, up to 2 %. Salt crusts often appear at the soil surfaces. In the entire road corridor there are deposits of quaternary age. Among the quaternary deposits there are a variety of alluvial deposits of sandy loam and clay. Contaminated soils can be found around the chemical plant in Alga. However, the road will bypass Alga more than 3km to the east of the plant.

17. The Project road crosses several water courses, most of which are dry during the summer months. The main water course in the Project area is the Ilek River which the road crosses at two locations as part of the bypass around Alga. The Aktobe Reservoir which is constructed on the Ilek river, is also close to the Project road, within 250m at some locations.

Recent water quality monitoring of the Ilek river around Alga indicates that it comprises a high level of pollution, including heavy metals and organics substances (phenols).

18. According to a geoenvironmental survey conducted in 2008 near the chemical plant tailings ponds in Alga, concentrations of boron, fluorine, bromine, manganese, sodium, magnesium, and strontium in groundwater exceeded maximum allowable concentrations. However, drinking water in Alga town complied with all regulatory requirements of Sanitary Regulations and Norms.

19. The examination of seismic zoning of the road specified in the IEE of Aktobedorproject defines the entire area as “non-seismic”.

20. The climate of the project area is strongly continental with long winters, stable snow cover, and comparatively short, moderately hot summer. The salient features are large yearly and daily fluctuations of air temperatures, late spring, and early autumn frosts, deep soil freezing, and permanently blowing winds. The average yearly temperature of the project area is +5.2 °C.

21. Precipitation is the major factor for groundwater supply. Yearly precipitation ranges from 102 to 387 mm with average annual precipitation 332.1 mm. Maximum precipitation is during warm season (April to October) with maximum in June/July. A second, less distinct maximum, is in October – November. February is the driest month.

22. Air quality in the Project corridor has been monitored as part of this IEE. The results show that air quality is well below national standard limits and IFC guideline limits for SO2, NO2, CO and Suspended Particles (dust).

23. Within the immediate vicinity of the Project road, i.e. within 25-50 meters very few trees can be observed – most of this land is degraded by human activity and animal grazing. Mainly the road traverses open steppe and where trees can be observed they are mostly strips of planted species outside of the right of way that will not be impacted by Project works. Wildlife along the Project road corridor is typical for a steppe-desert ecosystem. Among mammals, the most common species are rodents such as ground squirrels, hamsters, voles, rabbits, and jerboa. No special status flora and fauna have been identified within the Project corridor with the exception of the IUCN (VU) Carp which can be found in the Ilek river. No Saiga antelope can be found within, or close to, the Project area. These conclusions were conformed as part of consultations with the Department of Natural Resources Management and Regulation of Nature use, Aktobe Region. There are no protected areas or Important Bird Areas within, or close to, the Project area.

24. The prevailing land-use in the project area is cattle grazing (mostly horse and sheep grazing) because of the vastness of desert and steppe terrain. Crop and vegetable production is less prevalent in the Project area although patches of agricultural land can be noted along the Project corridor. Within the Project area main the main sources of employment include the oil & gas industries, cattle breeding, retail business (mostly small shop-keeping) and the public sector (rayon and village akimat administrations). The registered unemployment rate in the project rayons as of July 2015 is rather lower, about 0.2%.

25. Within the Project corridor a number of cemeteries, mosques and other cultural resources can be noted. Several are within 50 meters of the existing road.

26. Noise levels within the existing project corridor are dominated by noise from road traffic. Noise from the relatively infrequent train movements on the railway line is insignificant due to its distance from the road. No significant point sources of noise are present within the Project corridor. Most of the Project road avoids residential areas, except for the portion which runs through Bestamak. Here residential and commercial properties line the road, although in general most homes and commercial properties are located more than 20 meters from the edge of the existing road and also have some element of noise protection via fencing and walls that can be seen around nearly all properties within this part of Bestamak. Baseline

noise monitoring has been undertaken at four locations within the Project corridor during September 2018. The results of the monitoring show that noise levels are very consistent in the urban areas and are nearly always below IFC guideline limits for daytime and nightime noise with the exception of the nightime periods between ten and eleven, but even in these cases the noise limits are only slightly exceeded.

6. Impact Identification

27. The following provides a summary of the potential impacts associated with the roads:

Design / Preconstruction Phase

28. Air Quality – lack of foresight in the siting of construction camps, rock crushing plants, concrete batching plants in the pre-construction phase could lead to significant air quality impacts in the construction phase, especially to sensitive receptors.

29. Soils – Soil erosion can occur on embankments and around structures if adequate consideration of this issue is not taken into account in the design phase.

30. Hydrology - During design, all drainage works have been designed based on the historical flood data and flood forecasting. A design discharge of 50 years return period is considered for culverts, and 100 years of bridges. Accordingly, failure of structures is not anticipated.

31. Climate Change – A recent study of climate change study impacts for the Aktobe – Makat IEE (2015) identified change in temperature and change in precipitation as potential climate change issues in the future. These issues could lead to deterioration of the pavement and damage to drainage structures if they are not considered further as part of the detailed design.

Construction Phase

32. Air Quality - During construction of the road, air quality may be degraded by a range of operational activities including; exhaust emissions from construction machinery; open burning of waste materials; and dust generated from haul roads, unpaved roads, exposed soils, material stock-piles, etc. This can lead to health impacts to locals and impacts to ecology and crops.

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

34. Contaminated soils are known to be present at the Alga chemical plant and potentially in other areas of Alga. The Project road includes the bypass of Alga 3km to the east of the town and the chemical plant and as such contaminated soils are not anticipated to be present in the area of the bypass works. The rehabilitation of the existing road through Alga involves the removal of the existing layer of asphalt and the relaying of a new layer of asphalt within the existing pavement area. These works are short term and limited to the existing pavement area. No soils around the existing road will be excavated and as such no contaminated soils are expected to be excavated that would require special conditions for their handling, storage and disposal. However, to be prudent health and safety measures have been outlined below to prevent potentially contaminated dust affecting workers.

35. Surface Water – Impacts to surface water and groundwater could occur through improper operation of construction camps, asphalt plants, etc. Poor construction management around bridges and close to surface watercourses could also lead to pollution incidents. Without due care temporary drainage structures may also fail, or get obstructed with construction debris, leading to flooding of property and access roads.

36. Technical water may be sourced from the Aktobe reservoir and the Ilek river. The required amounts, potentially 200 m^3 per day are insignificant given the availability of water in the reservoir, however, abstraction form the Ilek during low flow periods may have greater impacts on the river.

37. The most recent water quality monitoring undertaken in the Ilek indicates that the river exceeds maximum allowable concentrations for a number of parameters, including boron, some heavy metals and phenols. These exceedances were only identified downstream of the Alga Chemical Plant in Alga and in the chemical plant tailing ponds.

38. Groundwater – Impacts to groundwater include spills and leaks of hazardous liquids used at construction sites and camps and potential impacts to groundwater resources during tunnel construction (discussed in more detail below).

39. Bridge Construction - Bridge construction activities may increase silt load in the river during construction at bridge sites and may result in accidental spillage of concrete and liquid waste into the river. This may impact upon the ecology of rivers and aquatic wildlife.

40. Biodiversity – No special status flora or fauna has been identified within the Project area (which has been modified to a large extent by human activity and use as pasture land for grazing) except for the Carp (*Cyprinus carpio*) - IUCN Status: Vulnerable, which can be found in the Ilek river in the area of the proposed bridge crossings around Alga. Construction of the two bridges will likely impact on these fish to some degree and mitigation measures will be required to limit these impacts.

41. Protected Areas – No protected areas or important bird areas (IBAs) can be found within, or close to, the Project area.

42. Infrastructure - The main impacts resulting from Project works will be road diversions and some temporary blocking of access routes, this includes a proposed diversion in Bestamak, that passes one of the main schools in the town. In some locations road closure will be needed and may occur for periods between one and two hours and as such is not a significant issue as long as the local population are given notice of the delays and suitable detours are provided. Use of local roads may also be damaged by large trucks transporting materials to and from the various work sites along the alignment. There is also the potential for a school in Bestamak to be impacted if the proposed diversion in Bestamak proposed by KazAvtojol is used.

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

44. Waste - Road construction will inevitably generate solid and liquid waste products including inert waste (e.g. concrete, wood, plastics, etc.) and hazardous waste (e.g. waste oils, batteries, etc.). Approximately 50,000 m^3 of asphalt will be excavated from the existing pavement. In addition, uncontrolled discharges of sewage and 'grey water' (e.g. from washrooms and canteens) from construction sites and worker's camps may also cause odors and pollute local water resources.

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

46. Community Health and Safety – Construction activities may result in an increase in road traffic accidents between vehicles, pedestrians and vehicles and livestock and vehicles. There will also be short term impacts to noise and air quality, which may impact upon health. Migrant workers may also increase community health and safety risks, for example, through the spread of sexually transmitted diseases.

47. Occupational Health and Safety - Workers' rights including occupational health and safety need to be considered to avoid accidents and injuries, loss of man-hours, labor abuses and to ensure fair treatment, remuneration and working and living conditions.

48. Physical and Cultural Resources - Several cemeteries, monuments and mosques can be found within the Project corridor. It is also possible, given the rich cultural heritage of Kazakhstan, that chance finds could occur during excavation works.

49. Noise - The potential noise related issue during construction of the project is disturbance to sensitive receptors in the Project area. The main sources of noise and vibration during construction of the project included; a) Construction machinery, b) Drilling activities, c) Haulage and general vehicle movements, d) Concrete mixing and aggregate production systems; and e) Construction Camps / Ancillary Facilities.

50. In general construction activities will result in elevated noise levels over quite a wide distance, as much as 200-300 meters. However, much of the project corridor is uninhabited, or bypasses the major towns within the alignment and therefore there will be no impacts to sensitive receptors in these areas. There are in fact only three locations where construction noise is likely to impact upon sensitive receptors and residential properties. The first is at the start of the Project road between KM0.0 and KM0.5. The second is in Bestamak where the Project road will pass directly through, and the third is the town of Alga, but this only refers to the rehabilitation of the existing pavement through the town.

51. Vibration – Construction activities may also result in vibration. The effects of vibration includes annoyance, sleep disturbance, and potential damage to structures. Due to the fact that most of the Project road is uninhabited the potential for impacts from construction vibration on people and properties is limited to the area of Bestamak and KM 0.0 – KM 0.5.

52. The residential properties in the area of KM 0.0 – KM 0.5 are located more than 50 meters from the road centerline, or around 40 meters from the edge of the Project road. The planned construction activities should not result in vibrations levels above 5mm/s, the limit above which cosmetic damage to properties can occur. In Bestamak the situation is different. The Project road in this location includes the main four lane pavement and slip roads either side of the main pavement, meaning that at some parts of Bestamak construction will occur more or less up to the fenced boundaries of some properties. Most properties are located around 5 meters of so behind the fenced boundaries, but several are within one or two meters of the boundary wall meaning that they could be within 5 meters of the construction zone. Using compactors and vibratory rollers could have a significant impact upon properties in this area, potentially even causing structural damage to the properties located within 5m of any such works.

Operational Phase

53. Air Quality – The main source of air pollution during the operational phase will be vehicles moving on the highway. The main pollutants are: CO; NO_X; hydrocarbons (HC); SO_2; carbon dioxide (CO_2); and particulate matter (PM). Given the relatively low population levels within Project corridor, it is unlikely that increased traffic volumes will have significant impacts to residents health in terms of NOx, CO and PAH pollution. In addition, once completed, current high levels of PM in areas where the road condition is poor will be reduced. Improved vehicle performance on a new better road surface will also serve to alleviate potential air pollution levels to a modest degree.

54. Noise – The Project road, once operational, passes mainly through unoccupied land. Once the road is completed bypasses will also exist around Alga and Kandyagash. Accordingly the only residential areas that maybe affected by elevated noise levels are KM 0.0 to KM 0.5 and Bestamak. A noise was model prepared as part of the EIA to examine future scenarios with and without noise barriers.

55. The results of the model at KM0.0 – 0.5 show that the noise barrier is effective at reducing noise levels below IFC guideline limits for daytime and nightime noise and that without the barriers noise levels are predicted to be above the limits. The only exception is the nightime period in 2040 where two receptors will be 1 and 2 dBA above the nightime limit. However, this is not considered a significant impact.

56. The results of the model in Bestamak show that the planned noise barrier is effective at reducing noise levels below IFC guideline limits for daytime and nightime noise in the first year of operation (2020) and that without the barriers noise levels are predicted to be above the limits. After ten years (2030) the situation changes slightly. The noise barriers still help keep noise levels below the IFC guideline limits for daytime noise, however several receptors are only slightly above the more stringent nightime limits of 45 dBA. After twenty years the model indicates that some receptors will be within the daytime and nightime limits and others above, a mixed bag of results. In general the nightime limits will be exceeded by 1-3 dBA in the noise barrier scenario. However, in general the results for Bestamak show that the noise barrier has a very positive impact on noise reduction decreasing predicted noise levels by as much as 14 dBA in some instances. By 2040 the model indicates that the noise barrier may not keep noise levels at the facades of the identified receptors below IFC guideline limits. Obviously this is a very long term scenario and a range of factors may see noise levels reduce over time, e.g. through the introduction of quieter engines, and the evolution of the electric car.

57. Vibration - Highway traffic is not likely to have any measurable impact on the structures or on comfort.

58. Health and safety – Rehabilitation of the road will result in numerous beneficial health and safety impacts, including; reduced dust levels, faster emergency response times; improved pedestrian crossing facilities and improved road geometry.

59. Employment and Business - Although the existing road will remain open for almost its entire extent and interchanges will be constructed to access the existing road from the new alignment, it is likely that a number of roadside market traders in Alga and Kandyagash will be impacted by the reduced traffic levels on the existing road. After the Project construction phase many local workers may be without employment. However, the Project will have provided them, in many instances, with additional skills and experience to work on similar projects in other locations.

60. Induced Impacts – It is possible that construction of the new road could induce development along the corridor to some extent, however land use planning and the procedures for permitting of new developments along the corridor is largely beyond the scope of this project.

7. Mitigation and Management Actions

61. The summary mitigation and management measures for the potential impacts identified above for the Roads include:

Design / Preconstruction Phase

62. Specific Environmental Management Plan (SEMP) - The SEMP will describe the precise location of the required mitigation / monitoring, the persons responsible for the mitigation / monitoring, the schedule and reporting methodology. The SEMP will also include the following plans:

(i) Topic Specific Plans:

(a) Waste Management Plan.
(b) Traffic Management Plan.

(c) Occupational Health and Safety Plan.
(d) Emergency Response Plan.
(e) Air Quality Plan.
(f) Spill Response Plan.
(g) Vibration Monitoring Plan.
(h) Noise Management Plan.
(i) Construction Vibration Management Plan

(ii) Site Specific Plans:

(a) Construction Camp Plan.
(b) Bridge Construction Plan (for each bridge construction site)

63. The SEMP will be submitted to the Engineer and KazAvtojol for approval at least 30 days before taking possession of any work site. No access to the site will be allowed until the SEMPs are approved by the Engineer and KazAvtojol. New topic specific or site specific EMPs may also need to be developed by the Contractor during the construction phase. These new plans will also need to be approved by the Engineer and KazAvtojol.

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

65. Siting of Facilities – Locations for rock crushing facilities, concrete batching yards and asphalt plants will require approval from the Engineer and KazAvtojol during the Pre-construction phase. Efforts will be made to ensure that these facilities are as near to the Project road as practical to avoid unnecessary journeys and potential dust issues from vehicle movements during construction works on unpaved roads in urban areas. Haul routes will be prepared and submitted to the Engineer as part of his Traffic Management Plan (TMP). To prevent impacts arising from asphalt plants, construction camps, batching plants and rock crushing plants, they will be prohibited within 1km of any residential area or sensitive receptor (school, hospital, etc).

66. Air Quality - To adequately manage air quality impacts the Contractor, as part of his SEMP, will be responsible for the preparation of an Air Quality Plan, and Emergency Response Plan, a Health and Safety Plan and a Traffic Management Plan. To prevent impacts arising from asphalt plants, construction camps, batching plants and rock crushing plants, they will be prohibited within 1km of any residential building or sensitive receptor (school, hospital, etc).

67. Soils – The Contractor will be responsible for preparation of a Spill Response Plan which will cover measures for the management of accidental spills and leaks of hazardous liquids at all camps and work sites and measures to dispose of any contaminated soils.

68. Water Use - The Contractor shall ensure he has in place all relevant permits for the use of technical water.

69. Bridge Design - Bridge designs will ensure that drainage from bridge decks over 50 meters do not discharge directly to the watercourses beneath the bridges. Discharge waters will lead to an oil/grease interceptor tank or filter pond adjacent to the bridge in order to trap oil and grease run-off. In addition, the bridge design and layout must be aesthetically pleasing and in harmony with the existing environment. The Contractor shall also prepare a Bridge Construction Plan prior to the starting of works at any bridge construction site.

70. Drainage Design - During design, all drainage works have been designed based on the historical flood data and flood forecasting. A design discharge of 50 years return period is considered for culverts, and 100 years of bridges.

71. Biodiversity – A Carp Management Plan shall be prepared by the Contractor outlining the mitigation measures and program for managing impacts to Carp during the construction

period. The plan shall comply with the current legislation of the Republic of Kazakhstan and control of the authorized body for the protection of fish resources.

72. Infrastructure - A road condition survey will be conducted by the Engineer prior to construction in order to gauge the damage to the road as a result of the intensive heavy traffic. Before completion of the Project the Engineer shall repeat the survey to determine which, if any roads need to be repaired by the Contractor. The Contractor will also submit a Traffic Management Plan to local traffic authorities prior to mobilization and include the plan as part of his SEMP.

73. Waste Management – The Contractor shall prepare and submit a Waste Management Plan outlining measures to manage and disposal of all waste streams, including hazardous waste and methods for recycling waste (including asphalt). The plan will clearly identify how and where hazardous wastes will be disposed of.

74. Emergency Response - The Contractor will be responsible for preparation of an Emergency Response Plan which will include sections relating to; a) Containment of hazardous materials, b) Oil and fuel spills, c) Fire, gas leaks and explosions, d) Work-site accidents; and e) Earthquake and other natural hazards.

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

76. Noise – A noise model prepared for this EIA has confirmed that the noise barriers proposed for Bestamak have beneficial impacts should be installed and that the design should also include noise barriers at KM 0.0 – KM 0.5 with the same specification as those proposed for Bestamak. Correct siting of construction camps and ancillary facilities will reduce the potential for elevated noise levels to affect sensitive receptors. Locating these facilities more than 1km downwind of sensitive receptors and residential properties will limit potential noise impacts. In addition to the above, prior to the start of construction, and as part of his SEMP, the Contractor will develop a noise management plan.

77. Vibration – Prior to the start of construction the Contractor will prepare a Construction Vibration Management Plan.

Construction Phase

78. Air Quality - Proper control, siting and maintenance of equipment, including concrete batching plants, shall mitigate emissions impacts. Spraying of roads with water during dry periods and covering of friable materials will also help prevent dust impacts, this is particularly relevant where the Alga road rehabilitation works are planned and specific water spraying measures are planned for this to reduce the potential impacts of contaminated dust impacting upon workers.

79. Soils – Standard measures are outlined within the EMP to reduce the impacts of potential spills and leaks. They include storing hazardous liquids in special storage areas within concrete bunds and the provision on spill kits in these areas. Erosion control measures and measures to preserve topsoil are also recommended within the EMP. For borrow pits requirements have been established in this IEE for due diligence reviews of existing borrow pits and preparation of Borrow Pit Action Plans for any new borrow pits.

80. Surface water – Proper design, siting and management of facilities (including construction camps and concrete batching plants) will help reduce impacts to water quality. Accidental spills could occur, and provisions are recommended in the EMP to manage such accidents. Temporary drainage in villages will be kept clear of construction debris to prevent flooding at work sites. Extraction of water for uses as technical water from the Ilek river will be

prohibited during low flow periods, as determined by the Engineer and in line with the permit mentioned above.

81. Drainage and Flooding - During the construction phase the Contractor will be required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage to properties and land by flooding and silt washed down from the works. Should any operation being performed by the Contractor interrupt existing irrigation systems, the Contractors will restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption. The Contractor will also be responsible for ensuring that no construction materials or construction waste block existing drainage channels within the Project corridor. The Engineer will be responsible for routine monitoring of drainage channels to ensure they remain free of waste and debris.

82. Biodiversity – The Contractor must implement the Carp Management Plan with oversight from a national fish specialist.

83. Infrastructure - The Contractor will continually provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions and allow for adequate traffic flow around construction areas via diversions or temporary access roads.

84. Utilities - During construction all utilities in the Project area shall be kept operational, particularly during the winter months.

85. Waste Management - The Contractor will be responsible for the safe collection and removal of all waste materials from his site. Accordingly, he shall prepare contracts with a suitably licensed waste management contractor for the removal of inert and hazardous wastes from his sites. The Contractor as proof of the shipment of these wastes shall also keep waste manifests.

86. Asphalt Plants, Concrete Batching Plants and Construction Camps – The Project EMP provides a range of detailed mitigation and management measures for these facilities. All of these measures are based on international best practice.

87. Community Health and Safety – The Contractor will be responsible for holding monthly community meetings within the Project area throughout the construction period. The monthly meetings will be held in the villages along the alignment and will provide a forum for locals to discuss specific issues, such as noise and dust, with the Contractor before making complaints formal through the Grievance Redress Mechanism.

88. Occupational Health and Safety - Health and safety plans, training and HIV/AIDS and vector borne disease awareness programs will be provided by the Contractor. The Contractor shall also be responsible for providing adequate Personal Protective Equipment for all workers, including sub-contractors and site visitors (this includes specific PPE for working around rivers and around the Alga Chemical Plant). If groundwater is to be used as potable water, it will be tested weekly to ensure that the water quality meets the GoK drinking water standards.

89. Physical and Cultural Resources - During the construction phase works shall be schedule that no works occur within 250 meters of the Mosque on Fridays, or during religious holidays. Fencing around the cemeteries at KM 62 and KM 71 shall also be provided throughout the construction phase to ensure there is no encroachment into this area.

90. Noise – The Contractor will be responsible for implementing the range of good practice measures outlined in this IEE and its EMP to limit construction noise impacts, including time and activity constraints. Noise barriers at KM 0.0 – 0.5 should also be constructed in addition to those already proposed in Bestamak. To limit the aesthetic impact of the barriers and

potential blocking of light, it is recommended that the barriers be constructed from a transparent material.

91. Vibration - During the construction phase the contractor shall strictly follow his Construction Vibration Management Plan, including monitoring of vibration and the use of alternative construction methods if vibration levels are deemed unacceptable.

Operational Phase

92. Hydrology - During the operational phase of the Project, KazAvtojol will be responsible for monitoring drainage along the road to ensure that it does result in increased run-off and flooding. KazAvtojol will be responsible for rectifying this issue if it occurs.

8. Monitoring Actions

93. To ensure that all of the above mitigation actions are completed according to the requirements of this IEE, monitoring shall be undertaken of Project works by the Engineer and by independent monitoring specialists. Specifically, both observational monitoring and instrumental monitoring shall be undertaken as follows:

94. Instrumental Monitoring – This shall be completed by independent specialists and will include; a) Routine air quality, water quality soil sampling and noise monitoring during the construction phase; and b) Annual noise monitoring throughout the Project operational lifecycle at the receptors identified as part of the noise model.

95. Schedules, parameters, locations are indicated by the EMP. The Engineer shall be responsible for contracting independent monitoring specialists during the construction phase.

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

9. Consultations

97. All of the issues identified in the consultations have been included within the impact assessment portion of the IEE and where practical, measures have been proposed to reduce the significance of, or mitigate impacts. **Section H** of the Report provides details of the consultation procedures and the main comments received.

10 Conclusions

98. This IEE has established that in general there are no significant environmental issues that cannot be either totally prevented or adequately mitigated to levels acceptable GoK and international standards for Project activities.

99. The EMP, its mitigation and monitoring programs, contained herewith will be included within the Project Bidding documents for project works. This ensures that all potential bidders are aware of the environmental requirements of the Project and its associated environmental costs.

100. The Bid documents state that the Contractor will be responsible for the implementation of the requirements of the EMP through his own Specific Environmental Management Plan (SEMP) which will adopt all of the conditions of the EMP and add site specific elements that are not currently known, such as the Contractors construction camp locations.

101. The EMP and all its requirements will also be added to the Contractors Contract, thereby making implementation of the EMP a legal requirement according to the Contract. He will then prepare his SEMP which will be approved and monitored by the Engineer. Should the Engineer, through routine monitoring by his national and international environmental specialists, note any non-conformance with the SEMP the Contractor can be held liable for breach of the contractual obligations of the EMP. To ensure compliance with the SEMP the Contractor will employ an Environmental Officer to monitor and report Project activities throughout the Project Construction phase.

102. A grievance redress mechanism (GRM) has also been prepared as part of the Project. The GRM provides a structure for stakeholders to make complaints and a mechanism for the complaints to be resolved both locally and centrally.

A. Introduction

A.1 Purpose of the IEE Report

104. This Initial Environmental Examination (IEE) is part of the process of compliance with the ADB Safeguard Policy Statement (2009) in relation to the reconstruction of CAREC Corridors 1 and 6 Connector Road (Aktobe – Kandyagash), or more simply, the "Project".

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

106. More specifically, the IEE:

(i) Describes the existing socio-environmental conditions within the Project area;
(ii) Describes the project design, construction activities and operational parameters;
(iii) Describes the extent, duration and severity of potential impacts;
(iv) Analyzes all significant impacts; and
(v) Formulates the mitigation actions and presents it all in the form of an Environmental Management Plan (EMP).

107. The IEE is based around the findings of the national EIA (OVOS) which was prepared by KazAvtojol in 2015/2016 as part of the detailed design of the Project and approved as part of the State Environmental Review process.

A.2 Category of Project

108. Based on the existing ADB Environmental Safeguards Policy (2009), this Project falls under ADB's project Category B as the proposed project's potential adverse environmental impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects.

A.3 Identification of the Project and Project Proponent

109. The proponent for this Project is the Government of Kazakhstan (GoK) acting through its Ministry of Investments and Development (MID). The Implementing Agency (IA) is the and its Committee of Roads (CoR) and its road agency KazAvtojol.

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

A.4 The Nature, Size, Location and Importance of the Project

111. The Project activities funded by the ADB will comprise upgrading of 89 km of the national highway A-27 (see **Figure ES-1**). Administratively, the road is located in Alga and Mugalzhar districts of Aktobe Oblast. The project will be confined within the right-of-way with the exception of approximately 16km of bypass around the town of Alga and 14km of bypass around Kandyagash. The proposed Project will enhance regional cooperation and inclusive economic growth in Kazakhstan, particularly in the Atyrau and Aktobe provinces and will improve quality and efficiency of road transport service.

A.5 IEE Boundaries

For purposes of establishing the environmental conditions, the overview of regional data is followed by the description at the project level if data is available. This IEE covers the entire length of the Project Road funded by the ADB (89 km). For purposes of this impact assessment, an envelope of 200 meters wide on each side of the project road over its entire length is identified as the primary impact area ("Project Area" or "Project Corridor"). This distance takes into account the common impacts associated with road works such as noise, dust and emissions. However, the project impact area maybe widened depending on conditions on the ground and with regard to specific construction sites outside of the right of way (RoW – the Project road RoW is 50 meters), e.g. borrow pits and quarries. The road sections where sensitive receptors are present, such as schools, hospitals or other places where people congregate are given particular attention so that ample mitigation is formulated. For road sections that cross rivers, the impact assessment is expanded to cover the identified continuous extent of any ecologically important habitats / features along the Project Corridor.

A.6 Methodology Applied

112. The methodology is based on the ADB, Safeguard Policy Statement (2009) and the joint experience of the International and National environmental consultants involved in the IEE.

113. Background data and information was obtained from published and unpublished sources, e.g., on: climate, topography, geology and soils, natural resources, flora and fauna, agriculture, and socio-economic data. In addition, background data has also been obtained from the recently prepared Project OVOS.

114. Several site inspections were conducted jointly by the International Environmental Specialist and National Counterpart during August and September 2018. The existing road was driven and areas of potential environmental significance assessed carefully.

115. Discussions were held with a number of stakeholders in order to determine their perceptions of the level of impact from road works (see **Section H**). Data and information obtained have been incorporated where appropriate in the IEE Report, this includes the inclusion of recommendations made in the Project OVOS, for example relating to the Carp mitigation measures required for the works in the Ilek river.

A.7 Structure of the Report

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

Section A: Introduction – The section in hand provides the introductory information.

Section B: Description of the Project – Section B describes the Project need and its environmental setting. A scope of works is also provided indicating the type of engineering works required.

Section C: Analysis of Alternatives – This portion of the report provides an analysis of alternatives, including the 'no project' option.

Section D: Legal, Policy and Administrative Framework - This section presents an overview of the policy/legislative framework as well as the environmental assessment guidelines of Kazakhstan.

Section E: Methodology – This portion of the report provides the methodology for completion of the IEE, including the procedures followed for monitoring, surveys, modeling, etc.

Section F: Description of the Environment – This section of the report discusses the regional and local environmental baseline conditions. This section is divided into subsections relating to:

(i) Physical Environment: including geology; topography; soils; climate; air quality; noise; surface water; groundwater, etc.
(ii) Biological Environment: flora and fauna, protected areas.
(iii) Human Environment: demographics; employment and socio-economics; land use; infrastructure (including local access roads); cultural heritage; archaeology; waste management; etc.

Surveys have been conducted to address important gaps in the existing data and to collect up-to-date information on topics and areas where significant negative impacts are expected.

Section G: Environmental Impacts and Mitigation Measures – Section G outlines the potential environmental impacts and proposes mitigation measures to manage the impacts.

Section H: Environmental Management Plan – This section provides the EMP for the design, construction and operational phases of the Project.

Section I: Public Consultation, Information Disclosure & Grievance Mechanism – Section I provides a summary of all of the stakeholder consultation activities undertaken. The section also describes the grievance redress mechanism, setting out the mechanisms for resolving complaints about environmental performance.

Section J: Conclusions and Recommendations – The final section of the report provides the report conclusions and recommendations, including a description of any residual impacts.

B. Project Description

B.1 Type of project and Category

117. The Project is a road rehabilitation project involving 89 km of national highway A-27 between Aktobe and Kandyagash in the Republic of Kazakhstan. The project will be confined within the right-of-way with the exception of two proposed bypasses at Alga (KM 35-39) and Kandyagash (KM 88-104).

118. Based on the existing ADB Environmental Safeguards Policy (SPS 2009), this Project falls under ADB's project **Category B**. According to SPS 2009:

"*A proposed project is classified as category B if its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. An initial environmental examination is required.*"

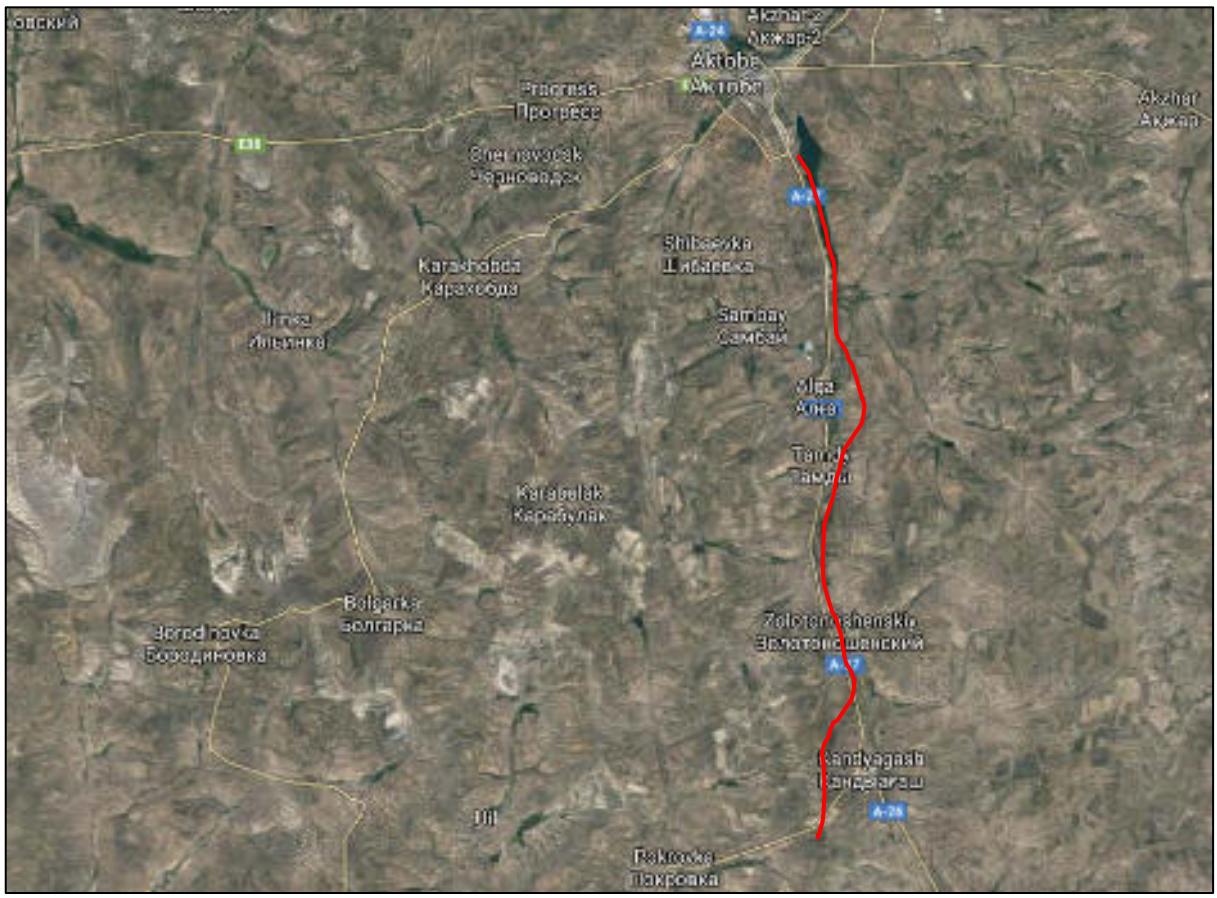
B.2 Project Location

96. The Project road begins in the southern outskirts of Aktobe, the capital of Aktobe Oblast. The road broadly follows a southerly route until it reaches Kandyagash approximately 100 kilometers south of Aktobe. The road is relatively flat and passes through one village (Bestamak) and will bypass several others, including Alga and Kandyagash.

97. **Figure 2** provides the location of the Project road within the context of Kazakhstan. **Figure 3** provides a satellite image of the Project road in a regional context. **Appendix A** provides detailed mapping of the Project road including chainages and **Appendix B** provides an overview of the environmental setting of the road.

Figure 2: Project Road Location

Figure 3: Aktobe – Kandyagash Road



B.3 Need for the Project

119. Roads promote connectivity and mobility, which is a precondition for growth and development particularly for Kazakhstan the world's largest landlocked country with the population density among the lowest (at less than 6 people per square kilometer) while having the largest and strongest performing economy in Central Asia. The proposed Project will reconstruct about 89 km of the A-27, a key part of the Western Kazakhstan Transport Corridor (WKTC). This will enhance regional in particular western Kazakhstan road connectivity and mobility, improve quality and efficiency of road transport service, and promote inclusive economic growth in the western part of the country.

120. With a land area (about 2.7million km^2) larger than Western Europe, an estimated 17.4 million population (as of 2014) and abundant natural resources unevenly spatially distributed, the provision of adequate road transport infrastructure across the country is critical. Strategically, Kazakhstan has huge potential to link the fast growing markets of China and East Asia with Russia and Western Europe by road and rail, and through ports on the land-locked Caspian Sea. For instance, the total volume of goods in transit through Kazakhstan in 2012 amounted to 17.8 million tons, income from which amounted to more than $1 billion. Long travel distances result in significant travel times and costs for accessing markets within the region and beyond. A World Bank study estimated that transport costs account for 8 - 11 % of the final cost of goods about double the cost in most industrialized countries. As such, the development of transport infrastructure coupled with sector efficiency improvement will perform a catalytic role for sustaining the social and economic development of the country.

121. Reckoning that the successful integration of Kazakhstan into the world economy relies on, among other investments, a well-developed transport system in the country, the government has, since 2007, been reconstructing and/or upgrading the 2,787 km Kazakhstan

section of the Western Europe - Western China (WE-WC) international transit corridor (also known as the CAREC corridors 1b and 6b) to turn it into a truly international trunk corridor. The entire project is estimated to cost $6.5 billion and is mainly co-financed by development partners including ADB, the European Bank for Reconstruction and Development (EBRD), the IsDB, the Japan International Cooperation Agency (JICA) and the World Bank.

122. With the reconstruction of WE-WC Corridor near completion, additional national transport corridors of strategic importance and regional impact, known broadly as the Centre South (Astana / Almaty), Centre East (Astana / Ust'-Kamenogorsk) and Centre West (Astana / Aktau) corridors, are being developed by the government and development partners. These corridors are estimated to cost $6.6 billion and planned for implementation during 2016-2020.

B.3.1 Project Road

123. The reconstruction of this portion of the A-27 will be part of an overall network upgrade program that will also enhance existing links between Astana and the Caspian Sea port town of Aktau.

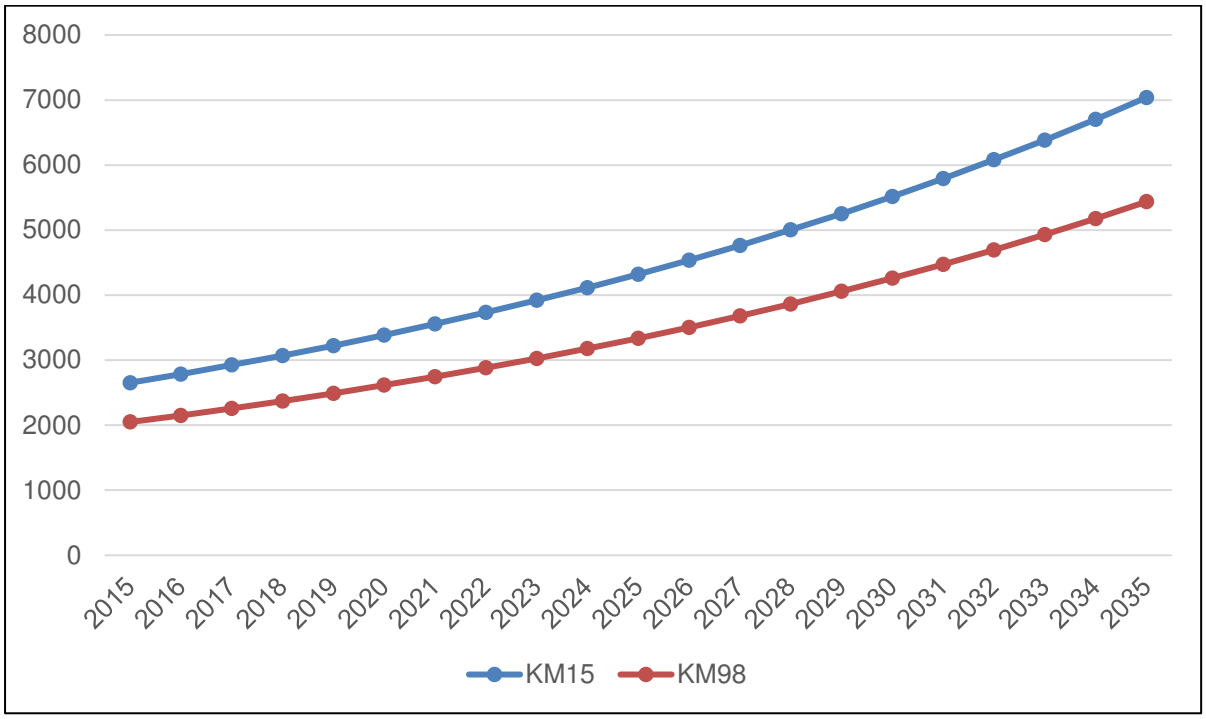
124. As a result of inadequate maintenance and lack of rehabilitation and/or reconstruction work over the years, the road pavement has lost its structure and bridges and culverts can barely withstand the fast rising traffic that serves the growing industry and commerce in the region. As the main transport artery of the region and connecting to rest of the country, the poor road condition has likewise caused negative social effects as the rural population feel somewhat disconnected and abandoned by the cities and district centers. Road connectivity has become a key development issue particularly for the western part of the country.

125. Besides benefits accrued to regional trade and transit traffic, improvements to this road will also improve access to markets and social services for local communities and stimulate development of non-oil sector industries that in return create more job opportunities and improve the regions living standards.

126. As the Ministry of Investments and Development (MID) and its Committee of Roads (CoR) embark upon the next stage of nationwide road network upgrading, continued institutional and capacity development, i.e., follow-on implementation of functions under development and scaling-up what has been functioning well, will be needed for further improvements in transport efficiency and quality of service. The core problem of an inefficient road transport system, attributable to unbalanced road connectivity and deteriorated roads coupled with substandard services, is that it increases transport costs and constrains the country s integration into the global economy. This ultimately hampers sustainable social and economic development. Recent reports have indicated that in some of the road sections traffic growth is actually negative due to the deteriorating road condition and the reluctance of people to use the road.

127. KazAvtojol estimate that road traffic on the rehabilitated road will increase by an average of 5% annually over the 20 year lifecycle of the Project. Figure 4: Traffic Forecasts, 2015 - 2035 illustrates the predicted traffic volume increases based on the most recent traffic counts for KM 15 (Aktobe) and KM 98 (Kandyagash).

Figure 4: Traffic Forecasts, 2015 - 2035



94. According to data provided in the Aktobe – Makat IEE (2015) most of the accidents recorded on the Aktobe section of the A-27 result from vehicle roll-overs due to high speed, these have caused a high number of deaths compared to the number of accidents. Improvements to the road condition and geometry will help reduce accident rates per capita.

B.4 Road Design

B.4.1 Road Standards

128. The highway A-27 "Aktobe-Atyrau-border of the RF (to Astrakhan) is classified as an international road and according to Enclosure A of Table 1, SNiP RK 3.03.09-2006 and is a motorway of international importance, access to which from other roads is possible only through Interchanges. The Project road will be constructed as a Category 1-B road between KM 11 and KM 89 and as a Category 2 road between KM 89 and KM 100. Table 1 provides the SNiP indicators and how these have been incorporated into the design.

Table 1: Category 1-b Road Standards

Description of parameters	Indicators on the SNiP 3.03-09.2006*	Design
Road category	*I –B*	*I –B*
Estimated traffic speed, km/h	120	120
Quantity of traffic lanes, un.	4	4
Width of traffic lanes, m	3.75	3.75
Width of the carriageway, m	15,0	15,0
Width of the median, m	not less than 5 m	5.0
Width of the shoulder, m	3.75	3.75
Width of the strengthened lane by type of main road:		

Description of parameters	**Indicators on the SNiP 3.03-09.2006***	**Design**
- from the side of median, m	1.0	1.0
- from the side of shoulder, m	not less than 0,75m	0,75
Width of subgrade, m	27.5	27.5
Cross slope of the carriageway and strengthened lane,	20	20
Cross slope of the shoulder,	40	40
Maximum longitudinal slope,	40	40
The shortest distance visibility, m		
a) for stop	300	300
b) oncoming car	-	-
Minimum curve radius:		
a) in plan, m	800	1 200
b) in longitudinal profile:		
- convex, m	15 000	30 000
- concave, m	5 000	15 000
Slope steepness at embankment slope height up to 3.0 m	1:4.0	1:4.0

Table 2: Category 2 Road Standards

Description of parameters	**Indicators on the SNiP 3.03-09.2006***	**Design**
The estimated traffic volume on a 20-year term, IU/day	from 6000 to 14000	8578
The estimated speed of movement, km/h	120	120
The number of lanes, PCs	2	2
Lane width, m	3.75	3.75
The width of the roadway, m	7.5	7.5
Shoulder width, m	3.75	3.75
The smallest width of reinforced strip of roadside, m	0.75	0.75
Width of roadbed, m	15.0	15.0
Crossfall of the carriageway and fortified zone, ‰	20	20
Shoulder slope, ‰	40	40
The greatest longitudinal gradient ‰	40	32
The lowest visibility distance, m		
a) to stop	250	250
b) oncoming car	450	450
The minimum radii of curves		
a) in plan, m	800	1200
b) in the longitudinal profile:		
- convex, m	15000	15015
- concave, m	5000	13112
Turns with a planar profile of the roadway when the radii of curves in plan, m	2000	2000

B.4.2 Cross Sections

129. The following figures provide drawings of the typical road cross sections for Category 1-b and Category 2 roads. Figure 4 illustrates a typical Category 1-b road cross-section of the road which would be used on most of the alignment through rural areas. Figure 8 illustrates the Category 1-b cross section in towns, specifically Bestamak. The cross section clearly shows that street lighting will be provided in this area along with the positions of the proposed noise barriers. Also note the provision for slip roads on either side of the main pavement.

B.4.3 Pavement

130. The entire existing roadway is asphalt concrete. The current thickness of the pavement is from 2 to 12 cm. The width of the roadway varies from 5,7 to 9.6 m. The existing pavement is in unsatisfactory condition, often in very poor condition. There are potholes, breaks, chipping, numerous cracks and chips. Traces of pothole repairs are visible in some places. The destruction of the available pavement is from 10 to 70%. Shoulders are low and not fortified, in some places overgrown with grass.

Figure 5: Pavement Rutting, Approximately KM 80

131. Based on the results of comparison of the variants of the pavement design by the Client and the design team the pavement design adopted for the Project is as follows:

- Wearing coarse from SMA-20 on bitumen BND - 70/100, thickness H=5 cm. E=3600 MPa.
- Bituminous binder coarse from hot porous coarse-grained asphalt-concrete mixture of grade I in bitumen BND - 70/100, thickness H=10 cm. E=2200 MPa.
- Bituminous base coarse from hot porous coarse-grained asphalt-concrete mixture on bitumen BND - 100/130 of grade II thickness H=12cm. E=1400 MPa.
- Crushed stone base coarse C-4 according to GOST 25607, thickness H=18 cm. E=270 MPa.
- Soil of subgrade-heavy loam, dusty 25% GSM +4% of cement M-300+enzyme preparation 0,0303l/1m3 H=0.20m. E=250 MPa.
- Soil of the subgrade – loam heavy and sandy. E=50 MPa.
- Total thickness of the structure 65 cm.

- Tack coat and prime coat are provided for better adhesion pavement, by pouring bitumen emulsion on the base coarse and binder coarse at a rate of 0,7 and 0,3 l/m2, respectively.

Figure 6: Cracked Pavement, Bestamak

B.4.4 Junctions, Intersections and Interchanges [1]

132. 20 junctions are included in the design, as well as three intersections with traffic light regulation. The location of the junctions and interchanges can be seen in **Appendix A** plans. The joining of the edges of the carriageways of the main and adjoining roads is performed by transitional and circular curves. Intersections and junctions are designed taking into account the recommendations of the standard project 503-0-51.89 “Intersections and junction of roads in one level" for roads of I-b category with median, the number of junctions is taken according to the norms of SNiP.

133. Three intersections are planned under the Project as follows:

- Interchange in two levels near the town of Alga (the start of bypass, KM35) - The Interchange in two levels was designed at the beginning of the bypass of the Alga city. A two-level interchange designed a pipe with an additional turn towards Aktobe using the existing road to the Alga city as a right-turn ramp.
- Interchange in two levels near the town of Alga (the end of bypass, KM49) - The interchange in two levels was designed at the junction of the existing road exit from the Alga city towards the Atyrau. The interchange in two levels is designed by type - a pipe with an additional turn in the direction of Kandyagash, using the existing road to the Alga city as a right-turning ramp.
- Interchange in two levels near the Kandyagash town (beginning of bypass, KM 84+805 – the interchange is designed by type – a pipe with an additional turn towards Aktobe using the existing road to the Kandyagash city as a right-turn ramp.

[1] An **intersection** describes a situation where two or more roads cross at the same level.
An **interchange** is a grade-separated **intersection** (one road passes over another) with ramps to connect them.

Figure 7: Typical Cross Section (Category 1-b)

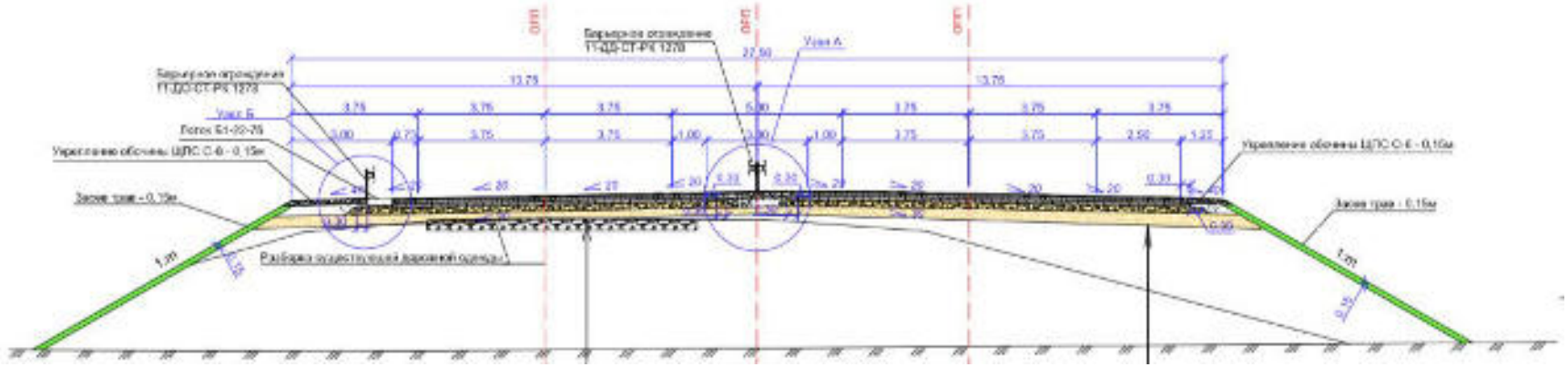
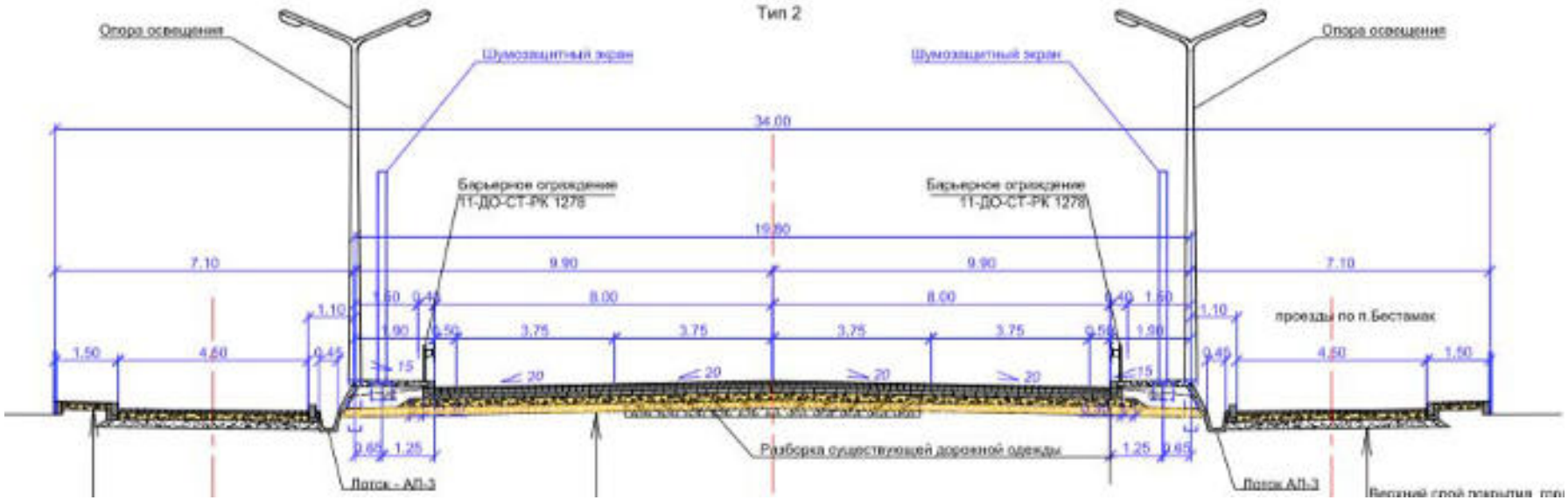


Figure 8: Cross Section in Towns (Category 1-b)



134. In addition to the main lanes of the carriageway of the main road, for interchanges there are combined acceleration and deceleration lanes allowing smooth entry or exit to ramps, eliminating interference to direct traffic, improving traffic management and improving safety. The length of combined acceleration and deceleration lanes for right-turn traffic ramps is assigned according to the requirements of SNiP RK 3.03-09-2006, based on the main road and longitudinal slope for design speed of 120 km/h. The superelevations on the right and left turning ramps are taken with a slope of 40%.

135. The locations of the interchanges are shown in plans provided in **Appendix A**.

B.4.5 Bridges, Overpasses, Underpasses and Road Crossings

136. Nine bridges are foreseen as part of the Project. All bridges are designed in accordance with SNiP 2.05.04-84 (Bridges and culverts).

Table 3: Bridges

#	Chainage	Name of Watercourse	Length (m)
1	14.9	None (Inlet of Reservoir)	12.60
2	18.0	Kumsai river	48.7
3	24.2	Tamdinka river	51.70
4	30.2	Batpackty river	21.6
5	38.5	Ilek river	150.8
5	48.7	Ilek river	150.8
6	55,1	Talasbai river	45.7
7	67.7	Batpackty river	63.7
8	70.4	River Talasbai	45.7
9	82.4	River Tabantal	42.7

137. Four overpasses are planned as follows:

Table 4: Overpasses

#	Chainage	Village	Length (m)
1	KM 5.60	Mugalzhar district	83
2	Overpass at the Interchange near the town of Alga (the start of bypass)	Alga	66
3	Overpass at the Interchange near the town of Alga (the end of bypass)	Alga	66
4	KM84	Overpass at the railway, Alga	66

138. Two underpasses have been designed for the movement of cattle as shown in the table below. In addition a further two culverts have been designed to allow the passage of cattle.

Table 5: Agricultural Underpasses

#	Chainage	Area	Length (m)
1	KM27	Bestamak	12
2	KM29	Bestamak	12
3	KM74	Mugalzhar district	8.5
4	KM78	Mugalzhar district	8.5

139. Three traffic light controlled crossings are designed in the beginning, middle and end of the Bestamak village. The distance between first and second light will be 650 m, between second and third one – 350 meter.

B.4.6 Drainage

140. According to a survey of artificial structures as part of the detailed design, culverts are in poor condition. The number of defects for all pipes, is the insufficiency of backfill over the pipe, which should be 0.5 m (SNiP 2.05.03-84*) and the lack of slope protection, which in particular leads to the destruction of the embankment and its erosion at the inlet and outlet tubes.

141. In addition, the existing culverts are not designed for the anticipated new loads and regulatory requirements for the 1st category road, therefore all pipes are to be disassembled. The Project requires the installation of 50 culverts, including:

- d = 1.5 м – 17 units
- d = 2 x 1.5 м 10 units
- d = 3 x 1.5 м - 9 units
- d = 2.0 x 2.0 м – 2 units
- d = 2.0 x2.5 м – 5 units
- d = 4 x 2.5 м – 8 units

142. The 4 x 2.5m culverts will also be used as cattle underpasses.

143. At KM21+680, KM34+289 and in the area the entrance to Kandyagash soils are aggressive to Portland cement concrete. As such the use of sulphate resistant cements in these areas is required.

B.4.7 Fencing

144. To prevent animals on the carriageway of the road the Project provides a mesh fencing on both sides of the road.

B.4.8 Rest Areas

145. The Project provides eight rest areas. The following equipment is provided at all rest areas:

- Shelter shed for passengers' rest.
- Trestle for inspection of vehicles.
- Installation of containers for garbage, trash bins.
- Construction of toilets and pedestrian walkway to them.

B.4.9 Bus Stops

146. The Project provides 18 bus stops with pavilions which are designed to shelter people from wind, rain and sun while waiting for public transport. Bus stops and rest areas are provided in accordance with standard solutions 503-05-8.84 "Bus stops and parking areas and their equipment".

B.4.10 U-turns

147. The project provides for construction of U-turns, necessary for turning the vehicles in the opposite direction. 14 U-turns are designed, 8 of them are directed towards the Atyrau and 6 are directed towards the Aktobe.

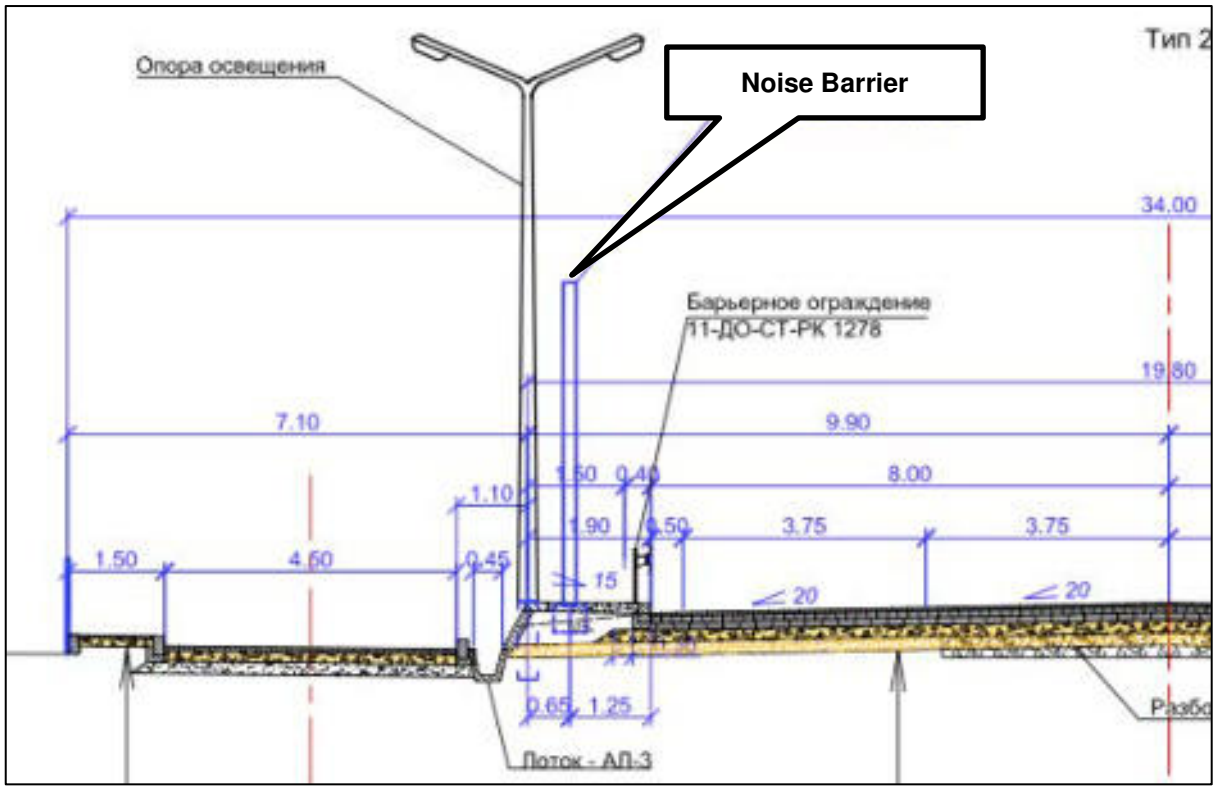
B.4.11 Traffic Safety and Road Furniture

148. The project provides for technical means of safety according to item 10.10 of SNiP RK 3.03-09-2006* and ST RK 1412-2010. The existing elements of the road furniture (road signs, signal posts and guardrails) will be dismantled and new road furniture will be installed according to the design requirements for Category 1-b and 2 roads.

B.4.12 Noise Barriers

149. The Project design includes noise barriers in Bestamak. Calculations of predicted noise levels by the designers require that the barriers be approximately three meters high.

Figure 9: Noise Barrier, Bestamak



B.4.13 Road Operational and maintenance Units

150. **Road Operational Unit – ROU-11 in Aktobe -** The ROU-11 site is located in the southern part of Aktobe. The following buildings and structures will be designed and constructed:

- Administrative building (one-storey building without a basement; rectangular in plan with longitudinal bearing walls. Floor height - 2.5m Dimensions in axes 23.18 × 12.14)
- Mechanical repair workshop;
- Material and technical warehouse(one-storey building, rectangular configuration in plan with dimensions in axes 18.0 × 9.0m. The height of the rooms is 4.1 m. The total area of storage sites is 87.75 m²);
- Canopy for storage of materials;
- Canopy for equipment;
- Boiler room;
- Checkpoint;
- Heating point (1-storey building, rectangular configuration in plan with dimensions in axes 19.2 × 11.2m. The height of the premises is -2.5 m);
- Warm parking;
- Drainage facilities (underground, overall dimensions: ø1600mm, L = 5400mm. Combined

sand-oil trap brand KPN-4, made of reinforced fiberglass, performance from 4l / sec. Overall dimensions: ø1600mm, L = 5400mm. Complete with technical wells ø1000mm (2 pcs). The depth of the inlet manifold is not more than 2.5 m); and

- Inspection overpass.

151. The access to ROU-11 is provided from the side of the bypass road with asphalt concrete pavement passing by the Novo-Aldzhansky flour mill. The technical parameters of the ROU-11 are listed in the table below.

Table 6: ROU-11 Technical Parameters

№	Parameters	Unit	Quantity
1.	Land area	ha	2,0
2.	Built-up area	м²	3530,58
3.	Asphalt concrete pavement area	м²	12120,0
	Cobblestone area	м²	781,0
4.	Green area	м²	5338,0
5.	Building density	%	17,65
6.	Greenery density	%	27,9

152. The access road will be constructed for access to ROU-11. The length of the access road is 126.66 m.

153. The scheme and location of the ROU-11 are shown in **Appendix L**.

154. **Road Maintenance Unit (RMU) in Kandyagash city -** The site for the construction of the RMU is located at KM98 of the Project road. Kandyagash is located 1.5 km from the site of RMU. The area of the site is 3681.18 m^2. Time for construction – 18 months. The RMU will have the same type of buildings and facilities as ROU in Aktobe.

155. The location of the RMU is also shown in **Appendix L**.

B.5 Scope of Works

B.5.1 Project Phases

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

1. **Feasibility** / **Design Phase** - A team of national consultants has prepared a design for the Project Road, as well as the Bidding Documents. The IEE EMP will be provided to the prospective Contractors with the Bidding Documents but are not Contract Documents. They are provided to the prospective Contractors only for initial information and understanding of the context of the project.
2. **Construction Phase** – During this phase the following activities will be undertaken:
   - **Land Acquisition -** Under the terms of the Grant of the ADB, before the commencement of the construction works at any part of the site, the *Employer* must prepare the Land Acquisition and Resettlement Plan (the LARP), obtain the approval of ADB and then implement the plan and acquire the land.
   - **Specific Environmental Management Plan (SEMP)** - Ensure that the Site Specific EMP is submitted to the Engineer for review at least 10 days before taking possession of any work site. No access to the site will be allowed until the SSEMP is reviewed by the Engineer and approved by the Project Management Consultant.
   - **Site Clearing Works -** The Works include the following site clearing works within or adjacent to the RoW of the Project Road, in accordance with the Drawings or instructions of the Engineer:
     - Clearing and grubbing.
     - Removal and disposal of traffic signs, sign posts and their foundations.

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

- **Relocation of Existing Services -** The Works include the relocation of all services affecting the construction of the Project Road within the Right-of-Way. The services include the following
  - water mains
  - overhead electric supply lines
  - gas pipelines
  - underground telephone cables
  - sewer mains
- **Construction Activities** – The main construction phase aspects are described in detail below.

3. **Operational Phase** – Commences from the date of Taking Over of the Works by the Employer.

B.5.2 Bridges

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

(i) Foundations.
(ii) Substructure including bridge bearings.
(iii) Superstructure, including construction of expansion and deformation joints and footpaths.
(iv) Deck pavement including hydro isolation, drainage, hand railing, and conduits for services.
(v) Approach slabs.
(vi) Slope treatments in front and around the abutments.
(vii) Construction and maintenance of traffic detours.
(viii) Scour and erosion protection of the waterway areas and river bank protection upstream and downstream of the bridge crossing, and removal of old foundations and substructure from the waterways.
(ix) All necessary and incidental items required for a complete bridge.
(x) All new and widened bridges will be designed for the life expectancy of 100 years.

B.5.3 Culverts

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

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

B.5.4 Other Drainage Structures

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

B.5.5 Earthworks

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

1. Removal of topsoil.
2. Construction of embankments.
3. Construction of subgrade.
4. Excavation and removal of the existing pavement materials and the existing road embankment.
5. Removal and replacement of unsuitable materials.
6. Structural excavation.
7. Excavation for the construction of side drainage and cross-drainage works.
8. Excavation for the removal and relocation of the existing utilities.
9. All backfilling necessary for the construction of bridges, retaining walls or other earth retaining structures, cross drainage structures and associated works, side drains and erosion protection work.
10. Preparation of beddings and filters for all structural, cross drainage, side drains or pavement works.
11. Excavation, filling or backfilling necessary for the execution of any other incidental works.

B.5.6 Repairing the Existing Road

160. Within the framework of the Project the existing road in Alga and 2.3 km of the existing road to Kandyagash will be repaired. The works will include stripping the existing layer of asphalt and relaying a new layer. No road widening or changes to alignment will occur in these sections, only repairing the existing pavement.

B.5.7 Construction Equipment

161. Table 7 provides indicative lists of the key equipment required in the construction phase (not including tunneling equipment).

Table 7: Key Equipment

No.	Equipment Type and Characteristics	Minimum Number required
1	Bulldozer (>245HP)	4
2	Excavator (>100HP)	12
3	Crushing and screening plant – mobile type at least 150 m3/h including rock material washing machinery	2
6	Front Loader (>135HP)	15
7	Concrete batching plant (>150m3/hr)	2
8	Motor grader (>135HP)	10

9	Vibratory roller (> 13T)	8
10	Tipper truck (10T)	30
11	Tipper truck (16T)	30
12	Mobile concrete carriers (>25T)	25
13	Transit mixer (>6m3)	6
14	Crane (100 tons)	4
15	Crane (250 tons)	2
16	Rotary drilling Machine	8
17	Roadheader	2
18	Excavator Hammer	8
19	Jack Hammer	8
20	Pusher Leg	4
21	Truck mixer concrete pump	10

B.5.8 Personnel

162. The construction phase will last approximately 31 months for Km11-52 and 33 months for km52-100 and it is expected that approximately 300 direct employment opportunities will be available during the peak of construction. This will be divided between two construction 'Lots'. The breakdown of skills required during the construction phase will be as follows:

(i) Skilled labour: 58%;
(ii) Semi-skilled labour: 20%; and
(iii) Unskilled labour: 22%.

B.6 Source of Materials and Construction Facilities

B.6.1 Borrow Pits and Quarries

109. The exploitation of borrow pits and quarries will be conducted by licensed companies or the Contractor will obtain its own licenses. The exact locations of quarry and borrow sites will be determined by the Contractor and specified within the SEMP. The Project will not implement any exploration activities from illegal sources. Table 8 indicates the potentially available sources.

Table 8: Potential Borrow Locations

#	Location / Name	Material
1	KM 27+861 - Borrow pit 1 for KM11-52 section	Loamy sand
2	KM45 – Borrow pit 2 for KM11-52 section	Loamy soil
3	KM 52 -Borrow pit 3 for KM11-52 section	Loamy soil
4	KM 55+800 – Borrow pit 1 for KM52-100	Loamy soil
5	KM 68+850 – Borrow pit 2 for KM52-100	Loamy soil
6	KM 78 – Borrow pit 3 for KM52-100	Loamy soil
7	KM 93+800 – Borrow pit for KM 52-100	Loamy soil

B.6.2 Asphalt and Concrete Batching

163. The Contractor will be responsible for ensuring all concrete batching facilities and asphalt plant comply with the conditions outlined in this IEE and that all necessary permits to operate are obtained from the relevant regulatory authorities. **Section F.8.4** provides explicit conditions for operating batching plants and asphalt plants and the conditions for sourcing concrete and asphalt from existing plants.

B.6.3 Technical and Potable Water

164. Approximately 200 m^3 of technical water will be needed per day during the construction phase and around 15 m^3 of potable water per day. Technical water supply will be provided from the Aktyubinskoe water storage reservoir and the Ilek river, drinking water supply is planned from the settlements of Bestamak and Alga. The quality of tap water should comply with GOST 2761-84.. The final locations of the extraction points (for both technical and potable water) will require the approval of the Engineer, KazAvtojol, Territorial Environment Protection Offices (TEPOs) and the Committee on Water Resources prior to the start of extraction to ensure that over extraction of water resources does not happen. Potable water will also need to be tested regularly throughout the construction period to ensure it meets the drinking water standards of GoK.

B.6.4 Camps and Storage Areas

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

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

167. The Contractor will provide the following basic facilities in the construction camps:

- Safe and reliable water supply.
- Hygienic sanitary facilities and sewerage system.
- Treatment facilities for sewerage of toilet and domestic wastes
- Storm water drainage facilities.
- Sick bay and first aid facilities.

168. Detailed criteria for siting of construction camps and establishment of facilities are given in **Section F.8.4 - Construction Camps, Asphalt Plants, Batching Plants & Temporary Storage Sites** and the Project EMP – **Section G**.

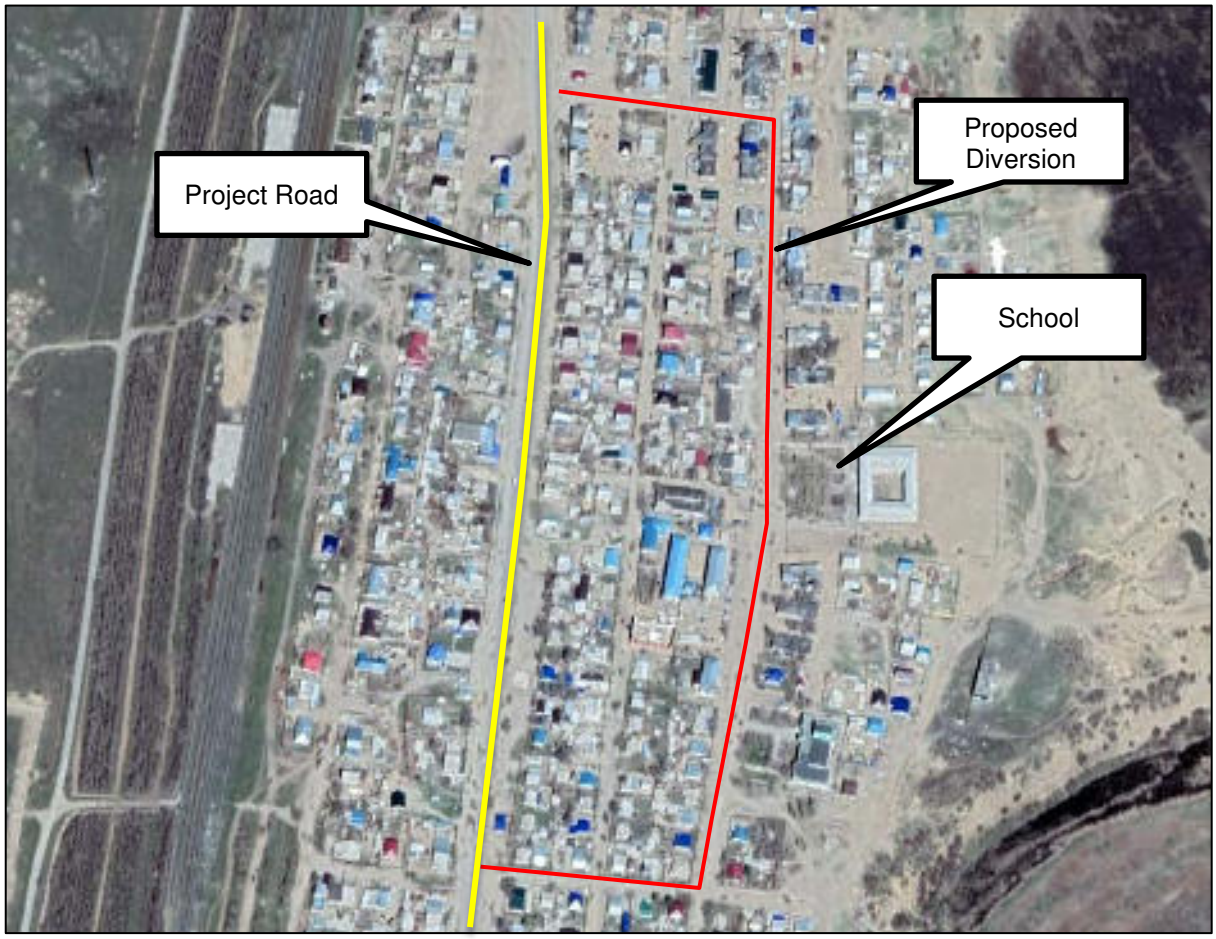
169. **Storage Areas -** Temporary storage areas will be required for certain activities, such as the storage of sand and gravels and construction equipment. These storage areas may range in size from anything between 50 m^2 to more than a hectare. The precise locations of these temporary facilities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

B.6.5 Diversions

170. During the construction of the road through Bestamak a diversion from the main road will be required. KazAvtojol have indicated that there is a potential bypass as shown in the figure below. However, this diversion runs next to an existing school and as such it is not recommended that this diversion route be used as it would increase the potential risk of

accidents as school children cross back and forth across the road at the start and end of the school day.

Figure 10: Proposed Diversion, Bestamak



C. Alternatives

C.1 General

171. One of the objectives of an IEE is to investigate alternatives to the Project. In relation to a proposed activity "alternatives" means different ways of meeting the general purposes and requirements of the proposed activity. The following section provides an assessment of alternative corridors, alignments, transport modes and technologies, as well as the 'no action' alternative.

C.2 The No Action Alternative

172. The "No Action" Alternative in this instance is defined as a decision not to undertake the proposed construction of the Project Road. The "No Action" Alternative would result in the continued deterioration of the road, bridges and drainage structures along the RoW, thereby impeding the economic development of the Project Area and the Aktobe region. All positive benefits would be foregone. The relatively minor, short term, less than significant environmental impacts associated with road rehabilitation (such as noise and air quality impacts) and inconveniences (such as traffic diversions) would be avoided in the short-run. In the long run, however, the steadily declining state of the roadway would severely hamper economic development in the area. In addition, the poor condition of the existing road represents a safety hazard to road users and continuing to use the road in its current condition will undoubtedly result in an increased number of accidents on the road.

173. In light of these considerations, the "No Action" Alternative is deemed to be neither prudent nor in the best interest of the local population and Kazakhstan as a whole or those with an interest in, and attempting to assist restoration of, Kazakhstan's well-being.

C.3 Alternative Road Corridors

174. There are no other alternative road corridors to explore or assess under this Project as the aim is to rehabilitate this portion of the A-27 linking Kandyagash with Aktobe.

C.4 Alternative Alignments

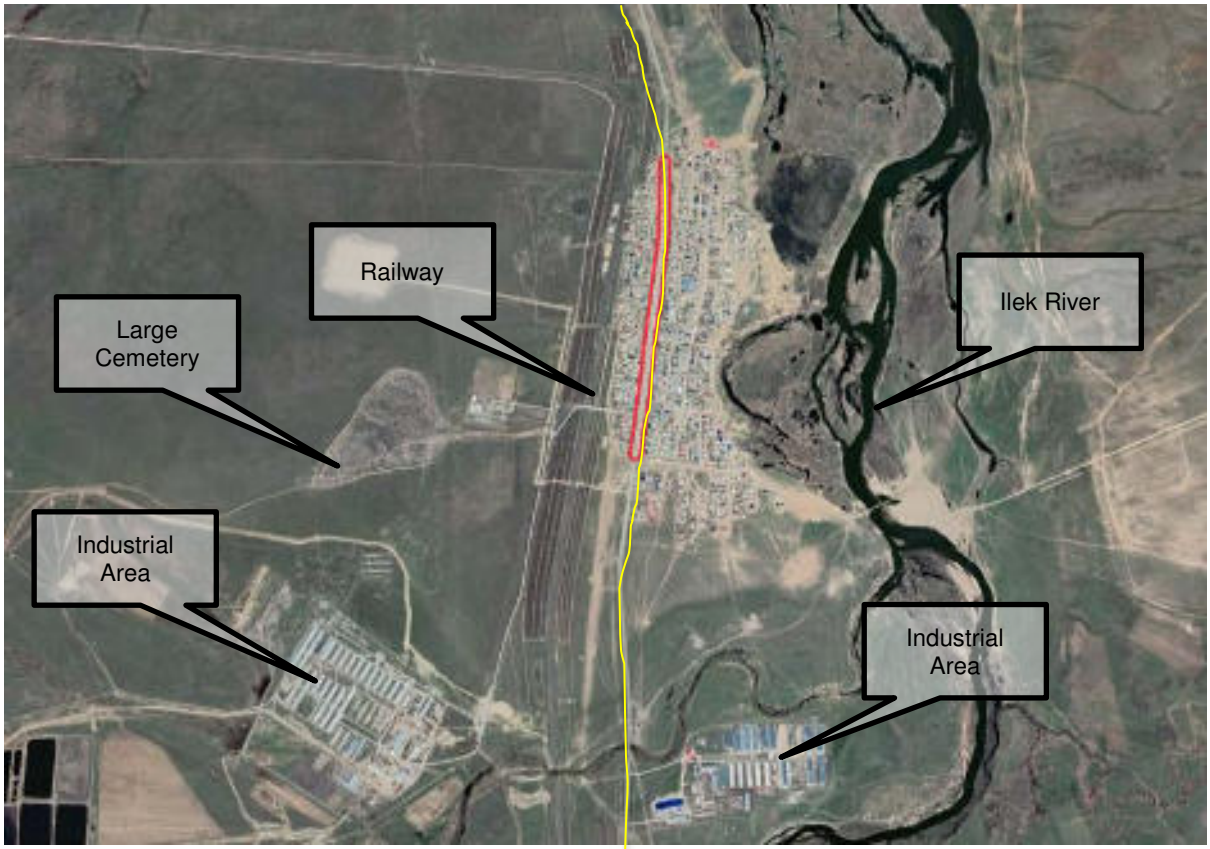
175. As noted in **Section B**, the Project includes two bypasses around the towns of Alga and Kandyagash. The alternative to these bypasses is to continue to use the existing road which passes through the center of each town.

176. In the case of Alga this would result in a number of resettlement and compensation cases. Impacts from increased levels of noise during the operational phase would also mean that noise barriers would almost definitely be required through the whole village. The town would be bisected by the highway leading to access issues, unless an appropriate number of underpasses or overpasses were constructed. In addition the road would need to cross the existing railway which would require a large overpass in the center of the town which would have significant visual impacts. Currently traffic is often backed up in the center of the town as the rail crossing is closed to let rail traffic pass through the town. This results in idling engines as cars queue along the existing road in what is essentially a residential area. The option of bypassing Alga to the west is not considered prudent due to the proximity of the existing chemical plant in this area.

177. In the case of Kandyagash the bypass similar impacts will be avoided compared with upgrading of the existing alignment, e.g. resettlement and compensation, noise and access. In addition, the bypass allows for the future growth of the city without impacts from the highway.

178. The possibility of bypassing Bestamak has been ruled out due to the fact that there is no suitable alignment option to the east or west of the town. Figure 11 illustrates these constraints including the Ilek river and an industrial area to the east and a railway line, cemetery and industrial area to the west.

Figure 11: Bestamak Alignment Constraints



C.5 Alternative Transport Modes

179. The road corridor runs alongside an existing rail line, which connects Aktobe with Kandyagash and on to Aktau and other areas of Kazakhstan. This railway, although mostly single track, is capable of handling large freight and passenger trains, and is being further upgraded. However, the railway is considered necessary as part of a mix of transport modes, with rail promoted as the preferred mode for longer distance, containerized and bulk commodities, as this represents the most environmental and efficient mode of transport. On the other hand, the Project road is promoted for the local and regional movement of people and goods. Accordingly, the railway is not considered an alternative to the Project but as an additional component of the country wide transport network.

C.6 Alternative Construction Camps and Laydown Areas.

180. The locations of these facilities is not currently known. The Contractor will choose the sites which will need to follow the guidelines for siting and management as outlined in this IEE (**Section F.8.4 - Construction Camps, Asphalt Plants, Batching Plants & Temporary Storage Sites**)

D. Environmental Laws, Standards and Regulations

D.1 General

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

D.2 Country Policies and Administrative Framework

D.2.1 Overall legal framework

182. Environmental protection is administered in Kazakhstan by the Ministry of Energy of the GoK. This Ministry has been formed during reorganization of the GoK in August 2014. The ministry has taken functions and responsibilities of liquidated Ministry of Oil and Gas of the GoK, Ministry of Industry and New Technologies and the Ministry of Environmental Protection and Water Resources.

183. The overarching legislative framework that establishes the legal framework for environmental protection in Kazakhstan is the Kazakhstan Environmental Code (also translated as the Ecological Code), Law Number 212-III, adopted 9 January 2007 with latest amendments and additions dd June 15, 2015 (referred to hereafter as the 2007 EC)[2]. Three main laws (the *Law on Environmental Protection*, the *Law on Ecological Expertise* and the *Law on Air Protection*) were abrogated subsequent to their integration into the Environmental Code. Moreover, some 80 normative legal acts were abrogated after the adoption of the Environmental Code.

D.2.2 Environmental Impact Assessment (OVOS)

184. According to Article 36 of the Environmental Code development of OVOS (or EIA) is mandatory for all types of activities and projects that can have a direct or indirect impact on the environment or health of the people. The permitting system is a component of the Environmental Code.

185. The Ordinance №204-п of the Ministry of Environmental Protection of GoK (June 28, 2007 with amendments and additions 24 September 2013) on “Approval of the instruction on conducting environmental impact assessment of planned economic activity when developing pre-planning, planning, initial project and project documentation” establishes the basis for OVOS and represents the main guiding document on the OVOS process in Kazakhstan.

186. The OVOS consists of four (4) stages:

(i) ***Review of environmental conditions***: It includes general characteristics of natural and socio-economic environment of the area of planned activity, analysis of main trends of practical use of the territory and defining of principal positions of OVOS. This stage of the OVOS is based on the conceptual design, available materials, other special literature, project description etc. The purpose of this stage is to evaluate the environmental conditions, identify key environmental issues, choose the best option available for siting of the development, and to define scope of work for the second stage

[2] Source: http://online.zakon.kz/Document/?doc_id=30085593#pos=1;11

(ii) ***Preliminary environmental assessment (PEIA or predOVOS)***: it is essentially a scoping-level desk study prepared in parallel with an engineering feasibility study;
(iii) **OVOS:** it is a comprehensive assessment of positive and negative environmental impacts along with a detailed mitigation & monitoring plan; and
(iv) **Section "Environment Protection"**. It is required only if certain technical solutions in the feasibility study undergo substantial revisions after the OVOS has been completed and approved.[3] In this case, the Section "Environment Protection" represents an updated OVOS of the second stage with a detailed assessment of additional technical solutions.

187. A "Notification of environmental consequences" is prepared by the project proponent as an annex to the OVOS and is submitted for the ecological expertise along with other project documentation. The notification is mandatory at all stages of OVOS.

188. Other legislation addressing specific environmental issues has also been enacted. The Forest Code regulates the use, protection and conservation of forests as well as forest restoration. Specific issues related to the protection and conservation of forests, are regulated in by-laws. The Water Code passed in July 2003 contains main directives on environmental protection, preservation and use of water resources on the territory of Kazakhstan. The last changes were integrated in February 12, 2009. The main state document regulating land use and protection is the Land Code of the Republic of Kazakhstan that was adopted in June 20, 2003 (№-442-II) with changes and amendments as of July 4, 2013.

D.2.3 Administrative Framework

189. The central executive body for environmental protection in the Kazakhstan Administrative Framework is the Ministry of Energy (MoE). MoE's responsibilities include developing and pursuing national environmental policy, enforcing laws, and administering State supervision and State ecological expertise. MoE oversees the country's compliance with ratified international environmental conventions and inter- State environmental agreements. It also controls emissions and discharges of pollutants, issues permits of certain categories (discussed below) and determines the maximum volumes and composition of pollutants.

190. At the local level, the MoE has territorial environmental protection offices (TEPOs). Their role is mostly related to inspection of local sites, but they also play an advisory role regarding enterprises and perform State ecological expertise on subjects of local importance. Akimats (the executive branch of local government) and maslikhats (representative local authorities) are entitled to perform State supervision and can approve certain provisions and tariffs for use of natural resources. They also determine, within certain limits, the pollution charges paid by enterprises. They allocate natural resources, including mountain and woodland pastures and grasslands, and establish and administer local specially protected areas, and also issue nature resource-use regulations within their competencies.

191. The other State bodies within the Kazakhstan Administrative Framework with relevant environmental responsibilities are as follows:

- The Committee on Forestry and Wildlife (CFW) within the Ministry of Agriculture (MoA) manages woodlands and specially protected natural areas: nine national natural reserves and six national natural parks in the 14 oblasts. At the local level, territorial offices of the Committee manage forestry and bio-resources, and 138 governmental Forest Conservation Agencies (accountable to the Committee) are responsible for forest protection and conservation.

- The Committee on Water Resources (CWR) under MoA administers the State reporting system regarding the protection and efficient use of water resources. Its responsibility

[3] Point 27 of the Ordinance №204-п dated 28 June 2007

covers: water intake from natural watercourses and groundwater; fresh water consumption; water use for production; water use for agriculture; conservation of fresh water and the recycling of water supply; and sewage discharges into natural water bodies and underground. Water resources are managed by the river basin organizations according to hydrographic or river basin principles.

- The Emergency Management Committee of the Ministry of Internal Affairs is responsible for environmental disaster management and prevention (e.g., fires, flooding, mudslides, industrial accidents, etc.).

D.3 Other Legislation, Standards and Regulations

D.3.1 Air Quality

192. The regulatory document containing information on harmful substances in the atmospheric air is the "Sanitary and Epidemiological requirements for the Atmospheric Air Quality" approved by the Order of the Ministry of Health of the GoK (№629, 18.08.2014)

193. The emission of hazardous substances (pollutants) in the atmospheric air by the stationary source is allowed only on the basis of a special permit issued by the authorized state body in charge of atmospheric air protection or its territorial subdivisions. The fee is based on the total annual emissions of the polluter without disaggregating data by emission sources. The issuing of air pollution permits for stationary and mobile sources of emissions (ground and air transport) is stipulated in the Environmental and Tax Codes of the Republic of Kazakhstan.

194. All motor vehicles of any type (including buses and trucks) are required to pass an annual roadworthy test which includes emission testing which must be in accordance with the regulations referred to below.

Table 9: Air quality legislation

Instruction on Agreement and Approval of the Design of the Maximum Permissible Emission (MPE) and Maximum Permissible Discharges (MPD)	The Order of the Ministry for Environmental Protection of the GoK No.61n dd24.01.2004
Collected Book of Methods for Calculation of the Atmospheric Air Pollution by Different Types of Production	The Order of the Ministry of Ecology and Bio resources 01.12.96. *Included in the list of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry for Environmental Protection No 324-n dd October 27, 2006*
The Inventory rules for Emissions of the Hazardous substances (pollutants), harmful Physical Effects on the Atmospheric Air and Their Sources	The Order of the Ministry for Environmental Protection of the GoK No.217-n dd. August 4,2005
The procedure of Calculation of the Hazardous Substances Concentrations Containing in the Atmospheric Discharges of Industrial Enterprises. Guiding normative document 211.2.01.01-97	The Order of the Ministry of Ecology and Bioresources, 01.08.1997. *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry for Environmental Protection No 324-n, October 27, 2006*
The procedure of Calculation of the Hazardous Substances Concentrations Containing in the Atmospheric Discharges of the Enterprises	Approved by the Order of Minister of Environmental Protection No.100-n, April 18,2008
Recommendations on Execution and Content of the Design Standards of the Maximum Permissible Emissions (MPE) in the	The Orders of the Minister of Ecology and Bio resources dd August 1, 1997 and Order of the Ministry of Natural Resources and

Atmospheric Air made by the Enterprises of the Republic of Kazakhstan. Guiding normative document 211.02.02-97	Environmental Protection of the GoK No. 156, 06.07.2001 *Included the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry for Environmental Protection No.324-n dd October 27, 2006*
Instruction on Standardization of the Air Pollutants Emissions in the Republic of Kazakhstan	The Order of the Ministry of Natural Resources and Environmental Protection of the GoK No.516-n, 21.12.0 *Included the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry for Environmental Protection No.324-n dd October 27, 2006*
Calculation of Motor Vehicles Emissions Guiding normative document 211.2.02.07-2004	The Order of the Ministry for Environmental Protection of the GoK No.324-n, October 27, 2006 *Included in the List of current regulatory legal acts in the field of the environmental protection, the Order of the Ministry for Environmental Protection No.324-n, October 27, 2006*
Calculation of Specific Emissions of Atmospheric Pollutants and Associated Damages based on Type of Used Fuel in the Republic of Kazakhstan Guiding Normative Document 211.3.02.01-97	The Order of the Ministry for Ecology and Bioresources 09.07.1997. *Included in the List of current regulatory legal acts in the field of environmental protection, the Order of the Ministry for Environmental Protection No.324-n, October 27, 2006*
Calculation of Contaminants in the Exhaust Emissions from Transport enterprises	Approved by the Order of the Minister of Environmental Protection No.100-n, April 18, 2008
Rules of Government Accounting of Sources of Greenhouse Gases Emissions into the Atmosphere and Consumption of Ozone-destroying Substances	The Governmental Decree No 124, February 8, 2008
Rules for Limiting, Stopping or Decreasing Greenhouse Gases Emissions into Atmosphere	The Governmental Decree No.128, February 11,2008

195. The Environmental Code defines the basic terms and principles of State control of air and soil conditions. In addition Sanitary Regulations and Standards (referred to as "SanPiN") exist with the aim of protection of human health.

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

197. The standards for air quality establish the permissible limit of the content of harmful substances both in industrial areas and residential areas. The main terms and definitions related with the atmospheric air contamination, monitoring programs, behavior of pollutants in the atmospheric air determined by the GOST 17.2.1.03-84; Environmental Protection, Atmospheric Air Terms and Definitions for Contamination Control.

Table 10: Air quality standards in Kazakhstan [4]

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

198. International standards for the amount of contaminants of concern in air that people may breathe have been established by the World Health Organization (WHO) and by the EU. Table 11 provides these standards.

Table 11: WHO / EU Ambient Air Quality Standards

Parameter	WHO Guideline Value - µg/m^3	EU Standard - µg/m^3
Particulate Matter - PM_{10}	Annual Average - 20	Annual Average - 40
	24-hour Average - 50	24-hour Average - 50
Particulate Matter – $PM_{2.5}$	Annual Average - 10	Annual Average - 25
	24-hour Average - 25	-
Nitrogen dioxide (NO_2)	Annual Average - 40	Annual Average - 40
	1-hour Average - 200	1-hour Average - 200
Sulfur dioxide (SO_2)	24-hour Average - 20	24-hour Average - 125
	1-hour Average - 350	1-hour Average - 350
Lead (Pb)	-	Annual Average – 0.5

D.3.2 Water Quality

199. The main legislative act in the area of water resources protection and use is the Water Code of the Republic of Kazakhstan №481, 09.07.2003. According to the definition provided in this document, protection of water bodies is an activity aimed at conservation, rehabilitation and reproduction of water bodies as well as prevention of water from detrimental effect.

200. According to Article 112, water bodies shall be protected from: (i) natural and industrial pollution of hazardous chemical and toxic substances and their compounds, as well as thermal, bacterial, radiation and other types of pollution; (ii) infestation and pollution with hard, non-soluble subjects, industrial, household and other types of wastes; (iii) fecal pollution.

201. Water bodies shall be protected to prevent: (i) disturbance of the environmental stability of the natural systems; (ii) causing harm to the lives and health of population; (iii) reduction of fishery resources and other water fauna; (iv) deterioration of the water supply conditions; (v) weakening of the natural self-reproduction and cleansing functions of the water bodies; (vi) other unfavorable conditions that negatively affect physical, chemical and biological qualities of water bodies.

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

202. Protection of water bodies is carried out through (i) taking into consideration competing or conflicting demands related to the protection of water bodies to all water users who use water for any purpose; (ii) improving and applying water protective activities/ measures with the help of new equipment and environmentally and epidemiologically safe technologies; (iii) establishment of water conservation zones and sanitary protection zones for protection of public (drinking) water supply sources; (iv) execution of public (state) and other forms of control over the use and protection of the water bodies; (v) applying sanctions for non-observance of the water protection requirements.

203. Central and local executive authorities of Oblasts, cities of republican importance, and the capital undertake measures in compliance with relevant legislation and principles of sustainable development to conserve water resources as well as prevent, mitigate and eliminate water pollution.

204. Physical and legal entities that discharge effluents to water bodies are obliged to develop and implement managerial, technological, forestry, ameliorative, land treatment, hydro technical, sanitary-epidemiological and other activities to ensure protection of water bodies from pollution and depletion of water resources.

205. Article 116 of the Law regulates issues related to water protection zones. In particular, the Article mandates the establishment and demarcation of water protection zones and belts to maintain water bodies and water facilities in the state required by hygiene & sanitary and ecological norms, to prevent contamination and depletion of surface waters, to preserve flora and fauna.

206. When developing a project that may have a negative impact on water resources, the project design should be agreed with a local executive entity in charge of water resources use, which is a River Basin Organization of the Water Resources Committee of the Ministry of Agriculture of RK. The Water Code, initially adopted on March 31, 1993 and then substantially revised and passed in July 2003, is the main guiding document in the Republic of Kazakhstan on water resources conservation and protection. In addition, the Government approved a State Program on Water Resources Management for 2014-2020 that—among other things—addresses issues related to the access and quality of drinking water, and needs of ecosystems.

207. Following adoption of the Water Code, the GoK has adopted by-laws that specify procedures for issuing special use permits and recall of such permits; for using water in case of firefighting needs; for classifying water ways as navigable routes; and for using reservoirs for air transport needs. The Government of RK approved a list of reservoirs (including underground waters) of health significance and reservoirs of special state significance or special scientific value. Granting the access to the listed water bodies is either restricted or entirely prohibited.

208. As in case with the air quality standards, various indices were used for comparative testing of water contamination. The most widely used index is the integrated hydro-chemical water impurity index (WII). The basic document regulating the quality of surface waters and hazardous substances is the sanitary and epidemiological norms and regulations for the Surface water protection against pollution №3, 02.03.2004 approved by the Order of the Ministry of Health of the GoK № 506, 28.06.2004.

209. The legislative and regulatory and procedural documents in the field of the water environment protection are listed below:

Table 12: Water quality legislation

Recommendations on Execution and Content of Design Standards of the Maximum Permissible Discharge (MPD) in Water Bodies for Enterprises in the Republic of Kazakhstan.	The Order of the Ministry of Ecology and Bioresources of the GoK, 1992. *Included in the List of the current regulatory legal acts in the field of the environmental protection,*

	the Order of the Ministry for Environmental Protection #324-n, October 27, 2006
Instruction on Discharge of Contaminants into Water Bodies of the Republic of Kazakhstan Guiding normative document 211.2.03.01-97	The Order of the Ministry of Natural Resources and Environmental Protection of the GoK#516-n, 21.12.00. *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry for Environmental Protection #324-n, October 27, 2006*
Calculation Procedure for Standards of Water Pollutants Discharges into Water Bodies, Disposal Fields and Land	Approved by the Order of the Minister of Environmental Protection #100-n, April 18, 2008
Procedure for Establishment of a Maximum Permissible Discharge (MPD) of Pollutants to Disposal Fields and Natural Land Depressions. Guiding normative document 211.3.03.03-2000	The Ministry of Environmental Protection of the GoK #156-n, 06.07.2001 *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry for Environmental Protection #324-n, October 27, 2006*
Recommendations on Control & Oversight of Operation of Treatment Facilities and Discharge of Wastewaters.	The Order of the Ministry of Ecology and Bioresources of the GoK, 21.05.94. *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry for Environmental Protection #324-n, October 27, 2006*
Rules of Surface Waters Protection in the GoK Guiding normative document 01.01.03-94	The Order of the Ministry of Ecology and Bioresources of the GoK, 27.06.94. *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry for Environmental Protection #324-n, October 27, 2006*
Guidelines on Application of the Rules of Surface Waters Protection in the GoK	The Order of the Ministry of Ecology and Bioresources of the GoK, 12.02.97. *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry for Environmental Protection*
Procedural Requirements for Application of Norms and Standards of Water Resources Use in Various Climatic Zones of the Republic of Kazakhstan during Ecological Zoning.	Approved by the Order of the Minister of Ecology and Bioresources of the GoK, 1997. *Included in the List of the current regulatory legal acts in the field of the environmental protection, the Order of the Ministry for Environmental Protection*

210. Water quality standards for Kazakhstan are presented below.

Table 13: List of Pollutants and Maximum Permissible Concentrations (MPC) Polluting the Surface Waters of the Republic of Kazakhstan[5]

Pollutant	MPC for Fishery water bodies (mg/dm^3)	MPC for the water bodies used for household drinking and utility water (mg/dm^3)	WHO Standard for Drinking Water	Hazard Class
Chrome (3+)	0.005	0.5	0.05	3
Chrome (6+)	0.02	0.05	-	3
Ferrum (total)	0.1	-	-	-
Ferrum (2+)	0.005	0.3	-	3

[5] Water Quality Standards and Norms in the Republic of Kazakhstan. The Regional Environmental Center for Central Asia. 2009

Pollutant	MPC for Fishery water bodies (mg/dm^3)	MPC for the water bodies used for household drinking and utility water (mg/dm^3)	WHO Standard for Drinking Water	Hazard Class
Ferrum (3+)	0.5	-	-	-
Zinc (2+)	0.01	1.0	-	3
Mercury (2+)	0.00001	0.0005	-	2
Cadmium	0.005	0.001	0.003	2
Arsenic	0.05	0.05	0.1	2
Copper (2+)	0.001	1.0	2.0	3
BOD_5	3 mg O_2/l	3 mg O_2/l	-	
Phenols	0.001	0.001	-	4
Oil Products	0.05	0.3	-	4
Flourides	0.05	1.5	-	2
Nitrites	0.08	3.3	-	2
Nitrates	40.0	45.0	50	3
Salt Ammonia	0.5	-	-	4
Cadmium	0.001	-	0.003	2
Sulfates	100.0	-	-	Cond 4
Magnesium	40.0	-	-	Cond 4
Manganese	0.01	-	-	3
Nickel	0.01	-	0.07	3

D.3.3 Soils

211. New sanitary rules were introduced in Kazakhstan following long-term scientific studies. As such, SanPiN (Sanitary Rules and Norms) 2.1.7.1287-03 Sanitary and Epidemiological Requirements for Quality of Soil and Subsoil establishes standards for soils quality in inhabited localities and agricultural lands, and control the observance of the sanitary-hygienic standards during engineering, construction, renewal (technical upgrading and operation of facilities for different purposes that may cause the adverse impact on soil).

212. The main terms related to the chemical contamination of soils are defined by the GOST 27593-88. The basic regulatory documents for control of the soil pollution content is "Standards of the Maximum Allowable Concentrations of the Hazardous Substances, Harmful Microorganisms and Other Biological Materials Being the Soil Pollutants" approved by the Order of the Ministry of Health of the GoK #99, 30.01.2004 and the Order of the Ministry of Environmental Protection of the GoK №21П, 27.01.2004.

213. The maximum allowable concentration (MAC) or allowable permissible concentration (APC) of chemical substances in soil refer to principal criteria for the sanitary assessment of soil contamination by chemical agents.

214. This requirement applies to all land uses and does not differentiate between various land uses. The verification of the MAC of the chemical substances in the soil is based on 4 main nuisance values identified. The Maximum Allowable Concentration for the soil valid in Kazakhstan are shown in the Table 14 below.

Table 14: Soil quality standards in Kazakhstan [6]

Substance	Maximum Allowable Concentration, mg/kg	Limiting Rate
Manganese (gross form)*	1500	According to the General Sanitary Norms

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

Substance	Maximum Allowable Concentration, mg/kg	Limiting Rate
Cupric (flexible form)*	3.0	According to the General Sanitary Norms
Lead (gross form)	32.0	Translocational
Zink (gross form)*	23.0	Translocational
Arsenic (gross form)	2.0	According to the General Sanitary Norms
* Due to the absence of these substances in new SanPiN data was taken from the previous document «Standards of the Maximum Allowable Concentrations of the Hazardous Substances, Harmful Microorganisms and Other Biological Materials Being the Soil Pollutants» approved by the Order of the Ministry of Health of the GoK №99, 30.01.2004 and Order of the Ministry for Environmental Protection of the GoK №21П, 27.01.2004.		

D.3.4 Noise

215. The sanitary rule regulating on noise level within settlements is SanPiN of GoK № 3.01.035-97 «Maximum Allowable Noise Levels in Residential and Public Buildings and in Residential Areas». In addition to establishing acceptable standards, noise levels are generally regulated with respect to sound levels at specific places referred to as "sensitive receptors" such as schools, hospitals or, in the absence of such facilities, at residential buildings or a given distance from the source of the noise.

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

- Daytime (0700 – 2300) 55dB(A)
- Nighttime (2300 – 0700) 45 dB(A)[7]

217. The IFC also publish noise limits for residential areas which are similar to the Kazakh standards with the exception of the timings, with daytime noise being classified as 0700 to 2200, see Table 15.

Table 15: IFC Noise Level Guidelines

Receptor	One hour L_{aeq} (dBA)	
	Daytime 07.00-22.00	**Night-time 22.00 – 07.00**
Residential; institutional; educational	55	45
Industrial; commercial	70	70

218. For workplace noise the following IFC standards are applicable.

Table 16: IFC Work Environment Noise limits

Type of Work, workplace	IFC General EHS Guidelines
Heavy Industry (no demand for oral communication)	85 Equivalent level Laeq,8h
Light industry (decreasing demand for oral communication)	50-65 Equivalent level Laeq,8h

[7] https://docs.google.com/spreadsheets/d/19FPk9Mwxe122qu07FEb0pOS7fbh8yozQmdpZcArDcPE/edit#gid=0

D.3.5 Vibration

219. Construction vibration limits are set by the technical regulations 'Requirements for the safety of road construction materials' of Kazakhstan, Decree No. 1331 of the GoK, December 21, 2008.

220. The regulations state that the vibration level of the equipment should not exceed 12 decibels and the sound pressure level – 135 decibels in any octave band.

221. The German Standard DIN 4150-3 – Vibration in Buildings – Part 3: Effects on structures provides short term and long term limits for vibration at the foundation for various structures (see Table 17). This standard is considered international best practice and will be followed as part of the Project.

Table 17: Effect of Vibration on Structures

Type of Structure	Short term vibration				Long term vibration
	Vibration at the foundation at a frequency of			PPV at horizontal plane of highest floor (mm/s)	PPV at horizontal plane of highest floor (mm/s)
	1 Hz-10 Hz	10 Hz-50 Hz	50 Hz-100 Hz		
	(mm/s)	(mm/s)	(mm/s)		
Commercial / Industrial	20	20 to 40	40 to 50	40	10
Residential buildings	5	5 to 15	15 to 20	15	5
Historic or sensitive structures	3	3 to 8	8 to 10	8	2.5

Source: DIN 4150-3, Structural Vibration, Part 3: Effect of vibration on structures, Table 1 and 3

D.3.6 Health and Safety

222. During the construction phase it is necessary to meet the requirements of CSaR 3.06.04-91 "Construction Safety". Also there are other regulations such as the «Safety Regulations for Construction, Repair and Maintenance of the Automobile Roads», «Regulations for Safety and Production Sanitary During the Building of the Bridges and Pipes», that should be followed strictly. During road construction works it is necessary to use the «Safety Instructions» for each construction equipment.

223. Personal protective equipment shall comply with the applicable GOST (special aprons under the GOST 12.4.029, rubber gloves under the GOST 20010, respirator "The Petal" under the GOST 12.4.028, gloves under the GOST 12.4.010, goggles under the GOST 12.4.013 and breathing mask of B type or B with filter, helmets).The site should be kept in safe, clean and good sanitary conditions. The Contractor shall bear the responsibility for clean-up of the site from garbage, construction waste and household rubbish and their removal to the municipal solid waste landfill (MSW). In this regard the Contractor shall be guided by the CSaR No3.01.016.97

224. In addition, the World Bank Group Environmental Health and Safety Guidelines will be used as a reference for health and safety during construction and operation throughout the

whole project. In case, there is a conflict between the national legislation and the World Bank Guidelines the more stringent standard shall be implemented.

D.3.7 Physical Cultural Heritage

225. The main legislative documents on cultural heritage are the followings:

- The Law of the Republic of Kazakhstan "About Culture", dated 15.12.2006 No.207-III
- The Law of the Republic of Kazakhstan "On Protection and Use of the Historical Cultural Heritage", dated 2.07.1992 No.1488-XII
- The Land Code of the RK, dated 20.06.2003 No.442-II.

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

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

227. According to Art. 127 of the Land code of the Republic of Kazakhstan dated June 20, 2003 No.442-II construction works without carrying out of archaeological examination are connected with risks for the project.

228. According to Art.39 of the Law of the Republic of Kazakhstan "About protection and use of objects of historical and cultural heritage". That is, after full archaeological studying of the monuments, located in a zone of road construction and their removal from the State account:

- The survey on identification of objects of historical and cultural heritage have to be carried out prior to land acquisition.
- In case of detection of the objects having historical, scientific, art and other value, private and juridical persons are obliged to suspend further works conducting and to report about it to authorized body.
- Work conducting, which can create threat to existence of objects of historical and cultural heritage is forbidden.

229. Any works, which can expose to danger the existing monuments, are forbidden. The enterprises, organizations, institutes, public associations and citizens in case of identification of archaeological or other sites of historical, scientific and cultural value, are obliged to inform authorized bodies on preservation and use of historical and cultural heritage, and to stop the current works.

D.3.9 Waste

230. The following summarizes the Environmental Code requirements for waste management including the requirements for hazardous waste management.

231. ***Article 286. Industrial and Consumption Waste. Types of Industrial and Consumption Waste*** - In terms of hazard they may pose, industrial and consumption waste

may be hazardous, non-hazardous, and inert. Hazardous waste is the waste that contains one or several of the following substances:

1. explosives;
2. highly inflammable liquids;
3. highly inflammable solid substances;
4. self-inflammable substances and waste;
5. acidifying substances;
6. organic peroxides;
7. poisonous substances;
8. toxic substances causing long-lasting and chronic disease;
9. infectious substances;
10. corrosive substances;
11. eco-toxic substances;
12. substances or waste giving off flammable gases when put in contact with water;
13. substances or waste which may give off toxic gases when put in contact with the air or water; and
14. substances and materials that may form other materials with one of the above mentioned properties.

Article 288. General Environmental Requirements Applicable upon Treatment of Industrial and Consumption Waste

1. Individuals and legal entities, whose undertakings generate waste, must implement measures of safe treatment of the waste, comply with environmental and sanitary and epidemiological requirements, and carry out recycling, neutralization and safe disposal of the same.
3. The places of placement of waste are designated for safe storage of waste for up to three years if the waste is to be recovered or processed, or for up to one year if the waste is to be buried.
5. Waste owners must ensure a gradual reduction of the volumes of waste throughout the entire production cycle, including through the improvement of production processes, waste recycling, and giving the waste out to individuals and legal entities who are interested in using it.
6. When choosing methods and places for neutralization and placement of waste and selecting individuals and legal entities to carry out the processing, disposal or placement of waste, the owners of the waste must ensure that the movement of the waste from their source of origin is kept to a minimum.

Article 290. Environmental Requirements Applicable upon Planning of Activities Related to Waste Treatment

1. In the design of facilities the operation of which generates waste, there shall be mandatory to:
1) prepare a waste management program as an integral part of the project documentation;
2. In the design of residential buildings, industrial enterprises, buildings, premises, facilities and other objects the operation of which generates waste there shall be necessary to provide spaces (sites) for the accumulation of waste in compliance with the rules, regulations and requirements established by the environment protection authority and the government agency for sanitary and epidemiological well-being of the population.

Article 296. Waste Accounting

1. The owners of waste must keep waste accounting (type, quantities and origin of the waste) and collect and keep information on waste's properties that endanger the environment and/or human health.
3. The owners of waste must keep waste accounting records for a period of five years.
4. The owners of waste must on an annual basis submit to the environment protection authority reports on their activities in respect of waste management, in order for this information to be entered into the State Registry of Wastes.

Article 289. Hazardous Waste Profile Sheet

1. A hazardous waste profile sheet must be prepared and approved by individuals and legal entities if their undertakings generate hazardous waste.
5. The hazardous waste profile sheet must be registered with the environment protection authority within three months after the waste has been generated.
7. Copies of the registered hazardous waste profile sheets must be issued to the individual or legal entity carrying out transportation of a lot of hazardous waste or part thereof, as well as to each consignee of such lot (or part thereof).
12. A hazardous waste profile sheet must contain the information on precautionary measures to be taken in order to prevent and mitigate the consequences of emergencies that may be caused by the hazardous waste, including those arising in the course of transportation and loading/unloading operations.

Article 293. Environmental Requirements Applicable upon Handling Hazardous Waste

1. Individuals and legal entities whose undertakings and activities generate waste must carry measures aimed at the prevention or reduction of the formation of waste and/or reduction of the level of hazard posed by waste.
3. The owner of hazardous waste must ensure labelling of packages containing hazardous waste wherein their hazardous properties would be denoted. When transferring such hazardous waste to other persons for a certain period of time, the owner of the waste must inform them in writing of the waste's hazardous properties and of handling precautions that need be taken.
4. There shall be prohibited to mix hazardous waste with non-hazardous or/and inert waste, as well as intermix different types of hazardous waste in the course of production, transportation and placement.
5. The placement of hazardous waste must be performed at specifically equipped places pursuant to the requirements set out in environmental permits. Carrying out any other activities at the waste placement site that are not directly related to waste treatment shall be prohibited.
6. Enterprises whose business is to collect, recycle, transport and dispose hazardous waste must develop emergency and accident action plans.

Article 294. Environmental Requirements Applicable upon Transportation of Hazardous Waste

1. Formation of hazardous waste and their transportation must be kept to a minimum.
2. Transportation of hazardous waste shall be permitted subject to the following conditions:

1) hazardous waste is packaged and labelled as appropriate for purposes of transportation;

2) hazardous waste is transported in properly equipped transportation means having special signs;

3) a hazardous waste profile sheet is present along with documentation for transportation and transfer of hazardous waste, with information on the volumes of hazardous waste being transported, purpose of transportation, and place of destination; and

4) safety requirements for transportation of hazardous waste and loading/unloading operations are met.

D.3.9 International Conventions and Treaties

232. Kazakhstan is a signatory of the following international conventions an treaties relevant to environmental issues.

Table 18: International Conventions and Treaties

#	Convention Name	Description/Convention Objectives
1.	The Convention on Conservation of Migratory Species and Wild Animals	Aims to prevent a danger of extinction of migratory migratory species; implementation of scientific research related to migratory species and their protection.
2.	Convention on International Trade of Endangered Species of Wild Flora and Fauna (CITES)	Its aim is to ensure that international trade of wild animals and plants does not threaten the survival of the species; the agreement provides for varying degrees of protection to more than 35,000 species of animals and plants.
3.	Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, Aarhus, 1998, June 25th.	The convention promotes protection of the right of each person of present and future generations to live in the environment favourable for his health and welfare. Each Party that signed the present Convention grants the rights regarding access to ecological information, participation of the public in decision-making process for access to justice on the environmental issues according to the provisions of the present Convention.
4.	Convention on the International Trade in Endangered Species of Wild Flora and Fauna (Washington, March, 3, 1973):	The Convention sets the rules for the international trade in endangered species of wild flora and fauna. The trade of these species must be supervised to ensure that international trade of wild animals and plants does not threaten the survival of the species in the wild and can be permitted only under exceptional circumstances.
5.	UN Convention to Combat Desertification	The Convention aims to combat desertification and mitigate the effects of drought through the integrated approach aimed at achievement of sustainable development in affected areas including the increase of lands efficiency, rehabilitation, preservation, stable and rational use of land and water resources to improve living standards, especially communities.
6.	Convention on Biological Diversity (Rio de Janeiro, June, 5, 1992)	The goals of the Convention are the conservation of biological diversity, sustainable use of its components and fair and equitable sharing of benefits arising from genetic resources including access to genetic resources and transfer of relevant technology with the account of all rights for such resources and technology as well as through proper financing.
7.	Convention on Protection of the World Cultural and Natural Heritage (Paris, November, 16 1972):	The Convention: – adopts a general policy which aims to give special functions to the cultural and natural heritage in public life and to integrate protection of that heritage into the comprehensive planning programs. – sets up within its territories, where such services do not still exist, one or more services for protection, conservation and promotion of the cultural and natural heritage.

#	Convention Name	Description/Convention Objectives
		– develops scientific and technical studies and research, methods of work, allowing the state to counter dangers that threaten its cultural or natural heritage
8.	Kyoto Protocol to the UN Framework Convention on Climate Change (Kyoto, December, 11, 1997).	– At present the Amendment to Kyoto-2 is not ratified in the Republic of Kazakhstan. Kazakhstan does not enter the list of the countries of the Appendix B of the Kyoto Protocol. The National plan of distribution of quotas for the amount of greenhouse gas emissions for 2014-2015 has been adopted in Kazakhstan. (The resolution of the Government of the Republic of Kazakhstan dated December 31, 2013 No. 1536). The Kyoto Protocol regulates: – Obligations for restriction and reduction of greenhouse gas emissions. – Implementation of policy and measures for increase of the efficiency of use of energy, stable forms of agriculture, protection and improvement of quality of absorbers and stores of greenhouse gases.
9.	UN Framework Convention on Climate Change, May, 9, 1992	The objective of the Convention is to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference in the climate system", in the terms sufficient for natural adaptation of ecosystems to climate change allowing not to pose risks to food production and providing further economic development on a stable basis.

D.4 ADB Safeguard Policies

233. The ADB has three safeguard policies that seek to avoid, minimize or mitigate adverse environmental impacts and social costs to third parties, or vulnerable groups as a result of development projects[8].

Safeguard Requirements 1: Environment.

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

1. Use a screening process for each proposed project, as early as possible, to determine the appropriate extent and type of environmental assessment so that appropriate studies are undertaken commensurate with the significance of potential impacts and risks. (***The Project was initially screened by the ADB and classified as a Category B project***)
2. Conduct an environmental assessment for each proposed project to identify potential direct, indirect, cumulative, and induced impacts and risks to physical, biological, socioeconomic (including impacts on livelihood through environmental media, health and safety, vulnerable groups, and gender issues), and physical cultural resources in the context of the project's area of influence. Assess potential transboundary and global impacts, including climate change.

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

Use strategic environmental assessment where appropriate. (***The IEE herewith provides the environmental assessment for the Project, including an assessment of climate change. Transboundary impacts are not applicable***).

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

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

5. Carry out meaningful consultation with affected people and facilitate their informed participation. Ensure women's participation in consultation. Involve stakeholders, including affected people and concerned nongovernment organizations, early in the project preparation process and ensure that their views and concerns are made known to and understood by decision makers and taken into account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people's concerns and grievances regarding the project's environmental performance. *(**Consultations were held in Aktobe Oblast to discuss environmental issues, the findings of the consultations (and a description of the Project grievance redress mechanism) are presented in Section G - Public Consultation, Information Disclosure & Grievance Mechanism****)*

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

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

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

9. Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group's Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not

possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the use of hazardous materials subject to international bans or phase-outs. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides. *(**The IEE and its EMP outline specific mitigation and management measures to prevent and control pollution: Section F - Environmental Management Plans and Institutional Requirements. No pesticides will be used during the lifecycle of the Project)***

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

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

Safeguard Requirements 2: Involuntary Resettlement.

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

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

Safeguard Requirements 3: Indigenous Peoples.

237. The objective is to design and implement projects in a way that fosters full respect for Indigenous Peoples' identity, dignity, human rights, livelihood systems, and cultural uniqueness as defined by the Indigenous Peoples themselves so that they (i) receive culturally appropriate social and economic benefits, (ii) do not suffer adverse impacts as a result of projects, and (iii) can participate actively in projects that affect them. (***The Project does not involve impacts to Indigenous Peoples and therefore no further actions relating to this safeguard are required***).

E. Description of the Environment

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

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

239. The potential impacts of the Project on its surrounding physical and biological environments include air and water quality impacts, noise generation, land transformation and changes to soil. These are expected to reduce with the increased distance from the Project facilities, affecting more the areas located closer, up to one kilometer, to the Project alignment. For this, a study area of one kilometer around the site was delineated, to assess the baseline conditions in the areas likely to be affected by the Project due to its proximity to the Project site. This is referred to as the Project Area in this report. The Project Area selected for the IEE includes sensitive receptors [9] that are most likely to be impacted by the Project's development activities.

E.1 Physical Resources

E.1.1 Topography and Geology

Regional Context

240. Aktobe oblast is located in the northwestern part of the Republic of Kazakhstan and borders with Western Kazakhstan, Atyrau and Mangystau oblasts in the west; Kostanay, Karaganda and Kyzylorda oblasts in the east; Orenburg oblast of the Russian Federation in the north and Karakalpakstan autonomous region of Uzbekistan in the south. Figure 10 illustrates the topography of Kazakhstan as a whole and the approximate location of the Project road.

Local Context

241. The Project road is located in the southern part of the Aktyubinsk fore-Urals, which is part of an extensive plateau. Geologically, most of the Project area has been formed mainly by marine sediments, the formation of which began already with the Thetys Ocean during the Mesozoic era. During the Quaternary, the Caspian Sea had high water levels, flooding vast parts of Aktobe Oblast.

242. Geological elements of the project area include the sandy loam of greyish, brown color and of solid consistence.

243. The topography of the Project area itself is an undulating plain with alternating flat ridges and flat plains that range from 236 meters above sea level (masl) at the start of the road in Aktobe to 250 masl in Bestamak and Alga and 300 masl at the end of the road in Kandyagash. Extensive dry hollows, dry beds of ancient and modern water streams are widespread in the project area. **Appendix B – Environmental Setting**, clearly illustrates the flat nature of the topography in the Project area.

[9] Sensitive receptors include, but are not limited to, residential areas, schools, places of worship, wetlands, and habitats. These are areas which are more susceptible to the adverse effects of an anthropogenic activity such as noise, air emissions, traffic influx, and privacy issues

Figure 12: Topography of Kazakhstan

E.1.2 Soils

244. In geological terms, the surface soils mainly consist of light brown dry steppe soil types that mostly occupy carbonate rich sandy loam and clay. Top-soils of about 20 cm are generally poor in humus, up to 2 %. Salt crusts often appear at the soil surfaces. In the entire road corridor there are deposits of quaternary age. Among the quaternary deposits there are a variety of alluvial deposits of sandy loam and clay.

245. Industrial activities can be found throughout Aktobe Oblast some of which are relics from the former Soviet Union. Some of these facilities were significant polluters of the environment, including the now redundant Chemical Plant in Alga which is located in the north west of the town (the program is underway to demolish the facility and rehabilitate the land, including clean-up of any toxic land).

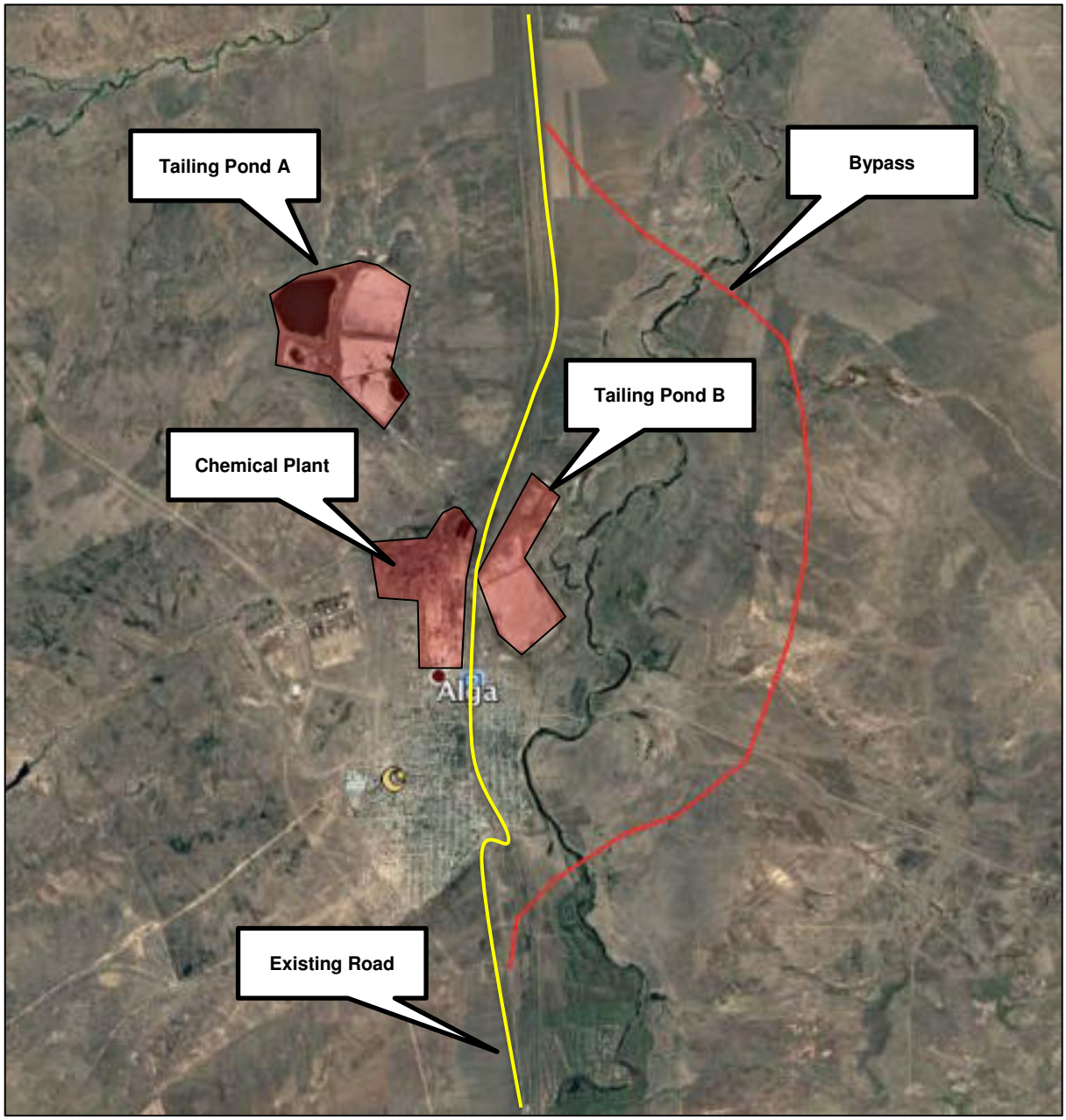
246. The Project road will be located, on average, more than 3km east of the chemical plant and its tailing ponds. This is due to the fact that in Alga the road deviates from the existing road via a new bypass.

247. Research conducted by PGO Zapkazgeologiya, Aktobe GGE (Akpan LLP), Hydrometeorology Center, Gossanepidnadzor laboratories in the territory of the chemical plant and in Alga, identified high concentrations of a number of chemical elements in the soil and in soils, many of which are toxicants.

248. In the territory of the town and the chemical plant, ecological and geochemical samples were taken from the soils through a 400 x 400 m network with thickening of the network up to 200 x 200 m in the area of the main industrial site of the plant. Samples were also collected around the tailings ponds. At the same points, a radiometric survey was carried out. To study the distribution of the concentrations of chemical elements to depth, a pit was drilled to a depth of 100 cm.

249. All selected soil samples were analyzed by an emission spectral method for 40 elements. In addition, an analysis for fluorine using an atomic absorption method was performed. Along with the determination of gross concentrations, the content of mobile forms of Pb, Cu, Zn was estimated.

Figure 13: Location of Alga Chemical Plant



250. Soil pollution in the territory of the town was classified as moderately hazardous pollution. In the territory of the city, in various parts of it, there were increased concentrations of copper, lead, zinc, silver, barium, strontium, phosphorus, tin, arsenic, boron, iron, mercury, fluorine. When examining pollution maps, it was shown that most of the abnormal zones are concentrated in the part of the city adjacent to the plant territory, as well as along roads running from the plant both to the city of Alga and to Aktobe. Soil contamination around both tailing ponds was classified as moderately hazardous pollution.

251. When comparing the results of the geochemical survey of 1988-1990 with the results obtained in 2009, it was revealed that soil contamination on the industrial site practically did not change and corresponded to the level of 1990.

252. In the city of Alga, on the contrary, there was a decrease in the level of pollutants in the soil. Thus, the average concentrations for arsenic and silver decreased more than 3-fold, more than twice for copper, lead, strontium, cerium. It was suggested that this reduction in the level of soil contamination was due to the fact that the dust emissions through the pipes of the

plant ceased, which, in conditions of strong wind spacing, created the possibility of soil contamination in vast areas.

253. As a result of measurements of gamma-background levels in the study area, there were no excesses of regulated sanitary standards.

Figure 14: Dried up Tailing Pond A

E.1.3 Hydrology

254. General - Kazakhstan is divided into eight river basins (see Figure 14: Main River Basins of Kazakhstan). The Project road is located within the Ural-Caspian river basin which occupies an area of 415,000 km^2 and includes the catchment area of the Ural River (236,000 km^2).[10] Groundwater tables in are mostly deep, and quality is poor due to salt intrusion. However, given enough depth, good quality water can be found in abundance for technical and potable supplies.

255. The hydrology of the Project area is discussed in terms of its surface and groundwater hydrology.

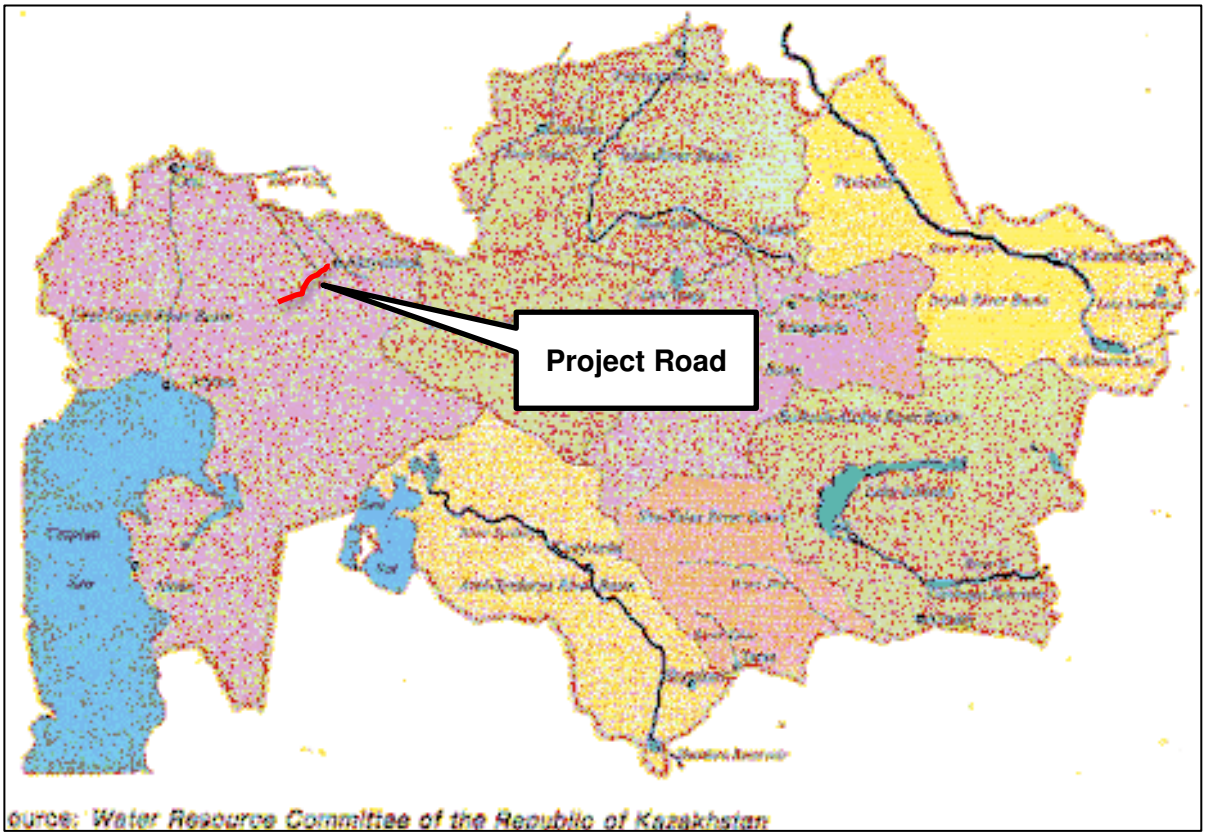
256. **Surface water** - The Ilek (or Elek in Kazakh) a transboundary river (flowing from Russia through Kazakhstan and into the Caspian Sea) and left tributary of Ural River dominates the surface hydrology of the project area. The river takes its rise at north-west slopes of Mugodjar (Bestobe ridge) in Kazakhstan, the southern branch of Urals Mountains within the afore mentioned Ural-Caspian river basin. Its length of the river is 623 km, and the catchment area of the river – 41.3 thousand square km.

257. Ilek has a wide, well-developed valley with two terraces above the floodplain, the width in the middle reaches from 0.7 to 1 km. The river banks are steep in places. The bottom of the river is sandy and sandy loamy, in some areas sandy-pebbly and loamy, sometimes slightly silted. The average long-term discharge near the Aktobe is 20.8 m^3. Depth of the river varies from 0,8 - 1,0 to 1,0 - 1,8 m. The current velocity is 0.3-0.5 m / sec. Water flow rates vary from 3 to 17 m^3 / s. The average mineralization of water during flooding is 0.2-0.4 g / l, and in

[10] http://www.cawater-info.net/bk/water_land_resources_use/english/index.html

summer when the water table is low it rises to 0.7-0.9 g / l. The major tributaries of Ilek River are – Kobda, Karagala, Tamdy, Sazdy, and Zhinishke.

Figure 15: Main River Basins of Kazakhstan



258. The propose Project road by-pass around Alga will cross the Ilek river in two points as indicated in Table 3.

259. The river network of the area includes also seasonal rivers (tributaries of Ilek) which are crossed by the Project road in the points indicated in Table 19 and illustrated by **Appendix A**.

Table 19: Other Rivers Crossed in the Project Area

#	Km	River
1	18.5	Kumsay river
2	30.5, 64.1	Batpakty river
3	39.4, 39.4	Suyk su cyriver
4	67.2	Talasbay river
5	79.2	Tabantal river

260. In annual terms, the flow pattern of most rivers is characterized by high springs floods and low summer water levels. After the spring floods summer-autumn low water season follows – flow sharply decreases, and on some of the rivers flow disappears completely, except water streams fed by underground water. Freezing of rivers in winter is observed in all rivers of the region.

261. During high floods water frequently overflow its banks in the rivers within the Project area. This is the time when large part of river sediments is passing. Chemical composition of dissolved salts changes from hydrocarbonates to chlorides over the year. This is because of different concentration of salts in soils, on which soil surface and riverbed waters are being formed.

262. Aktobe Reservoir with an active storage capacity of 220 million m^3 is designed primarily for irrigation and water supply and was constructed on the Ilek river. The reservoir runs parallel to the road for approximately 15km, from the start of the road to Bestamak. However, the Project road is generally located between 250 and 1,000 meters east of the reservoir.

Figure 16: Ilek River, KM 38.5 (location of bridge crossing)

263. Overall, in 2017, surface water quality monitoring in Kazakhstan was being conducted on 404 hydro chemical monitoring stations (12 in Aktobe oblast) over 133 water bodies including 86 rivers, 14 reservoirs, 28 lakes, 4 canals and 1 sea. Among parameters monitored are ammonia, boron, iron (2+ and total), cadmium, copper, arsenic, magnesium, manganese, nitrites, nitrates, nickel, mercury, sulfates, fluorides, chlorides, chromium, zinc, phenols, and oil products.

264. Water quality is assessed by comparing pollutants' concentrations with Maximum Allowable Concentrations (MACs) for fisheries for each pollutant observed. MAC is measured in mg/l. In addition to that the level of water pollution is assessed by complex water pollution index (CWPI), which is used for comparison and identification of change in water quality.

Table 20: General classification of water bodies by pollution level

#	Pollution level	Indicators of water body pollution		
		by CWPI	By O_2, mg/dm^3	по $БПК_5$, мг/$дм^3$
1	Regulatory clean	≤ 1,0	≥4,0	≤3,0
2	Moderately polluted	1,1÷3,0	3,1-3,9	3,1-7,0
3	Highly polluted	3,1÷10,0	1,1-3,0	7,1-8,0
4	Extremely highly polluted	≥10,1	≤1,0	≥8,1

*Guidelines on integrated assessment of surface water quality through hydrochemical indicators, Astana, 2012.

265. The most recent water quality monitoring undertaken in the Ilek shows the water temperature ranged from 0ºC to 26ºC, pH – 7.68, averaged dissolved oxygen was 10.24 mg/dm^3, BOD5 – 2.28 mg/dm^3. Exceedances of MAC were registered for biogenic substances

such as boron (+3) – 7.8 MAC, ammonia salts – 3.4 MAC, for heavy metals such as copper (2+) – 5.2 MAC, zinc (2+) – 1.4 MAC, chromium (6+) – 4.2 MAC, chromium (3+) – 3.0 MAC, manganese (2+) – 4.4 MAC, and for organic substances (phenols – 1.2 MAC).

266. In surface water the highest concentrations of boron, fluorine, and phosphorous were reported in water of tailings ponds. In the Ilek River high concentrations of boron (20-40 MAC) were found in central part of the river, in the vicinity of the chemical plant tailings ponds in Alga. Upstream of the chemical plant no exceedances of boron and fluorine were reported. Drinking water of water supply system in Alga town complied with all regulatory requirements of Sanitary Regulations and Norms.

Table 21: Assessment of water pollution of Ilek River

Complex water pollution index (CWPI) and class of water quality		**Concentration of pollutants in 2017**		
for 2016	**for 2017**	**Water quality parameters**	**Average concentration , mg/dm3**	**Exceedance, times**
9,75 (regulatory clean)	10,24 (regulatory clean)	Dissolved oxygen	10,24	
2,33 (regulatory clean)	2,28 (regulatory clean)	BOD_5	2,88	
4,93 (high level of pollution)	3,48 (high level of pollution)	**Biogenic substances**		
		Boron (3+)	0,133	7,8
		Ammonia salts	1,69	3,4
		Heavy metals		
		Copper (2+)	0,0052	5,2
		Manganese (2+)	0,044	4,4
		Zinc (2+)	0,014	1,4
		Chromium (6+)	0,083	4,2
		Chromium (3+)	0,015	3,0
		Organic substances		
		Phenols	0,0012	1,2

Source: Information Bulletin on State of the Environment in Kazakhstan for 2017. Ministry of Energy of RoK, and Kazhydromet (Department of Environmental Monitoring)

267. **Groundwater -** The project area is in the eastern part of the Caspian plain, composed of thick strata of sedimentary rock. Hydrologically, this is an eastern side of Caspian artesian basin, specifically Ural-Emba system of small artesian basins. The key sources of groundwater supply are infiltration of precipitation and floodwater, snowmelt, as well as supply from water-carrying complexes of Albian and Cenomanian, and less frequently Jurassic deposits where river valleys cross arched uplifts of domes. Groundwater conditions of alluvial deposits are closely interrelated with surface water conditions. Maximum groundwater levels are observed in April – May during floodwater period with gradual reduction to July – August, and insignificant raise in autumn.

268. One of the key environmental issues of the project's area is contamination of groundwater of Ilek River valley by boron. The major source of the substance is tailings ponds of boric acid production, constructed without any protective screens in dead arms and floodplain of the river on alluvial quaternary sand-gravel sediments with high permeability. According to geo-environmental survey conducted in 2008 near the tailings ponds, concentrations of boron, fluorine, bromine, manganese, sodium, magnesium, and strontium in groundwater exceeded maximum allowable concentrations. However, as noted above drinking water in Alga town complied with all regulatory requirements of Sanitary Regulations and Norms.

E.1.4 Natural Hazards

269. The examination of seismic zoning of the road specified in the IEE of Aktobedorproject defines the entire area as "non-seismic". A map indicating the low seismic hazard classification of the Project area is provided by **Appendix C**.

270. As noted above, spring floods do occur in the Project area. The flood levels have been taken into account in the design of hydrological structures, such as bridges, and drainage as part of the detailed design.

E.1.5 Air Quality

271. **National Context**. Air quality monitoring in Kazakhstan is being conducted at 146 monitoring stations (including 56 stationary ones) in 49 cities and towns in 2017. Among pollutants monitored on the stationary stations are dust, PM-2.5, PM-10, dissolved sulfates, carbon dioxide, carbon monoxide, nitrogen dioxide, nitrogen oxide, ground-level ozone, hydrogen sulfide, phenol, hydrogen fluoride, chlorine, hydrogen chloride, hydrocarbons, ammonia, sulfuric acid, formaldehyde, methane, arsenic compounds, cadmium, lead, chromium, copper, benzene, benzopyrene, beryllium, manganese, cobalt, zinc, and gamma radiation.

272. Air quality is assessed by comparing pollutants' concentrations with Maximum Allowable Concentrations (MAC) for each pollutant observed. MAC is measured in mg/m^3 or mcg/m^3. MACs are established as average daily and maximum one-time concentrations. Average daily MAC is the one that do not have any direct or indirect impacts on human's health for long period (years) of time. One-time MAC do not cause reflex reaction in humans after short-term (20-30 min) inhalation. Among indicators used to assess air quality are:

a. Standard Index (SI) – the highest measured concentration of any pollutant in the settlement divided by MAC;
b. Maximum Times of Occurrence (MTO), percent of exceedance of MAC – maximum occurrence of exceedance of MAC by any pollutant in the settlement;
c. Air Pollution Index (API) – calculated based on average pollutant concentrations divided by MAC and normalized to hazard of sulfur dioxide.

Table 22: Assessment of air pollution

Level		Indices Air Quality Pollution	Yearly points
Gradations	**Air Quality pollution**		
I	Low	SI MTO, % API	0–1 0 0–4
II	Elevated	SI MTO, % API	2–4 1–19 5–6
III	High	SI MTO, % API	5–10 20–49 7–13
IV	Very high	SI MTO, % API	> 10 > 50 ≥ 14

Note: If indices fall under different gradations, then the API is used.

273. **Local Context.** Air quality monitoring in the Project area was conducted in 2 towns: Aktobe and Kandyagash in 2017. In Aktobe, monitoring is conducted on stationary monitoring stations including 3 automated and 3 non-automated units, and in Kandyagash only occasional monitoring data are available.

274. Aktobe. In 2017, based on calculations of SI, MTO, and API, air pollution in Aktobe was assessed as "elevated", like 2016 assessments. It is also worth noting extremely high SI observed for hydrogen sulfide: specifically, near monitoring station 2. Table 23 demonstrates air quality data in Akobe in 2017. Average daily concentrations of ground level ozone amounted to 2.8 $MAC_{a.d}$. No exceedances have been observed for other pollutants. Maximal one-time concentrations measured for PM-2.5 – 3.1 MAC, PM-10 – 6.3MAC, sulfur dioxide – 7.0 MAC, carbon monoxide – 4.8MAC, nitrogen dioxide – 1.3 MAC, nitrogen oxide – 1.4 MAC, ground-level ozone 1.8 MAC, ammonia – 1.5 MAC, formaldehyde – 3.3 MAC, and hydrogen sulfide – 29.94 MAC. The remaining pollutants have not exceeded the MAC.

275. As noted above, one of the most serious environmental issues in Aktobe is high air pollution by hydrogen sulfide. Overall, in 2017, 141 cases of high pollution (HP) and 3 cases of extremely high pollution (EHP) was registered in Aktobe. All those cases were associated with hydrogen sulfide with its concentration ranging from 10 to 30 one-time MAC. Burst releases of the pollutant depends on atmospheric pressure, temperature, and wind direction. It is reported that among sources of air pollution sludge beds of city's sewage treatment plant, as well as numerous food service companies, and distilling plants dumping sulfur-containing waste and wastewater into canalization system. Poor condition of canalization contributes to the issue. Presently, city's administration and environmental authorities are trying to solve the problem by urging polluters to apply odor control technologies.

Table 23: Air quality in Aktobe in 2017

Pollutant	Average daily concentration ($g_{a.d.}$)		Maximum one-time concentration ($g_{m.ot.}$)		Frequency of exceedances over $MAC_{m.ot.}$		
	mg/m^3	Exceedance ratio over average daily concentration	mg/m^3	Exceedance ratio over $MAC_{m.ot}$	>MAC	>5 MAC	>10 MAC
Suspended particles (dust)	0.031	0.21	0.400	0.80			
PM-2.5	0.02	0.5	0.5	3.1	45		
PM-10	0.04	0.7	1.9	6.3	282	1	
Sulfates	0.0021		0.05				
Sulfur dioxide	0.012	0.244	3.519	7.0	21	1	
Carbon monoxide	1	0.5	24	4.8	733		
Nitrogen dioxide	0.02	0.53	0.26	1.3	23		
Nitrogen oxide	0.01	0.15	0.55	1.4	2		
Ozone (surface)	0.083	2.8	0.293	1.8	3028		
Hydrogen sulfide	0.002		0.240	29.9	2314	401	144
Ammonia	0.004	0.09	0.302	1.5	2		
Formaldehyde	0.003	0.293	0.166	3.3	5		
Chromium	0.0003	0.2267	0.003				
Hydrocarbons	0.0		0.0				
Methane	0.0		0.0				

Source: Information Bulleting on State of the Environment in Kazakhstan for 2017. Ministry of Energy of RoK, and Kazhydromet (Department of Environmental Monitoring)

276. Kandyagash. Air quality monitoring in Kandyagash was conducted from time to time in two locations (sampling point #1 – Zapadnaya Str, sampling point #2 – Seifullina Str). Among pollutants monitored were PM-10, nitrogen oxides, sulfur dioxide, carbon monoxide, hydrogen sulfide, ammonia, and formaldehyde. Concentrations of ammonia at point #1 was 6.9 one-time MAC, hydrogen sulfide – 4.9 one-time MAC, carbon monoxide – 1.5 one-time MAC. Concentrations of ammonia at point #2 was 8.8 one-time MAC, hydrogen sulfide – 3.1 one-time MAC, sulfur dioxide – one-time MAC 1.8, and carbon monoxide – 1.4 one-time MAC. Concentrations of other pollutants were within the MACs.

Table 24: Air quality in Kandyagash in 2017

Pollutants	Sampling points			
	#1		#2	
	$q_m$mg/m^3	q_m/MAC	$q_m$mg/m^3	q_m/MAC
PM-10	0,05	0,16	0,06	0,20
Sulfur dioxide	0,005	0,010	0,91	1,8
Carbon monoxide	7,5	1,5	7,0	1,4
Nitrogen dioxide	0,02	0,095	0,03	0,16
Nitrogen oxide	0,01	0,02	0,02	0,05
Hydrogen sulfide	0,04	4,9	0,025	3,1
Ammonia	1,38	6,9	1,76	8,8
Formaldehyde	0	0	0	0

277. **Project Area Context -** In addition to the above, baseline air quality monitoring has been undertaken in the Project area during September, 2018 to assess further the actual conditions within the Project area. A national company was provided with a scope of works to undertake air quality monitoring in two locations within the Project corridor, at the start of the road (approximately KM0.2) and in the center of Bestamak (The scope of works and monitoring locations with maps are provided by **Appendix D**). These locations the only two residential areas that are close to the proposed Project alignment. The results of the monitoring are summarized below and provided in full by **Appendix E**.

Table 25: Air Quality Monitoring Results, KM 0.2

#	Location of measurement (sampling point)	Results of measurements, mg/m^3			
		SO_2	NO_2	Suspended particles	CO
1.	50°11'36.78"N 57°16'38.39"E (morning)	0.0233	0.00912	0.0196	0.664
2.	50°11'36.78"N 57°16'38.39"E (evening)	0.0159	0.00909	0.0463	0.633
National Standard*		**-**	**0.2**	**0.5**	**5.0**
IFC Standard		**0.5****	**0.2*****	**-**	**-**

Table 26: Air Quality Monitoring Results, Bestamak

#	Location of measurement (sampling point)	Results of measurements, mg/m^3			
		SO_2	NO_2	Suspended particles	CO
1.	50°02'46.41"N 57°20'46.79"E (morning)	0.00825	0.00911	0.0216	0.118
2.	50°02'46.41"N 57°20'46.79"E (evening)	0.0115	0.00914	0.0231	0.622
National Standard*		**-**	**0.2**	**0.5**	**5.0**
IFC Standard		**0.5****	**0.2*****	**-**	**-**

* One time Maximum

** Ten Minute Averaging Period

*** One Hour Averaging Period

278. The results, which provide a 'snapshot' of the air quality in the Project area on this particular day of the year show that ambient air quality is well within the guidelines limits set by the IFC and well below national standards for all parameters.

279. Although Aktobe and Kandyagash have been identified as areas of quite high air pollution there are currently no major point sources of air emissions within the Project corridor itself and the only major emissions of air quality result from vehicle traffic on the existing road.

280. Given the very low levels of SO_2, NO_2, dust and CO measured in the Project area it is considered highly unlikely that the traffic volumes on the new road would contribute to significant degradation air quality in the project area. In addition to this, the quality of fuels and engine performance in the future is only likely to improve, which would further limit the impacts of air emissions from road traffic in the future.

E.1.6 Climate

281. The climate of the project area is strongly continental with long winters, stable snow cover, and comparatively short, moderately hot summer. The salient features are large yearly and daily fluctuations of air temperatures, late spring, and early autumn frosts, deep soil freezing, and permanently blowing winds. The average yearly temperature of the project area is +5.2 °C.

282. The new construction site of the Project by-pass of Alga is located in the zone of arid steppes with sharply continental climate, with significant fluctuations in the mean monthly and daily air temperatures, with a deficit of atmospheric precipitation and their uneven distribution throughout the year, with a hot dry summer and cold severe winter.

Table 27. Average long-term monthly and yearly ambient temperatures (data of reference meteorological station in Aktobe)

Month												Ave (°C)
1	2	3	4	5	6	7	8	9	10	11	12	
-12.1	-11.6	-5	5.7	14.8	19.8	22.3	20.2	13.5	4.4	-1.1	-8.5	5.2

283. The coldest month is January with average air temperatures – 12.1 °C. The hottest month is July with average air temperatures of 22.3 °C. The most rapid temperature increase is in April. During this time breakup of the ice and maximum surface water flows occur. The duration of no frost period is 140 days per year.

284. The average yearly wind velocity is 2.3 m/s. Maximum velocity of the dominant winds can reach 32 m/s. Prevailing winds during warm season is west and north west, in winter – south and south-east. Average number of no wind days is 8%. Number of windy days with velocities of more than 15 m/s is 56. Average yearly days with sandstorms is 16.

285. Precipitation is the major factor for groundwater supply. Yearly precipitation ranges from 102 to 387 mm with average annual precipitation 332.1 mm. Maximum precipitation is during warm season (April to October) with maximum in June/July. A second, less distinct maximum, is in October – November. February is the driest month.

Table 28. Average precipitation (data of reference meteorological station in Aktobe)

Month												Ave.
1	2	3	4	5	6	7	8	9	10	11	12	
23	19.1	23	21	29	33	36	35	25	20	36	32	332.1

286. Average precipitation is 332.1 mm including 199 mm during warm period (April to October), and 133.1 mm during cold period. Daily maximum is 58 mm. Low precipitation and

high temperatures cause lack of humidity. This result in very high evaporation from water surfaces. On average, long-term observations show 808 mm of cumulative evaporation from water surface of small water body. Summer precipitation evaporate almost completely.

287. Groundwater recharge by precipitation is majorly by snow melt and spring and autumn rains due to low transpiration and insignificant evaporation during this period. Notable part in moisturizing soil, nourishment of rivers, and groundwater recharge is played by snow cover.

288. The established snow cover is formed in the end of November and lasts until beginning of April. Number of days with snow cover is 135. Maximum thickness of snow cover by the end of winter season is 56-60 cm, and minimal is 2-10 cm. The average of maximum decade thicknesses is 26 cm. The snow cover in open areas is blown away by strong winds. The thickness of snow cover with estimated increase 5% is 32 cm. On average, 23 snowstorms are observed from October to April. In some years this figure reaches 50. Typical duration of snowstorms is 8-9 hours.

Climate Change

289. According to the World Bank climate change projections suggest an increase of the average expected mean annual temperature of 1.4°C by 2030, 2.7°C by 2050, and 4.6°C by 2085 in Kazakhstan. By mid-century, winter and spring precipitation is projected to increase by 9 % and 5 %, respectively which could lead to increased agricultural potential. The frequency of forest and steppe fires is expected to increase due to global warming. These fires could damage considerable areas of agricultural lands and also would have an indirect impact on population health by raising smoke concentrations in the air. Climate change is projected to significantly influence Kazakhstan's water resources, exacerbating existing water shortages and placing greater pressures on agricultural activity. However, any increased glacial melt is unlikely to lead to hydrological impacts to the Project due to its distance from the mountains. In terms of climate change impact, more extreme temperatures will add to road deterioration, which has already happened in Kazakhstan, where truck travel has to be limited on hot summer days when the asphalt softens. [11] There is a lack of reliable data, information and analysis on the impacts of climate change on the Caspian Basin, [12]particularly its impact on water level fluctuations and related social, environmental and economic consequences.

E.2 Ecological Resources

E.2.1 Flora

Regional Context

290. More than 6,000 species of vascular plants are found in Kazakhstan, along with 5,000 species of fungi, 485 species of lichens, 2,000 species of algae, and 500 species of bryophytes. Among the vascular plants, 14% are endemic to Kazakhstan.

291. The steppes in which Aktobe Oblast is located forms a broad band across northern Kazakhstan. Steppe ecosystems host more than 20 major plant formations. However, most steppes are either heavily ploughed or grazed. The dominant vegetation within the steppe consists of grasses, notably the various species of feather grasses, but also including vegetation is represented steppe grasses - mainly wormwood, fescues and wild oats.

[11] Kazakhstan – Overview of Climate Change Activities. October, 2013, World Bank.
[12] Caspian Sea State of the Environment, Report by the interim Secretariat of the Framework Convention for the Protection of the Marine Environment of the Caspian Sea and the Project Coordination Management Unit of the "CaspEco" project, 2011

Numerous herbaceous species are also present. Characteristic shrubs include Oleaster, Spiraea, Caragana, and wild cherry.

Local Context

292. The steppe zone occupies more than half of the territory of the Aktobe Oblast and encompasses the Poduralskoe and Torgai plateaus, the Mugalzhar massif. Due to the large extent from north to south, the steppe is divided into 4 subzones:

1. Arid - herbage-feather grass steppes on south chernozems;
2. Moderately dry - turf grasses on dark chestnut soils;
3. Dry - xerophytic-uneven-turf grass steppes on chestnut soils; and
4. Desert - wormwood-turf grass steppes on light chestnut soils.

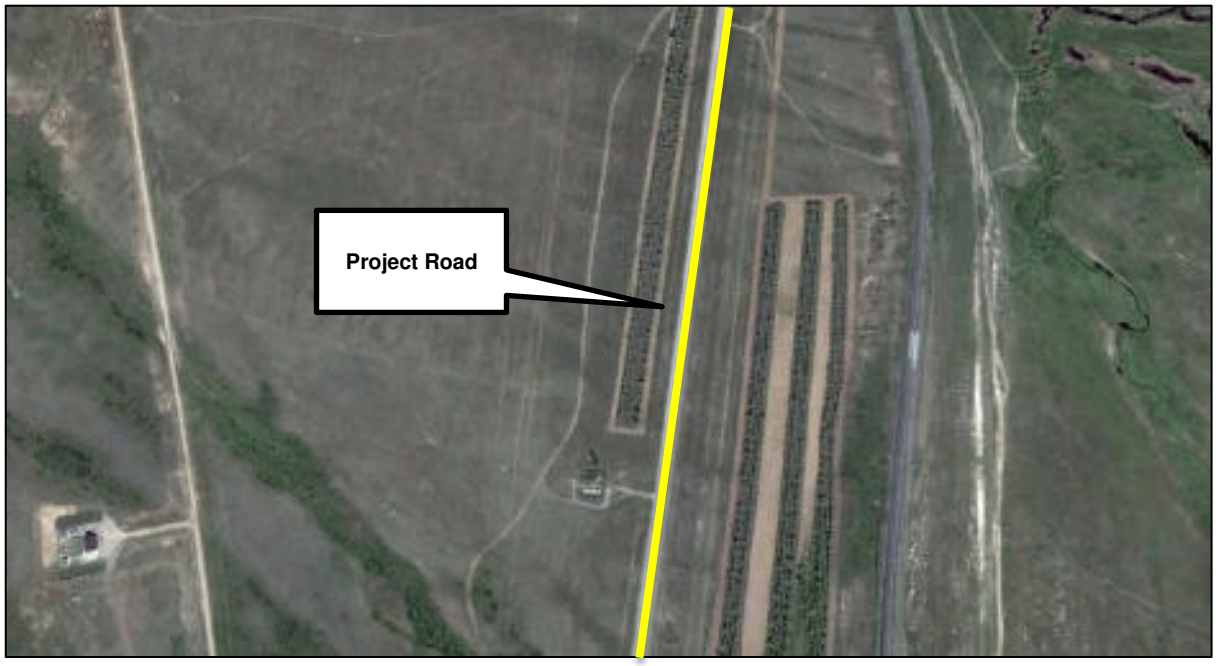
293. The project area includes vegetation of almost all subzones except the first one.

294. The vegetation cover of the moderately dry steppe is represented by feather-grass fescue, sagebrush, fescue-feather grass communities. Among herbage there are a lot of legumes - alfalfa, riches, Ural licorice, there are also weeds. The vegetative cover of the dry steppe is represented by fescue-feather grass, wormwood, fescue-wormwood communities with the predominance of fescue furrow (fescue). The vegetation cover of the desert steppe is represented by complexes formed by semi-shrub and steppe turf loam and rhizome plants. Dominants of steppe communities are fescue, typhic, tyrosa, feather grasses etc.

295. Within the Project area, Tugai (tree-shrub) can be seen on the Ilek river banks as well as shrubby forms *Salix caspica*, Silverberry (*Elaeagnus oxycarpa*), European Aspen (*Populus tremula*), Maple (*Acer tataricum*) Dwarf Cherry (*Cerasus fruticosa*) White and Gray Poplars (*Populus alba, P. canescens*) and sometimes Salt Cedar (*Tamarix ramosissima*). None of these species are listed as near threatened, endangered or critically endangered according to the IUCN red list.

296. Within the immediate vicinity of the Project road, i.e. within 25-50 meters very few trees can be observed. Mostly the road traverses open steppe and where trees can be observed they are mostly strips of planted species outside of the right of way that will not be impacted by Project works. Figure 17 provides an aerial image illustrating this point, the vegetation strips in this photo are more than 30 meters from the edge of the existing road.

Figure 17: Aerial Image of Planted Strips of Vegetation (approximately KM 54)



E.2.2 Fauna

Regional Context

297. The fauna of Kazakhstan includes 178 species of mammals, 489 species of birds and 117 species of fish. An estimated 6,000 species of vascular plants are found in Kazakhstan. This high biodiversity results from the combination of faunas and floras of different bio-geographical origins. The diverse and threatened large mammal fauna includes Saiga antelope, wild sheep and goats, and their predators, including wolf and snow leopard. Populations of vulnerable species — such as Saiga, Caspian seal, Caspian sturgeon, and migratory birds — undertake large-scale annual movements that increase their exposure to risks from anthropogenic and climatic factors.

Project Context

298. General - Wildlife along the Project road corridor is typical for a steppe-desert ecosystem. Among mammals, the most common species are rodents such as ground squirrels, hamsters, voles, rabbits, and jerboa.

299. *Reptiles* that potentially can be found in the Project area include the Central Asian turtle, the squeaky, gray and Caspian geckos, the steppe agama, the fast lizard, sand and east boa and snake arrow. The most common are the multicolored lizard, the fast lizard, the eared round head and the round-head-tail.

300. More than 95 species of birds are found in open steppe areas, of which at least 25 breeds. The most numerous are larks, pipit (*Anthus*), common chat (*Oenanthe oenanthe*), Isabelline chat (*Oenanthe isabellina*). Occasionally, the demoiselle crane (*Anthropoides virgo*) nestles here, the steppe eagle (*Aquila rapax*), the common partridge (*Perdix perdix*), the quail (*Coturnix*), the sociable lapwing (*Vanellus gregarius*), the red-headed bunting (*Emberiza bruniceps*), the whitethroat (*Sylvia communis*) and others.

301. Among bird species, 16 species refer to rare or endangered species listed in the Red Book of Kazakhstan. During migration, the number of bird species increases.

302. The main migration routes of waterfowl and waterbirds are in the floodplains of the rivers Ilek, Gem, Irgiz-Torgai. Birds can live here until the end of May - mid June, depending on the water cut. During the migrations (April-May, late August-October), the number of birds increases to 70-100 birds / km, both typical inhabitants of deserts, and birds of arboreal and shrub plantations and water birds (especially in the spring period).

303. The Aktobe region belongs to two fishing areas: the western part of the region belongs to the Ural-Caspian region (project road area), the eastern part - to the Irgiz-Torgai region of the Aral region. The fish resources of large rivers, ponds and reservoirs is mainly represented by commercial species. Despite the abundance of commercial fish species (at least 19 species), their fishery value is small.

304. Within the Ilek river the following species can be found:

- Common Bream (*Abramis brama*) – IUCN Status: Least Concern
- Crucian Carp (*Carassius*)
- Tench (*Tinca tinca*) – IUCN Status: Least Concern
- **Carp (*Cyprinus carpio*) - IUCN Status: Vulnerable**
- Pike Perch (*Stizostedion*) – IUCN Status: Least Concern
- Pike (*Esox*) – IUCN Status: Least Concern
- Ide (*Leuciscus idus*) – IUCN Status: Least Concern
- Common Nase (*Chondrostoma nasus*) – IUCN Status: Least Concern

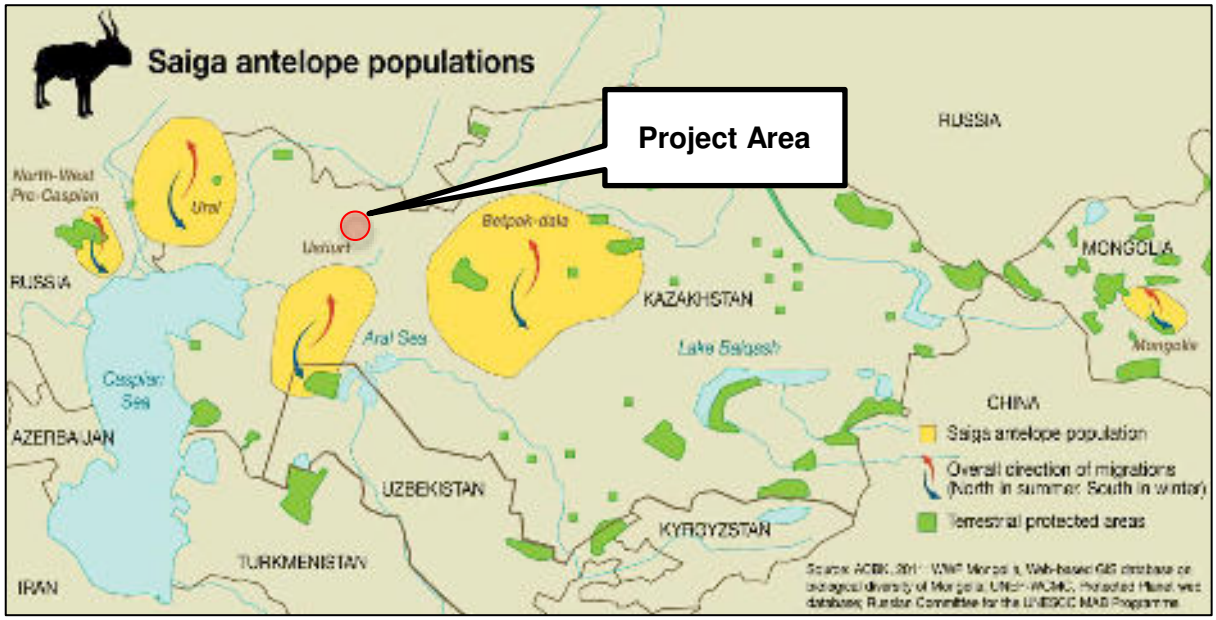
- Perch (*Perca schrenkii)*
- Common Roach (*Rutilus rutilus)*

305. At the site of the proposed work on the Ilek river there are no spawning grounds or other places of expressed concentration of fish and juveniles. There are no rare and " Kazakh Red Book" fish species or any fish species from the Ural river.

306. Other Notable Species - Historical migratory corridors of the Ustyurt population of Saiga exist in Aktobe Oblast. Saiga Antelope are classified by the IUCN as a critically endangered species (CR) and undertake long distance movements along a north - south axis within large, loosely defined ranges within Kazakhstan and Uzbekistan (see Figure 18). In 2011, the number of Saiga in the northern parts of Aktobe Oblast totaled 109 species but the Aktobe Territorial Inspection for Forestry and Wildlife reports that no single animal in was registered in recent years.

307. In addition, studies funded by USAID and Flora and Fauna International in 2010 [13] indicate that Ustyurt Saiga are not found within the Project corridor – and this was confirmed by the Aktobe Territorial Inspection for Forestry and Wildlife.

Figure 18: Approximate range of the Ustyurt, Ural and Betpak-Dala Saiga populations in Kazakhstan.



E.2.3 Protected Areas and IBAs

161. There are no protected areas or Important Bird Areas (IBAs) within 100 km of the Project road as noted by Figure 19.

[13] Guidelines and Recommendations to Mitigate Barrier Effects of Border Fencing and Railroad Corridors on Saiga Antelope in Kazakhstan. Olsson, 2010.

Figure 19: Protected Areas of Kazakhstan

E.3 Economic Development

E.3.1 Industries & Agriculture

163. Aktobe oblast has a unique mineral resource base. The main types of minerals are chrome, oil, petroleum flare gas, brown coal, nickel, marble, copper ore, chromite, phosphate rock, sand and gravel, brick clay, gypsum, limestone to lime. Aktobe oblast occupies the leading place in the world in terms of chromium (Chromtau District, South Kempirsay ore district) and is the only region in the Republic of Kazakhstan, where he covers the development of nickel deposits (Kempirsay group, the main industrial components in ore, nickel and associated cobalt). Around 10% of proven and probable reserves of 30% of hydrocarbons in Kazakhstan are concentrated in Aktobe oblast, mainly in Mugalzhar district, Temir and Baygany areas. The largest deposits include Zhanazhol and Kenkiyak. There are reserves of brown coal, providing most of the domestic demand for raw materials and energy in the Kargaly area. The region has been explored more than a hundred fields of common minerals, most of which are located in Chromtau (24%) and Mugalzhar (18%) regions, as well as in Aktobe (21%). No mineral resources or industry of note was observed within the Project area.

E.3.2 Infrastructure and Transportation facilities

165. Low voltage electricity distribution lines and gas pipelines are present within the settlements through which the Project road passes. The Project corridor also broadly follows the railway line connecting Aktau, Atyrau and Aktobe. The Project road crosses the railway to the south of Alga and as such an overpass of the railway is required as described in **Section B**.

E.3.3 Land use

308. The prevailing land-use in the project area is cattle grazing (mostly horse and sheep grazing) because of the vastness of desert and steppe terrain. Crop and vegetable production is less prevalent in the Project area although patches of agricultural land can be noted along the Project corridor. Table 29 provides a summary of agricultural output in Alga and Mugalzhar rayons in the Project area.

Table 29: Total Agricultural Output in the Project Area, 2014

Project Area	Livestock breeding, head				Crop/vegetable production, tons			
	cows	sheep/goats	horses	camels	grain & legume	vegetables	melons &squash	potatoes
Alga rayon	41,667	130,307	6,444	286	310.6	1,113.8	515	903.2
Mugalzhar rayon	32,247	116,085	7,293	3,288	-	352.4	68.3	172.5

Source: Aktobe and Atyrau Oblast Departments of Statistics, 2014

309. Other land uses in the Project area are residential / commercial, e.g. the towns and villages along the alignment, and also some heavy industrial activities, such a the Chemical Plant in Alga.

E.4 Social and Cultural Resources

E.4.1 Population and communities

310. Aktobe oblast is the second largest oblast in Kazakhstan (after Karaganda oblast) occupying 300,600 km^2, or 11% of the country's territory. The Aktobe oblast includes the city of Aktobe, 12 rayon's, 4 small towns, 140 rural okrugs and 419 rural settlements. Total population of the Aktobe oblast as of January 1, 2015 was estimated at 822,522 residents with 62% (or 510,568) living in urban areas and 38% (or 311,944) in rural areas[14].

E.4.2 Health & Education facilities

311. Education is universal in Kazakhstan and mandatory through to the secondary level, and the adult literacy rate is 99.5%.[15] The school system is well developed and diversified in both target regions, ranging from pre-schools/kindergarten and primary schools to secondary school types. Higher education facilities include universities (7) and colleges (37). The majority of all higher education opportunities are concentrated in Aktobe. No schools, hospitals or clinics were noted within 100 meters of the RoW.

E.4.3 Socio-economic conditions

Economy

312. In terms of the economically active population, the statistical data show that the majority of people in Aktobe oblast are employed in the industrial sector, mainly oil and mining (73%), public sector and general service (retail) sector. The self-employed proportion of the population account for about 27%.

313. Within the Project area main the main sources of employment include the oil & gas industries, cattle breeding, retail business (mostly small shop-keeping) and the public sector (rayon and village akimat administrations). The registered unemployment rate in the project rayons as of July 2015 is rather lower, about 0.2%.

[14] Committee on Statistics of the Ministry of National Economy (2015); www.stat.gov.kz
[15] http://www.collegeatlas.org/kazakhstan-colleges-universities.html

Table 30: Small & Medium-Size Enterprises in the Project Area, 2015

Project Area	Total no of registered SMEs	Including			Total no of operational SMEs	Including		
		Legal entity	Individual entrepreneur	Agr. farm		Legal entity	Individual entrepreneur	Agricultural farms
Aktobe section (11-100 km)								
Alga rayon	1 648	65	1 298	285	1 613	51	1 277	285
Mugalzhar rayon	*1 222*	31	920	271	1 168	20	880	268

Source: Social and Economic Development of Atyrau Oblast. Atyrau Oblast Department of Statistics (July 2015). Social and Economic Development of Aktobe Oblast. Aktobe Oblast Department of Statistics (July 2015).

Ethnic Groups

314. Of total population, Kazakhs represent 80%, Russians - 12.5% and other ethnic groups include Ukrainians, Tatars, Germans, Koreans, Chechens, Belorussians, Azeri, Uzbeks, and other minorities.

Languages

315. Kazakhstan is officially a bilingual country: Kazakh language spoken natively by 64.4% of the population has the status of "state" language, whereas Russian, which is spoken by most Kazakhstanis, is declared an "official" language, and is used routinely in business, government, and inter-ethnic communication. Other minority languages spoken in Kazakhstan include Uzbek, Ukrainian, Uyghur, Kyrgyz, and Tatar.[16]

Religion

316. According to its Constitution, Kazakhstan is a secular state. Religious freedoms are guaranteed by Article 39 of Kazakhstan's Constitution. Article 39 states: "Human rights and freedoms shall not be restricted in any way". According to the 2009 Census, 70% of the population is Muslim, 26% Christian, 0.1% Buddhists, 0.2% others (mostly Jews, and 3% Irreligious.[17]

E.4.4 Physical and Cultural Resources

317. Within the Project corridor a number of cemeteries, mosques and other cultural resources can be noted, as listed in Table 31. The distances from the existing road are noted.

Table 31: PCR in the Project Area

#	Item	Approximate Chainage	Distance from existing road (m)
1	Cemetery	25	100
2	Mosque	28	20
3	Memorial	30	75
4	Cemetery	37	50m
5	Cemetery	54	40m
6	Cemetery	62	30m
7	Cemetery	71	20 meters

[16] http://www.inform.kz/eng/article/2741711
[17] Results of the national population census of 2009. Agency of Statistics of the Republic of Kazakhstan. 2010. Retrieved from stat.gov.kz on July 20, 2015.

Figure 20: Cemetery, KM74

Figure 21: Memorial, KM30

E.4.5 Noise

318. Noise levels within the existing project corridor are dominated by noise from road traffic. Noise from the relatively infrequent train movements on the railway line is insignificant due to its distance from the road. No significant point sources of noise are present within the Project corridor.

319. Most of the Project road avoids residential areas, except for the portion which runs through Bestamak. Here residential and commercial properties line the road, although in general most homes and commercial properties are located more than 20 meters from the

edge of the existing road (see Figure 22: Bestamak) and also have some element of noise protection via fencing and walls that can be seen around nearly all properties within this part of Bestamak (see Figure 23).

320. Baseline noise monitoring has been undertaken at four locations within the Project corridor during September 2018. The locations chosen for monitoring, which are shown in **Appendix F**, are the only areas within the Project corridor which may be impacted by elevated noise levels during the construction and operational phases of the Project:

- KM 0.2
- Bestamak, KM 27
- Bestamak, KM 28
- Tamdy, KM 57

321. A national company was hired to undertake the monitoring according to IFC standards. The scope of works for the monitoring is provided as **Appendix F**.

322. The results of the monitoring provided below (and shown in full by **Appendix G**) show that noise levels are very consistent in the urban areas and are nearly always below IFC guideline limits for daytime and nightime noise with the exception of the nightime periods between ten and eleven (shown in red cells), but even in these cases the noise limits are only slightly exceeded.

Figure 22: Bestamak

Figure 23: Fencing Around all Properties in Bestamak

Table 32: Baseline Noise Monitoring Data

Time	Received data, dBA				IFC Standard dBA
	KM 0.2	KM 27	KM 28	KM 57	
01:00	44,0	44,0	42,0	43,0	45
02:00	42,0	42,0	41,0	42,0	
03:00	38,0	40,0	40,0	40,0	
04:00	38,0	38,0	38,0	38,0	
05:00	39,0	39,0	38,0	39,0	
06:00	41,0	41,0	43,0	42,0	
07:00	43,0	44,0	44,0	44,0	
08:00	47,0	48,0	49,0	48,0	55
09:00	49,0	50,0	50,0	53,0	
10:00	49,0	51,0	51,0	51,0	
11:00	50,0	49,0	51,0	50,0	
12:00	52,0	50,0	52,0	52,0	
13:00	52,0	53,0	53,0	53,0	
14:00	51,0	50,0	53,0	51,0	
15:00	50,0	49,0	52,0	53,0	
16:00	50,0	53,0	50,0	54,0	
17:00	51,0	50,0	51,0	51,0	
18:00	53,0	52,0	52,0	50,0	
19:00	53,0	53,0	54,0	54,0	
20:00	50,0	54,0	52,0	52,0	
21:00	48,0	52,0	49,0	50,0	
22:00	46,0	50,0	47,0	48,0	45
23:00	45,0	48,0	46,0	46,0	
00:00	42,0	43,0	41,0	43,0	

F. Environmental Impacts and Mitigation Measures

F.1 Introduction

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

- Physical Resources
  - Air quality & Climate Change
  - Topography
  - Soils
  - Hydrology
  - Geology & Sesmicity
- Ecological Resources
  - Flora
  - Fauna
  - Forests & Protected areas
- Economic Development
  - Industries
  - Infrastructure & Transportation Facilities
  - Land use
  - Waste Management
- Social and Cultural Resources
  - Population and communities
  - Health & Education
  - Socio-economic conditions
  - Physical and Cultural Resources
  - Noise

F.2 Impact Phases

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

- Feasibility / Design Phase, or the Pre-construction Phase
- Construction Phase
- Operation Phase

F.3 Types of Impacts

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

- Direct Impacts - i.e., those directly due to the Project itself such as the impacts to air quality resulting from construction activities, equipment and vehicles. Direct impacts also include the impact of construction expenditures in the local economy.
- Indirect Impacts - i.e., those resulting from activities prompted by the Project, but not directly attributable to it. The use of rock and other construction materials, for example, has an indirect impact of increasing the demand for these materials.
- Cumulative Impacts - i.e., impacts in conjunction with other activities. A single road improvement may not exert a significant environmental impact, but if several roads are

developed in the same area developing a road network the cumulative or additive effect could be more significant.

326. Impacts in all three categories may be either:

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

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

F.4 Mitigation Aspects

328. Mitigation is recommended through strategic avoidance combined with construction and monitoring. Bid and contract documents are recommended to specify that a Specific EMP (SEMP) shall be required. The Contractor shall ensure that the SEMP is submitted to the Engineer for review at least 30 days before taking possession of any work site. No access to the site will be allowed until the SEMP is reviewed and approved by the Engineer.

F.5 Summary of Impacts

329. Table 33 provides a summary of the potential Project impacts that are discussed in detail under **Sections F.6** to **F.10**.

Table 33: Summary Impact Table

	Physical Characteristic						**Biological Characteristic**			**Socio-economic Characteristic**								
	Geology	Topography	Soils	Climate and Air Quality	Hydrology	Natural Hazards	Flora	Fauna	Protected Areas	Infrastructure	Land Use	Waste Management	Community Structure/ access	Socio-economic	Health & Safety	Educational Facilities	Cultural Heritage	Noise
Alignment Changes			D/S		D/S		D/S	D/S			D/L			D/L	D/L			D/S
Diversions				D/S									D/S		D/S	D/S		D/S
Animal Crossings								D/L						D/L	D/L			
Land Acquisition											D/L			D\L				
Borrow Pits	D/L		D/S	D/S						D/S					D/S			D/L
Asphalt Plant / Concrete Batching Plant			D/S	D/S	D/S		D/S					D/S			D/S			D/S
Construction Camp			D/S	D/S	D/S		D/S					D/S		D/S				D/S
Storage Areas			D/S	D/S	D/S		D/S					D/S			D/S			D/S
Haul Routes			D/S	D/S						D/S					D/S			D/S
Site Clearance			D/S	D/S	D/S		D/S	D/S		D/S	D/S	D/S	D/S		D/S			D/S
Pavement construction			D/S	D/S	D/S		D/S			D/S		D/S	D/S		D/S			D/S
Bridge construction			D/S	D/S	D/L		D/S	D/S				D/S	D/S		D/S			D/S
Culverts			D/S	D/S	D/L							D/S	D/S		D/S			D/S
Earthworks	D/S		D/S	D/S			D/S	D/S		D/S	D/S	D/S	D/S		D/S			D/S
Noise Barriers													D/L	D/L	D/L			D/L
Relocation of Services										D/L				D/S				
Increased traffic				D/L										D/L	D/L			D/L

D = Direct Impact / I = Indirect Impact

S = Short-term Impact (construction phase) / L= Long term Impact

	Potential Positive Impact
	Potential Low/Medium Impact
	Potential High Impact

F.6 Physical Resources

F.6.1 Air Quality

Potential Air Quality Impacts

330. The potential impacts of the Project to air quality are described as follows:

Design and Pre-construction Phase

331. The road rehabilitation works are generally intermittent and not permanent in a specific site, the works move along the Project road as work progresses and as such air quality impacts will be short term in specific locations. However, fugitive emissions will be emitted on a longer-term basis from stationary sources such as asphalt plants. These sites can however be selected prior to construction and be placed in an area where it can cause the least impact on human and ecologic receptors.

Construction Phase

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

(i) Exhaust emissions from the operation of construction machinery (e.g. Nitrogen Oxides (NO_X), Sulfur Oxides (SO_X) and Carbon Monoxide (CO));
(ii) Open burning of waste materials; and
(iii) Dust generated from haul roads, unpaved roads, exposed soils and material stock-piles.

333. Dust is the major air quality problem from construction sites. Dust is a problem for a variety of reasons, as outlined below:

(i) Inconvenience to local people. For example, people may have to re-wash laundry that has been put outdoors to dry, and wash windows, curtains and vehicles. Dust can contaminate meat hanging up in open-air butchers and other food that is exposed to it in homes, shops and open-air restaurants, giving food a gritty texture.
(ii) Health and safety problems. Dust may affect health by irritating eyes and worsening the health of people with asthma. Dust can reduce visibility for drivers on roads. It can also be blown for long distances by the wind.
(iii) Crop damage. Even low concentrations of dust can affect plant and fruit growth as far away as one kilometer from a construction site. Plant growth is particularly susceptible to dusts that are highly alkaline, for example limestone and cement dust. Dust deposited during light rainfall can cause the soil surface to form a crust increasing run-off.
(iv) Impact on ecology. Dust blowing onto watercourses may damage ecology by increasing sedimentation, reducing sunlight and suffocating fish. It may also affect plant growth and change the species of plants growing in an area. Dust may also damage trees and other vegetation planted as part of the construction contract.
(v) Damage to plant and equipment. Within the construction site, dust can cause mechanical or electrical problems in sensitive equipment such as computers. It can also increase abrasion of moving parts in equipment and clogging of air filters.

334. However, the road rehabilitation works associated with the Project are generally intermittent and not permanent in a specific site, the works move along the Project road as work progresses and as such air quality impacts will be short term in specific locations. In addition, more than 90 % of the

Project road is located in uninhabited rural areas with little or no agricultural land, thereby limiting the impacts of air pollution during the construction phase to populated areas, specifically Bestamak and KM0.0 – KM0.5.

335. Fugitive emissions will be emitted on a longer-term basis from stationary sources such as quarries, borrow pits and asphalt plants. These sites can however be selected and be placed in an area where it can cause the least impact on human and ecologic receptors.

Operational Phase

336. The main source of air pollution during the operational phase will be vehicles moving on the highway. The main pollutants are: CO; NO_X; hydrocarbons (HC); SO_2; carbon dioxide (CO_2); and particulate matter (PM).

337. Some of these compounds can damage health and/or the environment. The concentration of pollutants generated by vehicles depends on factors such as the number, type and speed of vehicles. The effect of air pollution on local people depends on the distance between them and the road, wind direction, topography and other factors. The main direct effects are in the area closest to the road as the rapid dispersion and dilution of exhaust gases quickly reduces their concentrations to levels at which risks are minimal. However, given the relatively low population levels within Project corridor, it is unlikely that increased traffic volumes will have significant impacts to residents health in terms of NOx, CO and PAH pollution.

338. In addition, once completed, current high levels of PM in areas where the road condition is poor will be reduced. Improved vehicle performance on a new better road surface will also serve to alleviate potential air pollution levels to a modest degree.

339. Inclusion of the proposed bypasses around Alga and Kandyagash will also have beneficial impacts to these towns in terms of air quality as the volume of traffic flowing through the center of these towns will significantly decrease (including heavy goods vehicles which often produce higher levels of emissions).

Management & Mitigation Actions

Pre-construction Phase

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

341. Locations for rock crushing facilities, concrete batching yards and asphalt plants will require approval from the Engineer, MoEPA and the RD during the Pre-construction phase. Efforts will be made to ensure that these facilities are as near to the Project road as practical to avoid unnecessary journeys and potential dust issues from vehicle movements during construction works on unpaved roads in urban areas. Haul routes will be prepared and submitted to the Engineer as part of his ***Traffic Management Plan*** (TMP).

342. To prevent impacts arising from asphalt plants, construction camps, batching plants and rock crushing plants, they will be prohibited within 1km of any residential building or sensitive receptor (school, hospital, etc.). The locations of these facilities will be indicated within the Contractors site plans which shall prepared for each of the areas mentioned above as part of the SEMP. Baseline air quality monitoring will also be undertaken by the Contractor during the pre-construction phase as described below under recommended monitoring. Where practical, they should also be located as far away from any agricultural plots as possible.

343. The Contractor is also responsible for the preparation of a ***Health and Safety Plan***. The Plan, required as part of the SEMP, will include measures to protect workers from dust impacts, e.g. around rock crushing plant, concrete batching plant and also in the works areas around Alga and the Alga Chemical Plant.

Construction Phase

344. The Contractor will be responsible, through compliance with this EMP and his SEMP, for the following;

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

(ii) Open burning of waste materials - No burning of debris or other materials will occur on the Site.

(iii) Dust from contaminated soils – although contaminated soils from the Alga chemical plant are not likely to be found within the Alga bypass area, it is possible that they could be present close to the existing road which will be rehabilitated in Alga. During the course of Project works dust could be generated as the pavement is rehabilitated. It is therefore recommended that all workers at work sites within 1km of the Alga chemical plant are given face masks to limit the amount of dust inhaled during the excavation of the pavement in this area.

(iv) Dust generated from haul roads, unpaved roads, material stock piles, etc:
   (a) The Contractor will ensure and that material stockpiles will be located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne.
   (b) All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which will be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s).
   (c) Hard surfaces will be required in construction areas with regular movements of vehicles.
   (d) Effective use of water sprays will be implemented (e.g., Carry out watering for dust control at least 3 times a day: in the morning, at noon, and in the afternoon during dry weather with temperatures of over 25°C, or in windy weather. Avoid overwatering as this may make the surrounding muddy). All water used for controlling dust will be free of odor and pollution.
   (e) Earthwork operation to be suspended when the wind speed exceeds 20 km/h in areas within 500 m of any community.

345. Emissions from on-road and off-road vehicles should comply with national or regional programs. In the absence of these, the following should be considered:

(i) Regardless of the size or type of vehicle, owners / operators should implement the manufacturer recommended engine maintenance programmes.

(ii) Drivers should be instructed on the benefits of driving practices that reduced both the risk of accidents and fuel consumption, including measured acceleration and driving within safe speed limits.
(iii) Implement a regular vehicle maintenance and repair program.

Residual Impact Significance

Construction Phase – ***MINOR***

If the mitigation measures suggested are implemented, the residual impacts of the Project will be minor.

Operational Phase – ***LOW***

Air quality during the operational phase will not be significantly impacted by the Project road.

F.6.2 Climate Change

Potential Impacts Caused by the Project

346. Greenhouse Gas (GHGs) Emissions – The Greenhouse Gas (GHG) emissions resulting from road construction have been estimated to be 2.14 ktCO2/km for a 26m wide road (26m is used as an average for the Project road). Including operational and maintenance issues over a 40 year period this figure rises to 3.94 ktCO2/km. Given a road length of 89 km, this would result in 354,600 tCO2 of GHG emissions from the construction and O&M phases of the Project over a 40 year period, or 8,865 tCO2 per year.

Table 34: Estimated Energy Consumption, CO_2 Emissions and GHG Emissions for a Concrete Pavement 13 m wide.

Phase	Energy Consumption, TJ/km (26m pavement)	CO_2 Emissions $ktCO_2$/km (26m pavement)	All GHG Emissions $ktCO_2$/km (26m pavement)
Construction	11.51 (23.02)	1.00 (2.00)	1.07 (2.14)
Maintenance – 40 years	2.99 (5.98)	0.19 (0.38)	0.20 (0.40)
Operation – 40 years	12.60 (25.20)	0.66 (1.32)	0.70 (1.40)
Total	27.09 (54.18)	1.85 (3.70)	1.97 (3.94)

Methodology based on IEA ETSAP – Technology Brief T14 –August 2011

347. GHG emissions from traffic using the road have been calculated using the traffic forecasts presented in **Section B**. The existing road traffic is estimated to generate around 107 tons of CO_2 per day by 2023, or around 39,300 tons of CO_2 per annum. This will rise to 188 tons of CO_2 per day by 2035, or around 68,700 tons of CO_2 per annum. This figure is below the 100,000 tons of CO_2 per annum required for reporting CO_2 emissions per the ADB SPS (2009).

Potential Impacts Upon the Project

348. A Climate Change Risk Assessment was prepared by the ADB as part of the Aktobe – Makat Road Rehabilitation IEE (2015). This document identified the following potential issues and risks which are also relevant to this Project:

1. Change in Temperature:
    a. Potential deterioration of pavement integrity, such as softening, traffic-related rutting, and migration of liquid asphalt due to increase in temperature (potentially by 4.6 degrees Celsius by 2085 – however, this is far beyond the 20 year lifecycle of the Project).
    b. Potential corrosion of steel reinforcements in concrete structures due to increase in surface salt levels in some locations resulting from increased evaporation due to increased temperatures.
    c. Potential for reduced pavement deterioration from less exposure to freezing, snow, and ice. Warmer winters could result in reductions in snow and ice removal costs, extend the construction season and improve the mobility/safety of passenger and freight.
2. Change in precipitation levels:
    a. Damage to roads and drainage systems due to flooding - more frequent as well as intense and heavy precipitation events can cause immediate damages, undermine road structural integrity, affect the maintenance of roads, bridges and drainage systems.
    b. Increases in heavy precipitation events/floods will also cause more weather-related accidents due to vehicle and road damages and poor visibility, delays, and traffic disruptions. However, embankments heights are being reduced to limit fatalities and serious injuries caused when vehicles roll off the road.
    c. Increase in scouring of roads, bridges, and support structures.
    d. Damage to infrastructure due to increased susceptibility to wildfires.

Mitigation and Management Actions

Design / Pre-construction

349. The following assessments associated with potential climate changes should be undertaken by the designers during the design stage of the Project:

- *Deterioration of pavement integrity* – Assessment should be undertaken to determine if a potential change in temperature of 5°C will require adaption of pavement design (e.g. change in the asphalt binder or in mineral aggregate).
- *Corrosion of steel reinforcements in concrete structures* – Assess if the use of Advanced concrete materials and structures will help improve the durability of concrete infrastructure and their adaptation to climate change
- *Damage to roads and drainage systems due to flooding* – Assessment of 1/50 year flood return period for all bridges and roads embankment and recommend measures to mitigate the flood risks of all planned project roads. Increase capacity of side and cross drains to accommodate more intense floods.
- *Increase in scouring of roads, bridges, and support structures* – Assess designs of piers, abutments and embankments to determine if protection methods (e.g. rip-rap) are required to cope with additional water volumes and increased flow intensity.

Residual Impact Significance

Construction Phase – ***MINOR***

Operational Phase – ***LOW/MEDIUM***

Residual impacts from the generation of GHGs will remain throughout the lifecycle of the Project. This is an unavoidable consequence of the Project, but more fuel efficient cars may, in the future lead to a decrease in the emissions generated on the Project road.

In addition, consideration of the issues described above by the designers should limit the potential impacts of climate change on the Project in the future.

F.6.3 Soils

Potential Impacts

350. Potential impacts to soils include:

(i) Loss of Topsoil - Several impacts to topsoil may occur during the construction phase, including; removal of top soil for construction outside the ROW (e.g. for construction camps); compaction of topsoil (e.g. for the preparation of temporary access roads); loss of top soil by wind and water erosion and covering of top soil by project works.
(ii) Erosion - It is possible, that without adequate protection measures soil erosion could occur on road embankments and bridge embankments. It is also possible, that stockpiles of soil located close to surface waters could infiltrate the water courses during heavy rainfall and cause siltation of the rivers.
(iii) Borrow Pits – Opening and operating of borrow pits can result in multiple environmental and social impacts, including degradation of production soils, flora and habitat, impacts to air quality, elevated noise levels, etc. The Designers have already identified existing and potential borrow pits (see **Section B.6.1 – Borrow Pits and Quarries**). However, the Contractor shall make the final decisions on the borrow pits that he wished to use.
(iv) Induced Changes - It is possible that construction of the new road could induce development along the corridor to some extent, however land use planning and the procedures for permitting of new developments along the corridor is largely beyond the scope of this project.
(v) Contamination Due to Spills or Hazardous Materials - Potential soil contamination is a possibility resulting from poorly managed fuels, oils and other hazardous liquids used during the project works.

351. In addition, as noted above, contaminated soils are known to be present at the Alga chemical plant and potentially in other areas of Alga. The Project road includes the bypass of Alga 3km to the east of the town and the chemical plant and its associated tailing ponds and as such contaminated soils are not anticipated to be present in the area of the bypass.

352. The rehabilitation of the existing road through Alga, which is closer to the chemical plant and tailing ponds, involves the removal of the existing layer of asphalt and the relaying of a new layer of asphalt within the existing pavement area. No soils around the existing road will be excavated and as such no contaminated soils are expected to be excavated that would require special conditions for their handling, storage and disposal. However, the dust may present some occupational health and safety impacts which are discussed in more detail below under **Section F.9.3 – Workers Rights and Occupational Health and Safety**.

Management & Mitigation Actions

<u>Design / Pre-construction</u>

353. The Contractor will be responsible for preparation of a ***Spill Response Plan*** which will cover measures for the management of accidental spills and leaks of hazardous liquids at all camps and work sites and measures to dispose of any contaminated soils. The plan will be submitted to the Engineer for approval. Implementation of the plan will be monitored by the Engineer. Any spills and leaks, and how they were handled, will be reported in monthly progress reports by the Contractor to the Engineer. The Engineer will also provide periodic monitoring of the Contractors works throughout construction to ensure the plan is implemented effectively.

354. As part of the Contractors ***Construction Camp Site and Management Plan*** he shall provide details of how hazardous materials and liquids will be stored and managed at the camp site.

Construction Phase

355. Potential adverse impacts will be avoided or otherwise mitigated by ensuring the Contractor complies with the following:

- Borrow Pits. For existing borrow pits a due diligence review will be carried out by the Engineer to confirm that those sites identified for use by the Contractor are indeed operating or operable in an appropriate manner. This will include review of the borrow pits operational license. The license should clearly show the validity of the operational period of the borrow pit. A copy of the agreement between the operator and the Contractor should also be provided to the Engineer. If the Contractor intends to open a new borrow pit they will require approval from a range of local government institutions including an inter-regional committee of the Oblast. An OVOS will need to be prepared by consultants for the owner/operator (the Contractor). In addition, for any new borrow pit to be operated by the Contractor, the Contractor will be responsible for the preparation of a Borrow Pit Action Plan (BAP). The BAP will be submitted to the Engineer prior to the start of construction. The plan will identify the locations of all proposed borrow pits which will also be approved by both the Engineer and representatives of the Department of ecology of Aktobe. The plan shall ensure that:
  - Pit restoration will follow the completion of works in full compliance all applicable standards and specifications.
  - Arrangements for opening and using material borrow pits will contain enforceable provisions.
  - The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Engineer will be required before final acceptance and payment under the terms of contracts.
  - Additional borrow pits will not be opened without the restoration of those areas no longer in use.

  The total approval process for a new borrow pit through the Oblast and Rayon can be lengthy, as such the Contractor is recommended to use existing borrow pits with the existing approvals rather than try to use new sites for the extraction of material.
- Erosion - During construction, the Contractor will be responsible for ensuring material that is less susceptible to erosion will be selected for placement around bridges and culverts. In addition, he will ensure re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local grasses and shrubs; (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth. The Engineer and the Contractor will both be responsible for ensuring that embankments are monitored continuously during construction for signs of erosion. These actions and activities will be included in the Contractors Clearance, Re-vegetation and Restoration Management Plan.
- Topsoil – To reduce impacts to topsoil the following measures will be employed by the Contractor; locate topsoil stockpiles outside drainage lines and protect stockpiles from erosion; construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of

topsoil; rip ground surface prior to the spreading of topsoil; and remove unwanted materials from topsoil such as roots of trees, rubble and waste etc. Specifically regarding soil compaction, the Contractor will confine operation of heavy equipment within the ROW, as much as possible, to avoid soil compaction and damage to privately owned land. If in case private lands are disturbed, the contractor should promptly inform the owner and agree on the ways to remedy the situation.

- Conversion of Agricultural Soils Due to Indirect/Induced Impacts. Although the EMP contains provisions controlling direct impacts of land takings for both the road and ancillary functions (asphalt plants, construction camps, etc.), control of the induced impacts is largely beyond the scope of the Project.
- Contamination Due to Spills or Hazardous Materials. The Contractor, with oversight from the Engineer, will ensure that:
    - All fuel and chemical storage (if any) will be sited on an impervious base within a bund and secured by fencing. The storage area will be located away from any watercourse or wetlands. The base and bund walls will be impermeable and of sufficient capacity to contain 110% of the volume of tank (or one tank if more than one tank is located in the bund).
    - The construction camp maintenance yard will be constructed on impervious hardstanding with adequate drainage to collect spills, there will be no vehicle maintenance activities on open ground.
    - Filling and refueling will be strictly controlled and subject to formal procedures. Drip pans will be placed under all filling and fueling areas. Waste oils will be stored and disposed of by a licensed contractor.
    - All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.
    - The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any soils.
    - No bitumen drums or containers, full or used, will be stored on open ground. They will only be stored on impervious hardstanding.
    - Areas using bitumen will be constructed on impervious hardstanding to prevent seepage of oils into the soils.

Residual Impact Significance

Construction Phase – ***MINOR***

If the mitigation measures suggested are implemented, the residual impacts of the Project will be minor.

Operational Phase – ***LOW***

The erosion protection measures outlined above will prevent impacts occurring into the operational phase of the Project.

F.6.4 Hydrology

Potential Impacts

Pre-construction Phase

356. The following potential impacts to hydrological conditions exist within the Project corridor:

(i) Drainage & Flooding - Inadequate assessment of the hydrological conditions in the Project Area and poor design could result in damage to Project structures, including bridges and culverts. This in turn would result in several impacts including cost to rebuild the structures, potential flooding of agricultural land and property and impacts to surface water quality.
(ii) Construction Camps – Improper siting and design of construction camps can have negative impacts to hydrology, both surface and groundwater, through improper disposal of liquid waste and spills of hazardous liquids.

Construction Phase

357. Bridge Construction - Bridge construction activities may increase silt load in the river during construction at bridge sites and may result in accidental spillage of concrete and liquid waste into the river. This may impact upon the biodiversity of the rivers. The span of the bridges have been designed to avoid, as far as possible, the presence of foundation piles in riverbeds.

358. Hazardous Liquids - From the construction activities, there will be significant use of fuel and lubricant and other hazardous liquids such as paints. Without standardized materials handling and storage protocol in place, spills and contamination of groundwater and soils is possible. Other impacts to groundwater could occur from the washing out of concrete mixers onto bare soils and a lack of oil and grease interceptor tanks in camp drainage systems.

359. Water Use – Technical water may be sourced from the Aktobe reservoir and the Ilek river. The required amounts, potentially 200 m^3 per day are insignificant given the availability of water in the reservoir, however, abstraction form the Ilek during low flow periods may have significant impacts on the river. However, where necessary the relevant permits will be obtained for surface water abstraction. It is also noted that the water of the river is polluted with

Operational Phase

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

Management & Mitigation Actions

Pre-construction Phase

361. Water Use – The Contractor shall ensure he has in place all relevant permits for the use of technical water in accordance with the Decision of Aktobe Region Maslihat (N282, from 11.04.2018 – On changes for Water resources (surface sources) use charges. In addition, extraction of water for uses as technical water from the Ilek river will be prohibited during low flow periods, as determined by the Engineer and in line with the permit mentioned above.

362. Drainage and Flooding - Consideration in the design phase has be given to the issue of drainage and culverts to ensure that drainage patterns are improved from the existing conditions and that increased run-off does not occur or result in flooding of areas previously undisturbed. During design, all drainage works have been designed based on the historical flood data and flood forecasting. A design discharge of 50 years return period is considered for culverts, and 100 years of bridges.

363. Bridges - All bridges will be designed for the life expectancy of 100 years. The design loading and design of all structural components will conform to the bridge design standards provided in the Employer's Special Requirements.

364. The bridges shall include dry paths under the bridge on either side of the river to facilitate movements of people, livestock and wildlife.

365. Bridge designs will ensure that drainage from bridge decks over 50 meters do not discharge directly to the watercourses beneath the bridges. The bridge run-off waters will lead to an interceptor tank, or filter pond adjacent to the bridge in order to trap oil and grease run-off so that it cannot enter any portion of the Illek river. The bridge design and layout must also be aesthetically pleasing and in harmony with the existing environment. The Contractor, through his Environmental Manager, will be responsible for consulting with MoE to confirm the fish spawning period in relation to the bridge construction works to ensure that all works are scheduled to take place periods least likely to affect the fish spawning period.

366. The Contractor shall also prepare a ***Bridge Construction Plan*** prior to the starting of works at any bridge construction site. The Plan shall include items relating to the construction schedule, construction techniques, work areas, equipment use, siting of hazardous liquids and waste materials, provision of coffer dams, fish spawning periods, results of any other fauna surveys, e.g. for otters, procedures for fueling of vehicles, sediment management, methods to reduce turbidity, OHS measures, etc.

367. Construction Camps – In the first instance, no construction camp, permanent or temporary, will be located within 500 meters of any river, or reservoir, including the Ilek and any of its tributaries and the Aktobe reservoir. The Contractor will also be responsible for the preparation of a ***Construction Camp Site Plan*** which will form part of the SEMP. The Plan will indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, septic tanks, etc. The Contractor will ensure the following conditions are met within the Plan:

(i) Wastewater arising on the site will be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a way that will cause neither pollution nor nuisance.
(ii) There will be no direct discharge of sanitary or wash water to surface water, including the surface water courses identified in this report, including the Ilek and its tributaries or the Aktyubinskoe reservoir. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies will be prohibited.
(iii) Liquid material storage containment areas will not drain directly to surface water.
(iv) Lubricating and fuel oil spills will be cleaned up immediately and spill cleanup materials will be maintained (including spill kits) across the Contractors construction camp and ancillary facilities, e.g. asphalt plant.
(v) Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters.
(vi) Discharge of sediment-laden construction water directly into surface watercourses or wetlands will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.
(vii) Spill cleanup equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage:
(viii) Fueling operations will occur only within containment areas.
(ix) All fuel and chemical storage (if any) will be sited on an impervious base within a bund and secured by fencing. The storage area will be located away from any watercourse. The base

and bund walls will be impermeable and of sufficient capacity to contain 110% of the volume of the largest storage tank / container in the bund.

(x) Filling and refueling will be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.

(xi) All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.

(xii) The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any drain or watercourses.

(xiii) Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.

(xiv) Should any accidental spills occur immediate cleanup will be undertaken and all cleanup materials stored in a secure area for disposal. Disposal of such was will be undertaken by a waste management company contracted by the Contractor. The waste management company must have the required licenses to transport and dispose of hazardous waste before any such waste is removed from the site. The Contractor will keep copies of the company's licenses and provide waste transfer manifests at his camp site for routine inspection by the Engineer.

Construction Phase

368. Construction Camps and Storage Areas – The Engineer will undertake regular monitoring of the Contractors construction camp and storage areas to ensure compliance with the SEMP and the Contractors Construction Camp Site Plan.

369. Site plans will be devised to ensure that, insofar as possible, all temporary construction facilities are located at least 100 meters away from any surface water course including the Ilek and its tributaries or the Aktobe reservoir. If determined warranted by the Engineer, the Contractor will provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the Contractors camp sites. If so requested, the Contractor will ensure that all vehicles are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor will provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.

370. Bridge Construction – In the first instance the Contractor shall schedule all bridge works to coincide with low flow periods to avoid impacts to surface waters. Concerning bridge construction works, the Contractor will:

(i) Divert the water flow near the any bridge piers in the river.

(ii) Provide coffer dams, silt fences, sediment barriers or other devices to prevent migration of silt during construction within streams.

(iii) Perform dewatering and cleaning of cofferdams to prevent siltation by pumping from cofferdams to a settling basin or a containment unit.

(iv) Carry out bridge construction works without interrupting the traffic on the Project Road with the provision of suitable diversions.

(v) Ensure no waste materials are dumped in the river, including re-enforced concrete debris.

(vi) Place generators more than 20 meters from the river.

(vii) Ensure that no concrete waste is dumped in the river.

(viii) Carefully collect all polystyrene (from expansion joints) so that it does not litter the local environment.

(ix) Ensure that no hazardous liquids are placed within 10 meters of the river.

(x) Provide portable toilets at bridge construction sites to prevent defecation by workers into the river.

(xi) Ensure that workers are provided with correct PPE including harnesses.
(xii) During piling works ensure that pumped water is filtered through a silt trap before being discharged to the river.
(xiii) Provide areas where concrete mixers can wash out leftover concrete without polluting the environment. This may be in the form of a lined settling pond at each bridge site. Drivers will be informed of these locations and the requirements to use these settling ponds on a routine basis by the Engineer. Dried waste from the settling ponds can be used as backfill for culverts, etc.
(xiv) The Contractor shall consult with the TEPOs to establish the fish spawning period in relation to the bridge construction works. The Contractor shall ensure that all works are undertaken in periods least likely to affect the fish spawning period.

371. Drainage and Flooding - During the construction phase the Contractor will be required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage to properties and land by flooding and silt washed down from the works. Should any operation being performed by the Contractor interrupt existing irrigation systems, the Contractors will restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption. The Contractor will also be responsible for ensuring that no construction materials or construction waste block existing drainage channels within the Project corridor. The Engineer will be responsible for routine monitoring of drainage channels to ensure they remain free of waste and debris.

Operational Phase

372. During the operational phase of the Project, KazAvtojol will be responsible for monitoring drainage along the road to ensure that it does result in increased run-off and flooding. KazAvtojol will be responsible for rectifying this issue if it occurs.

373. During routine maintenance, KazAvtojol shall:
(i) Perform maintenance paving of the road sections and bridge decks only in dry weather to prevent runoff contamination.
(ii) Ensure culverts are regularly cleaned to maintain the flow of water in springtime floods.
(iii) Use staging techniques to reduce the spread of paving materials during the repair of potholes and worn pavement. These can include covering storm drain inlets and manholes during paving operations, using erosion and sediment controls to decrease runoff from repair sites, and using drip pans, absorbent materials and other pollution prevention materials to limit leaks of paving materials and fluids from paving machines.
(iv) Comply with mitigation measures defined for water protection during construction.
(v) Remove all waste, material, machinery and tool from the area after completion of works.
(vi) Reinstate disturbed areas – if the case.

Residual Impact Significance

Construction Phase – ***MINOR***

If the mitigation measures suggested are implemented, there will be no significant residual impacts to hydrology, including the Ilek river.

Operational Phase – ***LOW***

No residual impacts anticipated during the operational phase.

F.6.5 Natural Hazards

Potential Impacts

374. The project is not located in a seismically active area. Potential flood events are discussed above under **Section F.6.4 - Hydrology** and increased precipitation is discussed above under **Section F.6.2 Climate Change.**

Management & Mitigation Actions

375. None required.

Residual Impact Significance

Construction Phase – ***NONE***

No residual impacts are anticipated.

Operational Phase – ***NONE***

F.7 Ecological Resources

F.7.1 Biodiversity

Potential Impacts

376. Minor impacts upon habitats and flora in the project area are expected as a result of the road works. Rehabilitation work will cause minor degradation of local ecology through the clearance of areas of vegetation – mostly ground cover - at work sites and ancillary sites. However, few trees will need to be cut as part of the Project and no special status flora have been identified within the vicinity of the Project Road, including the bypass areas, that maybe adversely affected.

212. Consideration has been given to potential direct impact to biodiversity in the Project corridor due to:

(i) Habitat Loss - All of the Project works will be undertaken within the existing road corridor, with the exception of the bypasses around Alga and Kandyagash. These bypass areas have been modified by human activity over the years, mainly as pasture land for cattle. No special status flora or fauna have been identified in these areas. Borrow pits and quarries used will either be operational or require the approval of the Engineer and TEPOs, and as such impacts to habitat will have either been mitigated or will require mitigation as part of any approval process. Consultations with the Committee for Wildlife and Forestry in Aktobe and review of recent literature indicates that this area is not a habitat for Saiga Antelope.

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

within the existing RoWs (with the exception of two bypasses), and c) that this area is not an important habitat for Saiga antelope, minimizes any potential for habitat fragmentation.

(iii) Impacts to Aquatic Fauna. The duration of Projects work in the area of Ilek river is 30 days. Therefore the influence will be short-term. However, the increased turbidity caused by these works may lead to the loss of zooplankton and zoobenthos. At the site of the proposed work on the Ilek river there are no spawning grounds and other places of expressed concentration of fish and juveniles. There are no rare and Kzakh "Red Book" fish species or any fish species from the Ural river. However, the Carp (*Cyprinus carpio*) can be found in the Ilek river and is classified as Vulnerable by the IUCN red list. The Project OVOS has estimated that 360 juvenile carp (weight between 2-4 g) will be impacted negatively by Project works in the river.

(iv) Accidents Involving Cattle. The Project road will be fenced, this will limit the potential for accidents involving cattle. Underpasses for cattle have been provided as outlined in the **Section B - Project Description**.

(v) Notable Species – Consultations with the Committee for Wildlife and Forestry in Aktobe and review of recent literature on the subject indicated that Saiga Antelope are not present within the Project area. No other rare and endangered species) have been identified in the Project corridor except for the afore mentioned Carp (*Cyprinus carpio*).

Mitigation Actions

- Accidents Involving Cattle. As noted above, cattle underpasses have been recommended at certain locations within the Project corridor.
- Notable Species – The only identified notable species in the Project area is the Carp (*Cyprinus carpio*). The Project OVOS has indicated that around 360 juvenile carp will be affected by the Project works in the river, however, it also notes that washing of the river bed in the spring time due to floods will restore the natural characteristics of the aquatic environment and fish productivity of the water body after one year. The OVOS recommends the following mitigation measures for the Carp which shall be implemented as part of the Project:
    - Compensation of harm to fish stocks of the Ilek river is recommended to conduct by stocking of 1 year old carps.
    - It is not allowed to release juveniles on rodstones or rolling sections with a transit flow.
    - Before stocking it is recommended to carry out reclamation of predatory fish - perch, in the area of stocking. The catch of perch is carried out by staged networks with mesh not more than 30 mm.
    - When purchasing the carp yearlings it is recommended to pay attention to the following factors:
    - Fish are recommended to be purchased in cultural fish-breeding farms, located in the sixth fish-breeding zone.
    - Fish must have Certificate of quality and pass sanitary and quarantine supervision. You can not buy fry in farms that are located in the zone of natural foci of infectious and parasitic diseases of fish, except for those who use a closed system of water supply and practices a full sanitary-veterinary supervision;
    - Recommended dates for entering the summer-autumn. At the same time in the hot season transportation and release of juveniles must be carried out in a cool time of the day.
- The Contractor shall hire a national fish specialist to arrange the activities relating to the Carp. The specialist shall prepare a ***Carp Management Plan*** prior to the start of this activity and present it to the Engineer and KazAvtojol for review and approval before the activity commences. Obviously, this work can only commence once the bridge works are completed but should be completed within one year. The plan shall comply with the current legislation of the Republic of Kazakhstan and control of the authorized body for the protection of fish resources.

- During the construction phase there shall be no fishing in the Ilek river by contractors staff or sub-contractors.
- During site clearance works no pesticides or herbicides shall be used.

Residual Impact Significance

Construction Phase – ***NONE***

No residual impacts are anticipated as long as the recommendations for Carp mitigation are implemented correctly.

Operational Phase – ***NONE***

F.7.2 Forests and Protected areas

Potential Impacts

214. No protected areas or forests are within the vicinity of the Project area.

Mitigation Actions

215. None required.

Mitigation Measures

Residual Impact Significance

Construction Phase – ***NONE***

No residual impacts are anticipated.

Operational Phase – ***NONE***

F.8 Economic Development

F.8.1 Transportation Facilities & Utilities

Potential Impacts

Transportation Facilities

Construction Phase

377. Two of the main impacts resulting from Project works will be short term road diversions and some temporary blocking of access to properties during the construction phase.

378. In some locations closure of access roads will be needed and may occur for periods between one and two hours and as such is not a significant issue as long as the local population are given notice of the delays and suitable detours are provided. Longer-term road closures maybe required while the new road is constructed within Bestamak. This issue is discussed above under section **B.6.5 Diversions**. In this area of the diversion a school is present adjacent to the road. It has been recommended that this diversion is not used due to its proximity to the school.

379. Blocking of access to properties will be temporary while structures, such as side drains and culverts, are constructed, however alternative access to properties will be provided at all times by the Contractor.

Operational Phase

380. No negative impacts are anticipated to transportation facilities during the operational phase of the Project. However, the potential beneficial impacts to transport are significant. The road, when complete, will offer reduced travel times to major urban areas, smoother ride (resulting in less vehicle maintenance and less damage to perishable goods) and safer driving conditions. In addition, the traffic volumes on the existing road will reduce significantly resulting in less accidents on the existing road.

Utilities

381. Electricity transmission and distribution lines, gas pipes and telecoms lines are located within the Project corridor. As part of the detailed design KazAvtojol have collected all relevant information regarding the utilities in the Project corridor. This information will be provided to the Contractor for coordination of with the relevant utility operator.

Management & Mitigation Actions

Transportation

Pre-construction Phase

382. To mitigate the potential impacts the Contractor will:
(i) Submit a ***Traffic Management Plan*** (TMP) to local traffic authorities prior to mobilization and include the plan as part of his SEMP. The TMP shall include plans of haul routes and access roads used for construction traffic which will be strictly adhered to with oversight from the Engineer;
(ii) The TMP should include an alternative diversion in Bestamak to avoid the afore mentioned school; and
(iii) As part of his TMP, the Contractor shall provide haul routes to any borrow pits which, as far as is practical, avoid populated areas.

383. The volume of construction traffic is considered to be intensive truck traffic and will need to be managed both in terms of surface damage. A ***Road Condition Survey*** of all roads included in the Contractors TMP will be conducted by the Engineer prior to construction in order to gauge any damage to the road as a result of the intensive heavy traffic during the construction phase. Before completion of the Project the Engineer shall repeat the survey to determine which, if any roads need to be repaired by the Contractor.

Construction Phase

384. The Contractor shall:
(i) Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions at least 24 hours before the disruptions;
(ii) Allow for adequate traffic flow around construction areas via diversions or temporary access roads (excluding the diversion by Bestamak school);
(iii) If temporary access roads are to be constructed with a gravel surface they shall be routinely watered by the Contractor during dry weather to reduce dust impacts; and
(iv) Provide adequate traffic signs, appropriate lighting, well-designed traffic safety signs, barriers and flag persons for traffic control.
(v) Access roads for batching plants, etc, should be maintained during the construction phase and rehabilitated at the end of construction.

Utilities

Construction Phase

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

Residual Impact Significance

Construction Phase – ***MINOR***

No residual impacts are anticipated if the TMP and the other mitigation measures outlined above are implemented correctly.

Operational Phase – ***LOW***

If the mitigation measures suggested are implemented, the residual impacts of the Project will be low.

F.8.2 Land use

Potential Impacts

386. Livestock and Agriculture – A number of land plots will be affected by the Project. In addition to this the Project road could also result in other impacts to agricultural land during the construction phase, these include:
(i) Dust – This issue and its impacts on crops are discussed above under **Item G.5.1 Air Quality**. Mitigation suggested involves correct siting of dust producing areas, such as batching plants, away from agricultural land and dampening of stockpiles and access roads during construction. Implementation of the mitigations measures in this IEE relating to facilities such as batching plants, will further reduce the possibility of significant impacts arising.

(ii) Temporary Land Take – Apart from the areas identified in the draft LARP, land for access roads, construction camps and temporary storage areas will also be required.
(iii) Accidents involving livestock – Fencing of the road will eliminate this issue.

Management & Mitigation Actions

387. The key mitigation for land use is implementation of the LARP. Regarding temporary land take for areas such as construction camps, the Contractor will pay the rates specified in the LARP to landowners for the use of these areas. In addition, where practical all additional construction related areas such as construction camps, etc., should, as far as possible, avoid being site on agricultural land.

Residual Impact Significance

Construction Phase – ***MINOR/MODERATE***

No residual impacts are anticipated if the LARP is implemented correctly. However, there will still be disruption to the local community during the LARP implementation process. A GRM has been prepared to manage complaints received during this process.

Operational Phase – ***NONE***

No residual impacts are anticipated if the LARP is implemented correctly.

F.8.3 Waste Management

Potential Impacts

388. General Construction Waste - Road construction will inevitably generate solid and liquid waste products including:
(i) Inert waste – for example, concrete, metal, wood and plastics.
(ii) Hazardous waste – acids and alkaline solutions, waste oils and oily sludge, batteries, and bitumen.

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

390. The main construction waste produced will waste concrete (solid and sludge) and possible asphalt, depending upon how much can be re-used as sub-base material. Table 35 indicates the main types of waste and an estimate of volumes (based on similar road construction projects).

Table 35: Waste Types and Estimated Volumes

#	Waste Type	Hazardous	Estimated Volume
1	Concrete	No	200 m^3
2	Asphalt	No	56,000 m^3 *
3	Bituminous Mixtures	Yes	1 t
4	Wood	No	10 t
5	Uncontaminated Metal	No	10 t

#	Waste Type	Hazardous	Estimated Volume
6	Uncontaminated Plastic	No	5 t
7	Contaminated metal (paint tins, etc.)	Yes	5 t
8	Contaminated plastic (oil containers)	Yes	3 t
9	Domestic waste (food stuffs)	No	10 t
10	Domestic Waste (non-foodstuff)	No	40 t
11	Sewage Water	Yes	150 m^3
12	Tyres	Yes	150 t
13	Hazardous liquid waste (e.g. waste oil)	Yes	2 m^3

* Based on 70km of existing road, 8m wide and asphalt depth of 10cm.

Management & Mitigation Actions

391. To ensure waste management is adequately controlled during both the construction phase of the Project, the Contractor shall be responsible for ensuring that the waste hierarchy is followed including prevention, minimization, reuse and recycling. Specifically the Contractor will be responsible for the following measures:

(i) ***Waste Management Plan (WMP)*** – The WMP shall include items relating to the safe handling and management of:
   (a) Domestic waste
   (b) Food waste
   (c) Recycled Waste
   (d) Plastic
   (e) Metals
   (f) Wood
   (g) Construction Waste
   (h) Hazardous Waste
   (i) Liquid Waste

(ii) Recycling and Reuse – Where possible, surplus materials will be reused or recycled – this should include asphalt, concrete, wood, plastic, metal and glass. A plan for the recycling of materials should be included in the WMP. Approximately 50,000 m^3 of asphalt will be excavated from the existing pavement. Where practical this material should be re-used in the construction process.

(iii) Storage of Hazardous Wastes – Oils, fuels and chemicals are substances which are hazardous to human health. They need to be stored properly in correctly labeled containers, both within the construction camp and also at construction areas. Oil and fuel should be stored in tanks with lined bunds to contain spillage (the bund should be able to contain at least 110% of the volume of the largest storage tank within the bund).

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

(v) Liquid Waste – The issue of liquid waste, including concrete sludge, camp run-off water, vehicle washing water, batching plant wastewater, etc., is discussed above under section **F.5.5 – Hydrology** and **F.7.4 Construction Camps, Asphalt Plants, Batching Plants and Temporary Storage Sites**.

Residual Impact Residual Impact Significance

Construction Phase – ***MINOR/MODERATE***

In general, if the mitigation measures suggested are implemented residual impacts will be minor.

Operational Phase – ***NONE***

F.8.4 Construction Camps, Asphalt Plants, Batching Plants & Temporary Storage Sites

Potential Impacts

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

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

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

395. Asphalt Plants – Several impacts are associated with asphalt plants:
(i) Emissions – including dust from the transport and handling of aggregates and emissions from the combustion process in the dryer.
(ii) Noise - Noise occurs at different places in the process for examples in the conveyor belts, dryer and mixer drum, internal and external traffic. The noise is estimated to be in the range of 90 to 100 dBA (Leq) at a few metres from the equipment.
(iii) Storage of Bitumen – Drums of bitumen will be stored safely and securely to prevent accidents and pollution.
(iv) Storage and Use of Hazardous Materials – Some materials used during asphalt production, such as Kraton, can be explosive or a fire hazard. These materials need to be stored and managed appropriately.
(v) Health and Safety - Asphalt Plants can be very dangerous, accidents may occur at any time. Hence it is important to have a proper policy for the Health and Safety Issues.
(vi) Vehicle Movement – a large number of trucks will be required to transport the hot asphalt from the plant to the work site, this may be a distance of up to 25 kilometers (assuming two construction ‘lots’ and a construction camp close to the middle portion of each lot).

396. Temporary Storage Sites – These areas will be used to store materials and equipment on a temporary basis as an alternative to storing materials at the camp. Materials may also need to be stored close to work sites to allow quick and easy access to these materials, e.g. stockpiles of aggregates, pre-cast culverts, etc. None of the materials stored in these areas will be hazardous materials.

Management & Mitigation Actions

397. Construction Camps – The location of construction camps and facilities is not known at this stage of the Project and will be a decision for the Contractor to make based on a range of issues, such as availability of land, cost, access, etc., as well as environmental and social issues. However, a range of good practices measures can be applied to these sites to ensure that they have minimal impacts on the environment and the local communities.

398. Prior to commencement of works, the contractor must identify the location of the camp and undertake environmental and social screening of the site to ensure that no significant environmental or social issues will arise as a result of the use of the site. The results of the screening will be provided to the Engineer and KazAvtojol for their review and approval. If the Engineer and KazAvtojol are satisfied with the results of the screening exercise the Contractor shall then agree on/receive a permit for its use from the state or the land owner. No construction camp will be located within one kilometer of an urban area and at least 50 m from any surface water course.

399. The Contractor will be responsible for the preparation of a ***Construction Camp Site and Management Plan*** which will form part of the SEMP. The Plan will indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. The Contractor will ensure the following conditions are met within the Plan:

(i) Rain-water run-off arising on the site will be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance. The drainage system will be fitted with oil and grease interceptors.
(ii) There will be no direct discharge of sanitary or wash water to surface water.
(iii) In the absence of functioning sewerage and sewage treatment facilities it is recommended that the Contractor provides his own on-site septic tanks. There will be no direct discharge of untreated sanitary or oily wastewater to surface water bodies.
(iv) Licensed contractors will be required to collect and disposal of liquid waste from the septic tanks on regular basis.
(v) Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies will be prohibited.
(vi) Liquid material storage containment areas will not drain directly to surface water.
(vii) Waste water from vehicle washing bays will be free of pollutants if the wash bay has been constructed correctly.
(viii) Lubricating and fuel oil spills will be cleaned up immediately and spill cleanup materials will be maintained at the storage area.
(ix) Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters and are connected to septic tanks, or waste water treatment facilities.
(x) Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.

(xi) Washing out concrete trucks at construction sites will be prohibited unless specific concrete washout areas are provided for this purpose at the construction site (e.g. a bridge site). The washouts will be impermeable and emptied when 75% full.
(xii) Spill cleanup equipment will be maintained on site (including at the site maintenance yard and vehicle fueling areas). The following conditions to avoid adverse impacts due to improper fuel and chemical storage:
  (a) Fueling operations will occur only within containment areas.
  (b) All fuel and chemical storage (if any) will be sited on an impervious base within a bund and secured by fencing. The covered storage area will be located away from any watercourse or wetlands. The base and bund walls will be impermeable and of sufficient capacity to contain 110% of the volume of tanks.
  (c) Filling and refueling will be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.
  (d) All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.
  (e) The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any drain or watercourses.
  (f) Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.
  (g) Should any accidental spills occur immediate cleanup will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized to dispose of hazardous waste.

400. If determined warranted by the Engineer, the Contractor will provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor will ensure that all vehicles are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor will provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site. The Engineer will undertake regular monitoring of the construction camps to ensure compliance with the SEMP and the Construction Camp Site Plan.

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

402. The Contractor will also ensure that potable water for construction camps and workers meets the necessary water quality standards of the GoK. If groundwater is to be used it will be tested weekly to ensure that the water quality meets the GoK drinking water standards.

403. Concrete Batching Plants – The following measures will be followed to limit the potential for pollution from batching plants:
(i) To limit impacts from dust, the following conditions will apply:
  (a) Batching plants will be located downwind of urban areas and not within one kilometer of any urban area.
  (b) The entire batching area traversed by vehicles – including driveways leading into and out of the area – will be paved with a hard, impervious material.
  (c) Sand and aggregates will be delivered in a dampened state, using covered trucks. If the materials have dried out during transit they will be re-wetted before being dumped into the storage bunker.

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

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

404. Asphalt Plants – the following measures will be applied by the Contractor:

(i) Emissions & Noise:
  (a) Asphalt plants will be located downwind of urban areas and not within one kilometer of any urban area.
  (b) Adequate Personal Protective Equipment (PPE) will be provided to staff working in areas of high noise and emissions.
(ii) Storage and Use of Hazardous Materials (including bitumen):
  (a) Ensure all hazardous materials are stored (including within suitable sized bunds for liquids), handled and disposed of according to their Material Safety Data Sheet (MSDS).
  (b) Copies of MSDS will be kept on site with all hazardous materials.
  (c) The Contractor will keep a log of the type and volume of all hazardous wastes on site.
  (d) The Contractor will keep a plan of site indicating where all hazardous materials are stored.
(iii) Vehicle Movement:
  (a) The Contractor will include the asphalt plant in his Traffic Management Plan, including haul routes from the plant.
(iv) Health and Safety:
  (a) To prevent bitumen burns it will be compulsory for the workers handling hot bitumen to wear full-body protection.
  (b) All transportation, handling and storage of bitumen will be handled safely by experienced personnel.
  (c) The dust from the manufacturing process may pose respiratory hazards, hence protective air mask will be provided to the operators for the loading and unloading of aggregates.
  (d) Ear-muffs will be provided those working on the plant.
  (e) First Aid kit will be available on site for the workers in case of emergency.
  (f) The MSDS for each chemical product will be made accessible onsite and displayed.

405. Temporary Storage Areas – The Contractor will be responsible for preparing a ***Method Statement for the Opening, Operation and Reinstatement of Temporary Storage Area*** for any areas over one hectare in size. The method statement shall be prepared and submitted to the Engineer for approval before any such site can be used. Many of these sites will be located close to rivers, and as such the Contractor will ensure that the method statements include specific measures to ensure no pollution of the rivers, including banning of the storage of hazardous liquids in these areas. The method statement shall also clearing illustrate the conditions of the site prior to its clearing and use, so that it can be fully re-instated to its former conditions. The method statement shall also indicate what type of vegetation has been cleared at the site, and where this has occurred, the Contractor shall be responsible for replanting of any trees cut in these areas on a 1:3 basis.

Residual Impact Significance

Construction Phase – ***MINOR***

If the mitigation measures suggested are implemented residual impacts will be minor

Operational Phase – ***LOW***

If the mitigation measures suggested are implemented residual impacts will be low as long as reinstatement plans are followed correctly.

F.9 Social and Cultural Aspects

F.9.1 Employment Creation, Skills Enhancement and Local Business Opportunities

Potential Impacts

406. The Project is expected to generate positive impacts on the local economy and livelihoods in terms of employment and skills enhancement and local business opportunities through the procurement of goods and services.

407. Positive impacts will be primarily associated with the construction phase and therefore temporary in nature. The termination of construction contracts will occur once construction activities are completed. Workers who have relocated to the area for the Project are likely to leave the area in search of other opportunities, especially if they are permanent employees of Contractors and subcontractors.

408. Those who have worked on the Project will have an advantage when seeking alternative jobs on similar projects due to the experience and any training received through this Project.

409. The construction phase will last approximately 31 months for Km11-52 and 33 months for km52-100 (both sections will be constructed in parallel) and it is expected that approximately 200-300 direct employment opportunities will be available during the peak of construction. The breakdown of skills required during the construction phase will be as follows:
(i) Skilled labour: 58%;
(ii) Semi-skilled labour: 20%; and
(iii) Unskilled labour: 22%.

410. Local procurement will benefit the hospitality and service industries primarily, such as catering, cleaning, transport and security services. Local businesses will benefit during the construction phase as there will be increased spending within the area by the wage labor who will have improved buying power while employed by the Project.

411. During the operational phase of the Project diversion of traffic from the existing road to the new bypasses may affect some roadside business in the Project areas including small roadside shops and restaurants. The level of trade with road users will fall, but they will still be able to provide their services to the local community.

Residual Impact Significance

Construction Phase – ***NONE***

If the mitigation measures suggested are implemented residual impacts will be minor.

Operational Phase – ***LOW/MEDIUM***

After the Project construction phase many local workers may be without employment. However, the Project will have provided them, in many instances, with additional skills and experience to work on similar projects in other locations. Local businesses supplying the Contractors and their staff may also see a fall in trade, this is an unavoidable consequence of the Project.

F.9.2 Community Health and Safety

Potential Impacts

412. The presence of the Project could affect the health, safety and security of the communities in the area of influence as a result of worker-community interactions, in-migration to the area, increased incomes in the local community that may be used for drugs, alcohol and prostitution, the risk of injury associated with construction and operational activities, increased pressure on health care resources and changes to the environment.

Construction Phase Impacts

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

(i) Workforce, Jobseekers and Social Conflict. In some instances the local population may not be able to provide the necessary skilled workers for the Project. In such cases workers from other regions, or other countries may be employed by the Contractor. This could lead to social tensions and potential conflict if these workers are not aware of local customs and practices. An increase in disposable income within the Project area (among Project workers, both local and external) may also result in a change in spending habits and behavior resulting in increase in alcohol and drug abuse, increased incidences of prostitution and casual sexual relations, which poses a threat to community health and safety.

(ii) Pressure on Social Infrastructure and Services. During the construction phase workers will be accommodated on-site and as such there will be no pressure on local housing stock. In addition, the Contractor will also have his own on-site medical facilities. Any serious injuries will be treated in Aktobe, Alga or Kandyagash.

(iii) Road Safety. Construction of the Project Road will require a large amount of vehicle movements, locally. These could potentially result in road traffic accidents between vehicles, pedestrians and vehicles and livestock and vehicles if suitable plans and mitigation is not in place. This is especially relevant in Bestamak.

(iv) Air quality and noise. Potential air and noise issues and their impacts to the local population are discussed above under items **F.6.1 – Air Quality**, **Item F.8.4 – Construction Camps and Batching Plants** and **Item F.9.7 – Noise.**

Operational Phase Impacts

414. Road Safety. The road has been designed with bypasses around two major urban areas. This will serve to limit the potential for accidents involving pedestrians. In Bestamak the road has been designed with several pedestrian road crossings. In addition, the condition of the new road will be a significant improvement on the existing pavement and as such will lead to a reduction in the number of accidents on the road per capita.

415. Community Severance. The only area where community severance will be an issue is Bestamak. Noise barriers are planned through the village and these barriers will block immediate access across the road except at the locations of pedestrian crossings. This may mean that in some instances residents will have to make a 500 meter journey on foot to reach a property that is currently opposite their home. Obviously this is an inconvenience, but it will result in improved safety conditions and also a healthier home environment in terms of reduces noise levels.

416. Air Quality & Noise – These issues are discussed in detail under items **F.6.1 – Air Quality** and **Item F.9.7 – Noise.**

Management & Mitigation Actions

Pre-construction Phase

417. Prior to start of site works in residential areas residents, business representatives in the local area, local authorities and other stakeholders (including NGOs, who are likely to be affected by the project or are interested in the project) shall be informed on the construction schedule and activities, potential environmental impacts and mitigation measures through public meetings.

Construction Phase Mitigation

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

419. Road Safety – The Contractor will be responsible for preparing a ***Traffic Management Plan*** for the construction phase of the Project.

420. Community Severance - The Contractor will ensure that all access across the road in Bestamak is available at reasonable distances along the construction zone (at least every 500 meters) during the Construction phase. These crossing zones shall be manned to avoid accidents with construction vehicles and equipment.

421. Social Conflicts. The Contractor shall provide regular health and safety training to their workers which will include sessions on social and cultural awareness. The Contractor will also sub-contract an organization to develop and implement an HIV/AIDS policy and information document for all workers directly related to the Project. The information document will address factual health issues as well as behavior change issues around the transmission and infection of HIV/AIDS. In addition, the Contractor shall develop an induction program, including a Code of Conduct, for all workers directly related to the Project. A copy of the Code of Conduct is to be presented to all workers and signed by each person. The Code of Conduct must address the following aspects:

(i) Respect for local residents and customs;
(ii) Zero tolerance of bribery or corruption;
(iii) Zero tolerance of illegal activities by construction personnel including:
    (a) prostitution;
    (b) illegal sale or purchase of alcohol;
    (c) sale, purchase or consumption of drugs; and
    (d) illegal gambling or fighting.
(iv) No alcohol and drugs policy during working time or at times that will affect ability to work; and
(v) Description of disciplinary measures for infringement of the Code and company rules. If workers are found to be in contravention of the Code of Conduct, which they signed at the commencement of their contract, they will face disciplinary procedures that could result in dismissal.
(vi) In addition, Project security guards shall not to violate the safety of local residents or other individuals involved in the project.

422. In addition, the Contractor will be responsible for holding monthly community meetings within the Project area throughout the construction period. The monthly meetings will be held in the villages along the alignment and will provide a forum for locals to discuss specific issues, such as noise and dust with the Contractor before making complaints formal through the Grievance Redress Mechanism. The minutes of meetings shall be recorded and a list of participants prepared (including

signatures). Photos of each event shall be taken (with timestamps). The Contractor shall prepare a short monthly summary of the meetings including all of the above information and submit it for review to the Engineer and KazAvtojol within a week of the meeting.

Residual Impact Significance

Construction Phase – ***MINOR***

If the mitigation measures suggested are implemented residual impacts will be minor.

Operational Phase – ***LOW***

There will be some inconvenience related to crossing the road in Bestamak, but this will be offset by better safety and lower noise levels.

F.9.3 Workers' Rights & Occupational Health and Safety

Potential Impacts

423. Occupational Health and Safety - Accidents are common during a project of this size and scale. Accidents can occur if workers are not adequately trained or qualified for the job or if they have incorrect safety equipment and clothing. In addition, contaminated soils around Alga could impact upon the health of workers rehabilitating the existing road if adequate PPE is not worn.

424. Sexually Transmitted Diseases – See **Section F.9.2 – Community Health and Safety**, above for impacts and mitigation relating to STDs.

425. Worker Rights - Workers' rights including occupational health and safety need to be considered to avoid accidents and injuries, loss of man-hours, labor abuses and to ensure fair treatment, remuneration and working and living conditions. These issues need to be considered not only for workers who are directly employed by the Project but also sub-contractors.

426. The Project is expected to create around 200-300 direct employment opportunities during the peak of the construction period, which will be approximately 31 months for Km11-52 and 33 months for km52-100. The majority of workers will be engaged by the Contractor and will consist of a semi-skilled to skilled workforce.

427. The expected impacts on worker rights and H&S as a result of construction, activities and Project operation are as follows:

(i) Risk to workers H&S due to hazardous construction activities and other general construction activities, e.g. traffic accidents; and
(ii) Violation of workers' rights.

428. Construction activities will involve the operation of heavy equipment and trucks, working at height, construction traffic, use of electric devices, handling of hazardous materials and other hazardous activities. Due to the nature of the activities being undertaken during construction, worker H&S is a key risk with the potential for accidents that may result in injuries and fatalities as well as lost man-hours. It is also important to ensure that workers have access to safe water supplies.

Management & Mitigation Actions

429. An ***Occupational Health and Safety Plan*** will be prepared by the Contractor to manage worker safety. The Plan will include the following items:

(i) Safety Training Program. A Safety Training Program is required and will be delivered by a qualified H&S expert. The program will consist of:
   (a) Initial Safety Induction Course: All workmen will be required to attend a safety induction course before they are allowed access to the Site.
   (b) Periodic Safety Training Courses: Period safety course will be conducted not less than once every six months. All Contractor (and any sub-contractor) employees will be required to participate in relevant training courses appropriate to the nature, scale and duration of the works. Training courses for all workmen on the Site and at all levels of supervision and management. A list of training participants names and time-stamped photographic evidence of the training will be provided by the Contractor to the Engineer for his records.
   (c) Safety Meetings. Regular safety meetings will be conducted on a monthly basis. The Engineer will be notified of all safety meetings in advance. The Engineer may attend in person or by representative at his discretion. The minutes of all safety meetings will be taken and sent to the Engineer within seven (7) days of the meeting and will include a list of participants names and time-stamped photographic evidence of the training.
   (d) Safety Inspections. The Contractor will regularly inspect, test and maintain all safety equipment (including firefighting equipment), scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. Lights and signs will be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, will be repaired or replaced immediately by the Contractor.
   (e) PPE – Workers will be provided (before they commence works) with of appropriate PPE suitable for electrical work such as safety boots, helmets, gloves, protective clothes, goggles, and ear protection at no cost to the workers. Life vests will be provided for all staff working around, or above rivers. Masks to limit dust inhalation shall be provided to all Contractors staff working in the area around the Alga Chemical Plant.

(ii) The Contractor shall keep a log of both training records and safety incidents including near misses.

(iii) All construction plant and equipment used on or around the Site will be fitted with appropriate safety devices. These will include but not be limited to:
   (a) Effective safety catches for crane hooks and other lifting devices, and
   (b) Functioning automatic warning devices and, where applicable, an up-to-date test certificate, for cranes and hoists.

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

(v) Portable toilet facilities for workers at road work sites will be provided.

(vi) Fencing on all areas of excavation greater than 2 m deep will be installed along with warning signs.

(vii) Ensure sufficient fresh air supply to confined work spaces.

(viii) Keep air inlet filters clean and free of dust and microorganisms.

(ix) Ensure reversing signals are installed on all construction vehicles.

(x) Implement fall prevention and protection measures whenever a worker is exposed to the hazard of falling more than two meters, falling into operating machinery or through an opening in a work surface. Note: fall prevention/protection measures may include installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area, proper use of ladders and scaffolds by trained employees, use of fall prevention devices, including safety belt and lanyard travel limiting

devices to prevent access to fall hazard, fall protection devices such as full body harnesses, etc.
(xi) Mark the areas where risk of injuries from falling objects exist with rope or flagging to minimize risks and injuries.
(xii) Provide spotters. Employ flag persons to control traffic when construction equipment is entering or leaving the work area.

430. Contaminated dust – Specific PPE measures shall be provided for workers rehabilitating the existing road around Alga, they include:

- Half mask respirators.
- Safety goggles (completely enclosed to prevent dust within the goggles).
- One time disposable overalls.

431. Sub-contractors - All Project sub-contractors will be supplied with copies of the SEMP. Provisions will be incorporated into all sub-contracts to ensure the compliance with the SEMP at all tiers of the sub-contracting. All subcontractors will be required to appoint a safety representative who will be available on the Site throughout the operational period of the respective sub-contract unless the Engineers approval to the contrary is given in writing. In the event of the Engineers approval being given, the Engineer, without prejudice to their other duties and responsibilities, will ensure, as far as is practically possible, that employees of sub-contractors of all tiers are conversant with appropriate parts of the SEMP. To implement the above items the Contractor will designate a qualified environmental, health and safety personnel.

432. Water supply – If groundwater is to be used as potable water it will be tested weekly to ensure that the water quality meets the GoK drinking water standards.

Residual Impact Significance

Construction Phase – ***MINOR***

If the mitigation measures suggested are implemented residual impacts will be minor.

Operational Phase – ***NONE***

F.9.4 Emergency Response Planning

Potential Impacts

433. Emergency situations may arise during the construction phase of the Project, for example, fires and explosions (through poor management and storage of fuels and chemicals).

Management & Mitigation Actions

Construction Phase

434. The Contractor will be responsible for preparation of an Emergency Response Plan (ERP) which will include sections relating to:
(i) Containment of hazardous materials;
(ii) Oil and fuel spills;
(iii) Fire, gas leaks and explosions;

(iv) Work-site accidents;
(v) Community /civil unrest and strike action; and
(vi) Earthquake and other natural hazards.

435. The plan will detail the process for handling, and subsequently reporting, emergencies, and specify the organizational structure (including responsibilities of nominated personnel). The plan will be submitted to the Engineer for approval. Implementation of the plan will be monitored by the Engineer. Any emergencies, and how they were handled, will be reported in monthly progress reports by the Contractor to the Engineer. The Engineer will also provide periodic monitoring of the Contractors works throughout construction to ensure the ERP is implemented effectively.

Residual Impact Significance

Construction Phase – ***MINOR***

If the mitigation measures suggested are implemented residual impacts will be minor.

Operational Phase – ***NONE***

F.9.5 Physical and Cultural Resources

Potential Impacts

436. As noted by **Section E.4.4** several cemeteries, monuments and mosques can be found within the Project corridor.

437. It is possible, given the rich cultural heritage of Kazakhstan, that chance finds could occur during excavation works.

Management & Mitigation Actions

438. During the construction phase works shall be schedule that no works occur within 250 meters of the Mosque on Fridays, or during religious holidays. Fencing around the cemeteries at KM 62 and KM 71 shall also be provided throughout the construction phase to ensure there is no encroachment into this area.

439. In the event of any chance finds during the construction works procedures shall apply that are governed by GoK legislation and guidelines. A chance finds procedure shall also be developed by the Contractor. **Appendix H** provides a sample chance find procedure which the Contractor could adopt.

Residual Impact Significance

Construction Phase – ***MINOR***

If the mitigation measures suggested are implemented residual impacts will be minor.

Operational Phase – ***NONE***

No impacts in terms of noise or air quality are anticipated given the mitigation measures outlines as part of this IEE.

F.9.6 Vibration

Potential Construction Vibration Impacts

440. Ground-borne vibration is the oscillatory motion of the ground about some equilibrium position, and can be described in terms either of displacement, velocity or acceleration. Because human sensitivity to vibration typically corresponds best to the amplitude of vibration velocity within the low frequency range of most concern (roughly 5- 100 Hertz), vibration velocity is the preferred measure for evaluating ground-borne vibration from transit projects.

441. Vibration from the construction activities is a cause concern to the community. The effects of vibration varies and depends on the magnitude of the vibration source, the particular ground conditions between the source and receiver, presence of rocks or other large structures in the area. The intensity, duration, frequency and number of occurrences of a vibration all play an important role in both the annoyance levels caused and the strains induced in structures.

442. The effects of vibration includes annoyance, sleep disturbance, and potential damage to structures.

443. The proposed criteria for damage to buildings are shown in Table 36. These are derived from British Standard BS 6472 and German Standards DIN 4150-3:1999.

Table 36: Criteria for Structural Damage Due to Vibration.

No damage likely	PPV <5mm/s
Cosmetic damage risk	PPV 5 to 15 mm/s
Structural damage risk	PPV > 15 mm/s

444. **General Construction** - Table 37 provides an indication of the approximate vibration levels that may be expected for various vibration sources. The cells highlighted in red show where cosmetic damage may occur. No structural damage is anticipated at distances greater than 5m.

Table 37: Approximate Vibration Levels at Various Sources

Equipment Type	Distance (m)	PPV (in/sec)	PPV (mm/s)
Vibratory Roller	3	0.5775	14.47
	5	0.3609	9.17
	10	0.1805	4.58
	25	0.0704	1.79
Large Bulldozer	5	0.1530	3.89
	10	0.0765	1.94
	25	0.0298	0.76
Loaded Trucks	5	0.1306	3.32
	10	0.0653	1.66
	25	0.0255	0.65

	5	0.0602	1.53
	10	0.0073	0.19
Jack-hammer	25	0.0117	0.30

Note: Values based upon Table 18. Vibration Source Amplitudes for Construction Equipment and Equation 12 of the Transportation and Construction Vibration Manual, Caltrans, 2013.

445. Due to the fact that most of the Project road is uninhabited the potential for impacts from construction vibration on people and properties is limited to the area of Bestamak and KM 0.0 – KM 0.5.

446. The residential properties in the area of KM 0.0 – KM 0.5 are located more than 50 meters from the road centerline, or around 40 meters from the edge of the Project road. Using the data provided in Table 34 it can clearly be seen that none of the construction activities listed would result in vibrations levels above 5mm/s.

447. In Bestamak the situation is different. The Project road in this location includes the main four lane pavement and slip roads either side of the main pavement, meaning that at some parts of Bestamak construction will occur more or less up to the fenced boundaries of some properties. Most properties are located around 5 meters of so behind the fenced boundaries, but several are within one or two meters of the boundary wall meaning that they could be within 5 meters of the construction zone, but not closer than 3 meters.

448. Most of the properties in this strip along Bestamak appear to have been constructed within the last 30-40 years and are single story wood and brick type constructions

Figure 24: Typical Property, Bestamak

449. Using Table 34 it can be seen that vibratory rollers could have an impact upon properties in this area, potentially even causing cosmetic damage to the properties located within 5m of any such works (potentially around 46 properties over a 900 meter section. These properties are mapped in **Appendix K**). However, it is noted that the requirements to compact the slip roads will be different

compared with the main Category 1-b road and these roads will be built considering light urban traffic, not the intensive heavy goods vehicles that will use the main pavement. Accordingly the type of compaction for these slip roads will most likely produce lower vibration levels that than of the main pavement.

450. No other construction activities listed in Table 37 are anticipated to result in PPV above 5 mm/s.

Potential Operational Vibration Impacts

451. Highway traffic is not likely to have any measurable vibration impact on the structures or on comfort because vehicles traveling on highways are supported on flexible suspension systems and pneumatic tires, these vehicles are not an efficient source of ground vibration.

452. The Federal Highway Administration of the USA has determined that "All studies the highway agencies have done to assess the impact of operational traffic induced vibrations have shown that both measured and predicted vibration levels are less than any known criteria for structural damage to buildings. In fact, normal living activities (e.g., closing doors, walking across floors, operating appliances) within a building have been shown to create greater levels of vibration than highway traffic." [18]

Construction Phase Vibration Management & Mitigation

453. To manage the potential vibration issues in Bestamak the following procedures have been developed which must be followed by the Contractor.

454. Condition Surveys - Not later than 28 days before the commencement of construction works, the Contractor and the Engineer will carry out joint condition surveys of all buildings listed outlined in **Appendix K** and any other buildings along the road alignment that, in the opinion of the Engineer might be affected by vibration resulting from the Contractor's construction operations. The surveys shall be conducted in the presence of and with the permission of the property owners. The findings of the building condition surveys shall be recorded in the reports that shall contain the following information, as a minimum:

- Building address and location;
- A description of the building condition and any cosmetic and/or structural damage;
- Sketches and photographs showing the location and extent of any damage;
- High resolution video recordings of the surveyed buildings; and
- Verification of the report by the building owner.

455. Construction Vibration Management Plan - Within 28 days of the Commencement Date, the Contractor shall submit to the Engineer for review and approval a written ***Construction Vibration Management Plan*** (CVMP) detailing the procedures for vibration monitoring and control. Such details shall include:

[18] http://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/analysis_and_abatement_guidance/polguide09.cfm

- Measurement locations and methods;
- Method statements for works likely to induce vibrations, including programs of trial construction sections to determine the likely magnitude of vibrations at defined distances from the vibration source, in sufficient detail for the contractor to develop a final method for constructing the works without excessive vibration;
- Description of the instrumentation and equipment to be used;
- Copies of the instruction manuals and the laboratory calibration and test equipment certification;
- The resumes of the vibration monitoring technical support personnel, sufficient to define details of relevant experience;
- Procedures for data collection and analysis;
- Frequency of measurements;
- Means and methods of providing warnings when the specified construction vibration limits are reached; and
- Action plans to be implemented in the event the specified construction vibration limits are reached. The generalized plans of action shall comprise the positive measures by the Contractor to control vibrations using alternative construction methods.

456. Vibration Monitoring - The Contractor shall establish a vibration monitoring and control system in accordance with the CVMP approved by the Engineer, and measure vibrations resulting from its construction operations at predetermined points, in accordance with the CVMP.

457. The Contractor shall monitor vibration during significant vibration- producing construction activities as determined by the Engineer. This monitoring shall consist of a continuous recording of the maximum single-component peak particle velocities for one-minute intervals. During the monitoring, the Contractor shall document all events that are responsible for the measured vibration levels and submit the documentation to the Engineer.

458. All vibration monitoring data shall be recorded contemporaneously and plotted continuously on a graph by the data acquisition equipment. Each graph shall show time- domain wave traces (particle velocity versus time) for each measurement location with the same vertical and horizontal axes scale.

459. Claims for Construction Vibration Damages – Claims for damage caused by vibration shall be handled through the Project Grievance Redress Mechanism (GRM), which is described in Section H.3 - Grievance Mechanism.

460. Alternative Construction Methods - Where the results of the vibration monitoring show that the specified construction vibration limit is reached at a particular location, the Contractor shall suspend the construction activities that generate the excessive vibration at such location, notify the Engineer and with the approval of the Engineer take mitigative actions necessary to keep the construction vibration within the specified limit. This may, for example include the use of low roller vibration settings and performing compaction without vibration.

461. Performance Standards – To ensure vibration is kept within acceptable limits, the following vibration standards shall be complied with throughout the construction phase:

- **Vibratory Rollers not to produce more than PPV 5 mm/s if working within 10 meters of properties.**

- **Vibratory Rollers to be prohibited from working within 3 meters from the façade of any building.**
- **General construction activities not to exceed PPV of 5 mm/s.**

Residual Impacts

Construction Phase – ***MINOR/MODERATE***

Despite the fact that comprehensive mitigation measures have been set to manage construction vibration there may still be instances where cosmetic damage may occur. In the event impacts do occur they will be managed through the Project GRM. In addition, the procedures outlined above provide measures to review and change construction methods based on monitoring results during construction.

Operational Phase – ***NONE***

No residual impacts from vibration are anticipated.

F.9.7 Noise

Potential Construction Noise Impacts

462. The potential noise related issue during construction of the project is disturbance to sensitive receptors in the Project area.

463. Noise levels within the Project area range depending upon the location. Baseline noise monitoring undertaken for this IEE indicates that noise levels range from 41 to 55 dBA at the façade of properties within the Project corridor.

464. The noise during the construction phase depends on the stage of construction work and equipment used at the site. The construction activities generating significant levels of noise can be divided as follows:
(i) Site clearing and preparation;
(ii) Excavation works;
(iii) Bored piling and concrete placement; and
(iv) Erection of bridges.

465. The main sources of noise and vibration during construction of the project are as follows:
(i) Construction machinery;
(ii) Drilling activities;
(iii) Haulage and general vehicle movements;
(iv) Concrete mixing and aggregate production systems; and
(v) Construction Camps / Ancillary Facilities.

466. The criteria for Determining Significance is the World Bank Group guidelines for noise require that the sound level in residential areas (and other sensitive receptors, such as schools and hospitals) should not exceed 55 dB(A) during the day and 45 dB(A) during the night. During construction period, it is possible that these standards will be exceeded for short duration during the day.

467. Construction noise levels at receptors would fluctuate depending on the type and number of equipment, their duration of use and the distance from receptor. In this analysis, first the noise level due to each piece of equipment, which is likely to be used in the construction, is calculated. The peak noise levels of construction equipment mainly used at a typical construction site, are shown in Table 38. The list includes all equipment except vehicles and some minor pieces of equipment.

Table 38: Typical Noise Levels from Construction Equipment

Equipment	Actual Max (dBA)	Usage Factor (%)
Roads – Preparation Stage		
Dozer	81.7	30
Excavator	80.7	30
Grader	85	30
Roller	80.0	15
Rock Drill	81.0	15
Dump Truck	76.5	30
Roads - Completion stage		
Compressor	77.2	30
Paver	77.2	30
Roller	80.0	15
Tractor	84.0	30
Concrete Mixer Truck	78.8	30
Tunnel Mouth		
Jackhammer	88.9	50
Tunnel		
Blasting	94.0	1
Bridge		
Boring Jack Power Unit	83.0	20

Source: Source: Batumi Bypass EIA. ADB 2017.

468. Using this data, the expected noise level, Leq(8-hr), is calculated. The predicted noise levels at 100 m from the source are shown in the table below. It shows that the highest equivalent noise level for an 8-hour shift due to a single piece of equipment at a receptor, at a typical distance of 100 m from the source will be about 61 dB(A) during preparation stage. When more than one piece of equipment are working simultaneously, the noise level at the receptor will increase. The attenuation due to topographic factors could be up to 2 dB(A). Good maintenance of equipment with installation of noise mufflers may also reduce the noise.

Table 39: Predicted Noise Level for Construction Equipment (dBA)

Equipment	Actual Max	Usage Factor (%)	Leq (dBA) at Various Distance					
			50m	100m	200m	300m	400m	500m
Road – Preparation Stage								
Dozer	81.7	30	64.2	58.1	52.1	48.6	46.1	44.2
Excavator	80.7	30	63.2	57.1	51.1	47.6	45.1	43.2
Grader	85	30	67.5	61.4	55.4	51.9	49.4	47.5
Roller	80.0	15	59.4	53.4	47.4	43.9	41.4	39.4
Rock Drill	81.0	15	60.4	54.4	48.4	44.9	42.4	40.4
Dump Truck	76.5	30	59.0	52.9	46.9	43.4	40.9	39.0
Cumulative			71.3	65.1	59.1	55.6	53.1	51.2
Road – Completion Stage								
Compressor	77.2	30	60.2	54.1	48.1	44.6	42.1	40.2

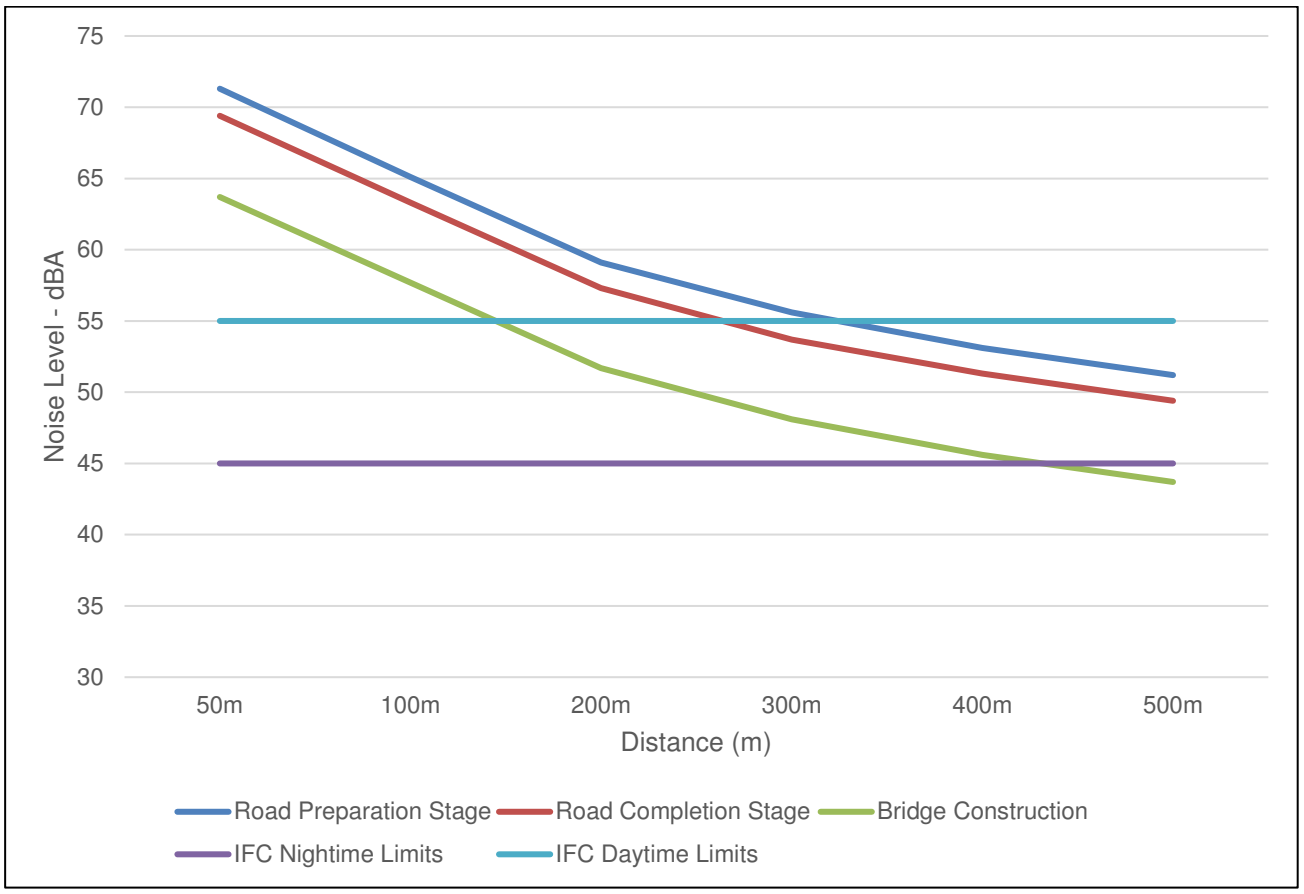
Equipment	Actual Max	Usage Factor (%)	Leq (dBA) at Various Distance					
			50m	100m	200m	300m	400m	500m
Paver	77.2	30	59.7	53.6	47.6	44.1	41.6	39.7
Roller	80.0	15	59.4	53.4	47.4	43.9	41.4	39.4
Tractor	84.0	30	66.5	60.4	54.4	50.9	48.4	46.5
Concrete Mixer Truck	78.8	30	61.3	55.2	49.2	45.7	43.2	41.3
Cumulative			69.4	63.3	57.3	53.7	51.3	49.4
Bridge								
Boring Jack Power Unit	83.0	20	63.7	57.7	51.7	48.1	45.6	43.7
Cumulative	83.0	20	63.7	57.7	51.7	48.1	45.6	43.7

469. For a more detailed impact assessment, the construction noise was calculated at distances starting from 50 m to 500 m to see the extent of spreading of noise and separately for different construction phases. The results for construction noise are shown in Figure 25**.** Following assumptions were made during calculation:

(i) It was assumed that the equipment working simultaneously in preparation stage are; dozer, excavator, grader, road roller, rock drill and dumpers whereas in completion stage the equipment are; compressor, paver, road roller, tractor and concrete mixers.

(ii) The estimated shielding was taken as 2 dBA. Shielding is the reduction in noise due to addition of mitigation measures like barriers and dirt mound.

Figure 25: Construction Noise



470. It can be seen that in general construction activities will result in elevated noise levels over quite a wide distance, as much as 200-300 meters. However, much of the project corridor is uninhabited, or bypasses the major towns within the alignment and therefore there will be no impacts to sensitive receptors in these areas. Even in the areas where the road passes villages, such as Tamdy, the road is more than 300-400 meters from these villages which are also often set back behind rows of vegetation and the railway embankment which would further limit noise impacts.

471. There are in fact only three locations where construction noise is likely to impact upon sensitive receptors. The first is at the start of the Project road between KM0.0 and KM0.5 where a row of approximately eight homes are located within 30 meters of the edge of the eastern side of the existing road. The second is in Bestamak where the Project road will pass directly through with residential and commercial properties in both side of the road, and the third is the town of Alga, but this only refers to the rehabilitation of the existing pavement through the town. Each of these areas are examined in more detail as follows. It is also important to note than none of the bridges planned for construction are located near residential areas.

472. **KM0.0 – KM0.5** – Ambient noise monitoring in this area was undertaken in September 2018. The results showed that noise levels ranged from 38 dBA during the night to 53 dBA during the day at the façade of the building, more or less compliant in all instances with IFC daytime and nightime standards. The planned construction works at a distance of 50 meters would result in noise levels around 70 dBA. It is noted that all of the properties in this area are set behind a boundary wall which screens them from the road noise. Accordingly, this screen would also reduce noise levels from

construction works. To assess the significance of the construction phase noise British Standard (Code of practice for noise and vibration control on construction and open sites – Part 1: Noise) has been used, specifically the 'ABC' method. Daytime noise average at this location is 50 dBA, average nightime noise, 42 dBA. Rounding to the nearest 5 the results are 50 dBA for daytime and 40 dBA for nightime. According to the ABC method, 45 dBA would be the threshold value for potentially significant impacts during the nightime and 65 dBA would be the threshold value for potentially significant impacts. This means that any construction works would far exceed the threshold value for nightime noise and would also be above the daytime limits. However, a specific condition for this Project will be to prohibit construction works in residential areas during the nightime period, so there will be no impacts during this period. As noted above the properties in this area are have a boundary wall between the property and the road. Factoring in this wall as a barrier to noise the levels could reduce between 3 and 5 dBA. This would mean that the construction noise at the façade of the properties could in fact be around 65 dBA which is the threshold for daytime noise using the ABC methodology.

473. **Bestamak –** Bestamak has residential properties on both sides of the road. The properties range from 15 to 20 meters from the roadside. The average ambient nightime noise levels measured are 43 dBA and the average daytime noise levels are 51 dBA. According to the ABC method, 45 dBA would be the threshold value for potentially significant impacts during the nightime and 65 dBA would be the threshold value for potentially significant impacts. This also means that any construction works would far exceed the threshold value for nightime noise and would also be above the daytime limits. However, a specific condition for this Project will be to prohibit construction works in residential areas during the nightime period, so there will be no impacts during this period. As noted above the properties in this area are have a boundary wall between the property and the road. Factoring in this wall as a barrier to noise the noise levels could reduce between 3 and 5 dBA. This would mean that the construction noise at the façade of the properties could in fact be around 65 dBA which is the threshold for daytime noise using the ABC methodology. The commercial properties in Bestamak are not sensitive receptors, the IFC limit for these receptors is 70 dBA.

474. **Alga** – in this area only rehabilitation of the existing pavement is planned. That will included milling of the exiting asphalt and relaying a new asphalt surface. The milling activities are fairly quick and will be limited to just a few days within a specific location. Other activities, such as the asphalt laying can also be achieved within a couple of days and as such any elevated noise levels in Alga will be very short term and localized.

Operational Phase Noise Impacts

475. The Project road, once operational, passes mainly through unoccupied land. Once the road is completed bypasses will also exist around Alga and Kandyagash. Accordingly the only residential areas that maybe affected by elevated noise levels are KM 0.0 to KM 0.5 and Bestamak.

476. Kazavtozhol decided to pre-empt any potential operational noise impacts in Bestamak by including 3m high noise barriers through the town on both sides of the road as part of the detailed design (see Figure 9 for the road cross section and noise barrier location).

477. To confirm if the noise barriers were actually needed, and if they would be effective in these areas a noise model was prepared by international consultants using the Software Soundplan.

478. The results of the model are shown in two forms, firstly via a series of maps which illustrate how the road noise propagates in the affected areas, and secondly via precise noise data for specific receptors within the Project area.

479. The model accounts for daytime and nightime periods and has been run for three time periods, 2020 when the road becomes operational, 2030 and 2040.

480. The analysis will focus firstly on KM0.0 – KM0.5, and then Bestamak

KM0.0 – KM0.5 Model Results

Figure 26: KM0.0 – KM0.5, 2020, Daytime without Noise Barrier

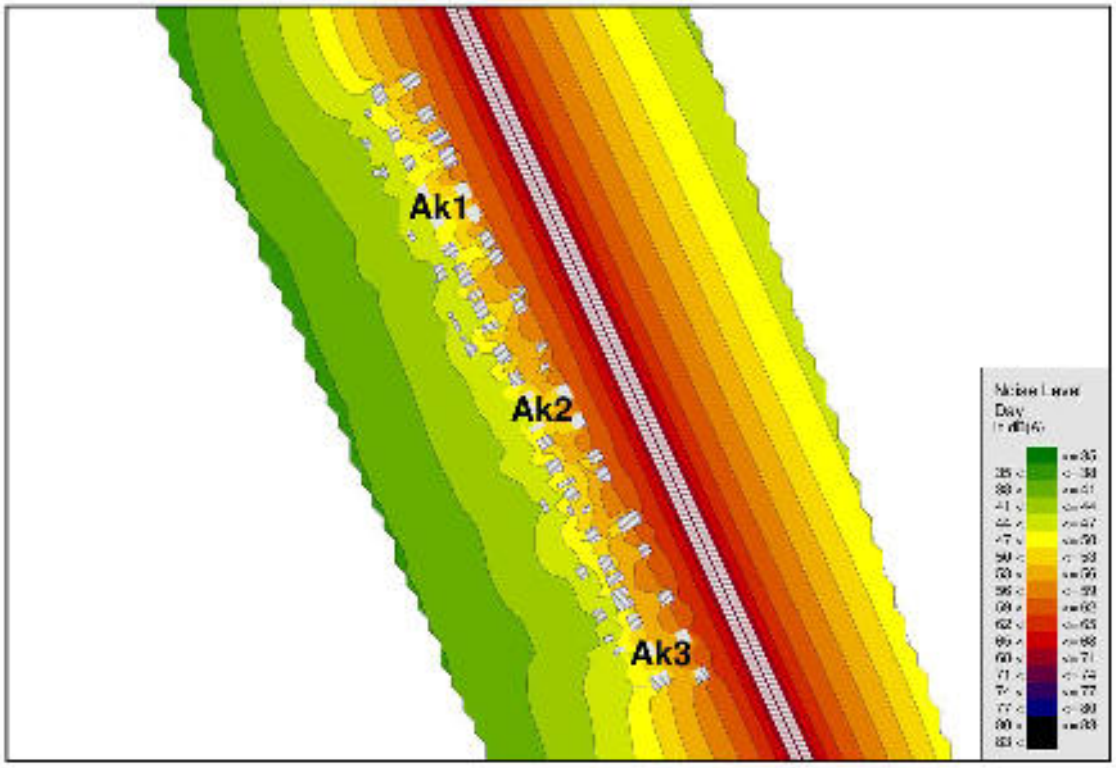


Figure 27: KM0.0 – KM0.5, 2020, Daytime with Noise Barrier

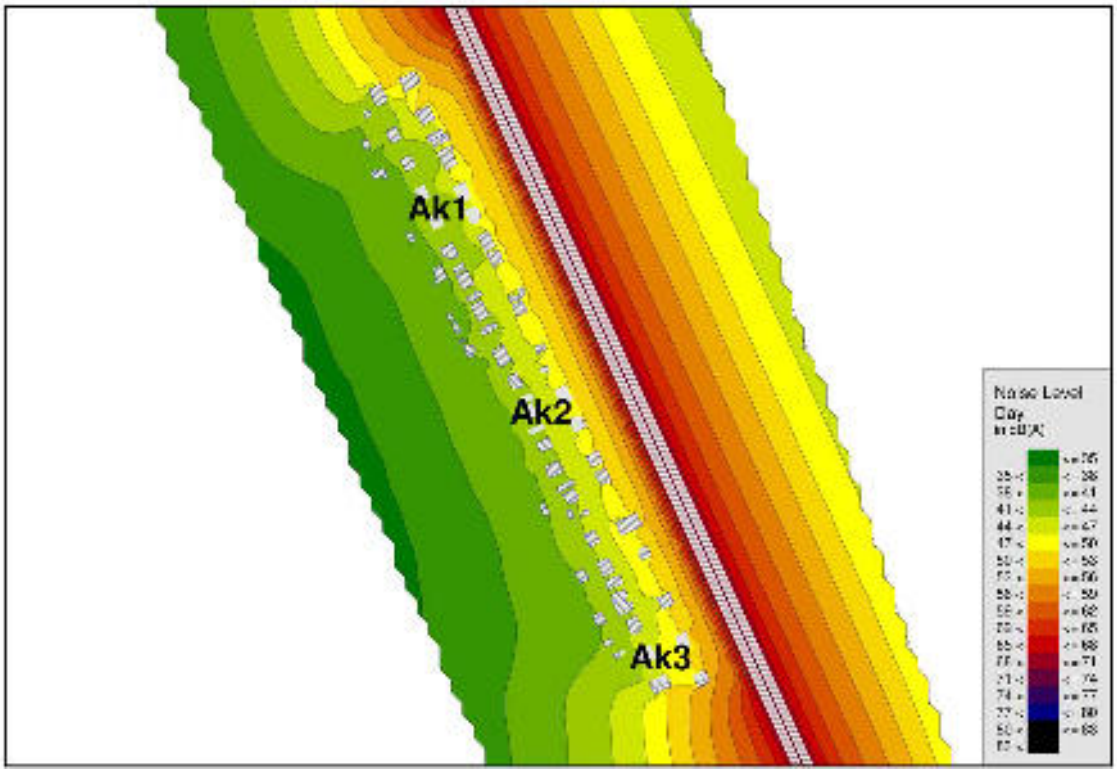


Figure 28: KM0.0 – KM0.5, 2020, Nightime without Noise Barrier

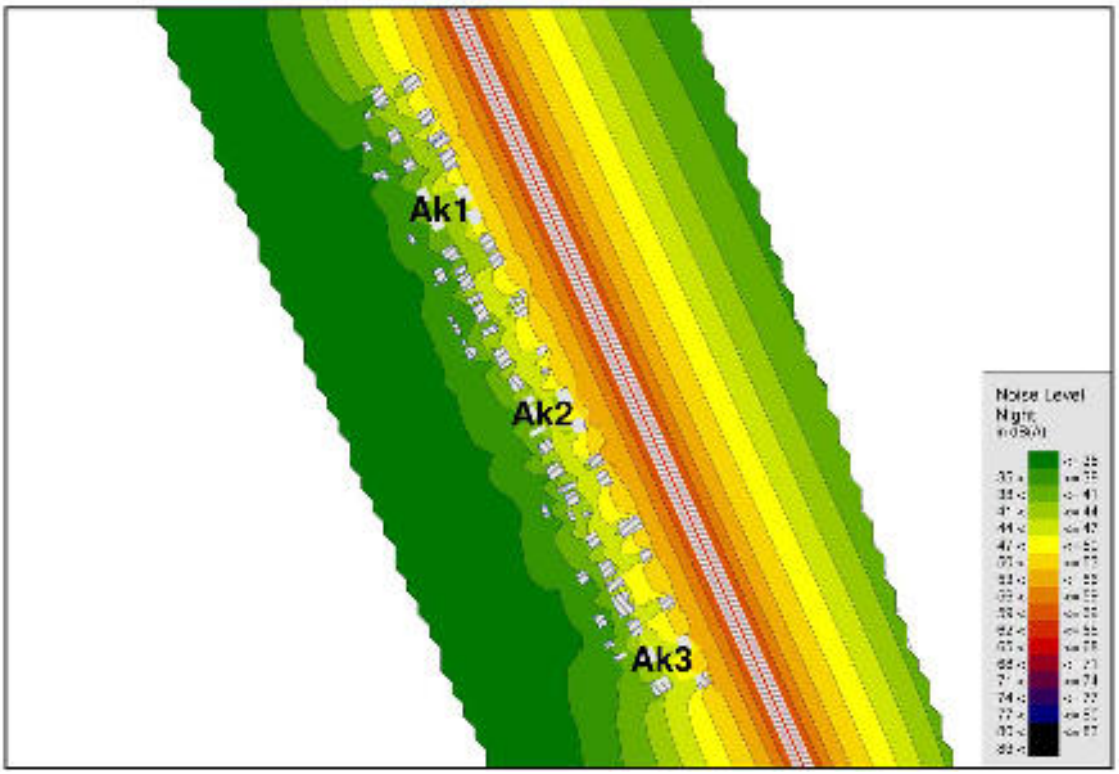


Figure 29: KM0.0 – KM0.5, 2020, Night time with Noise Barrier

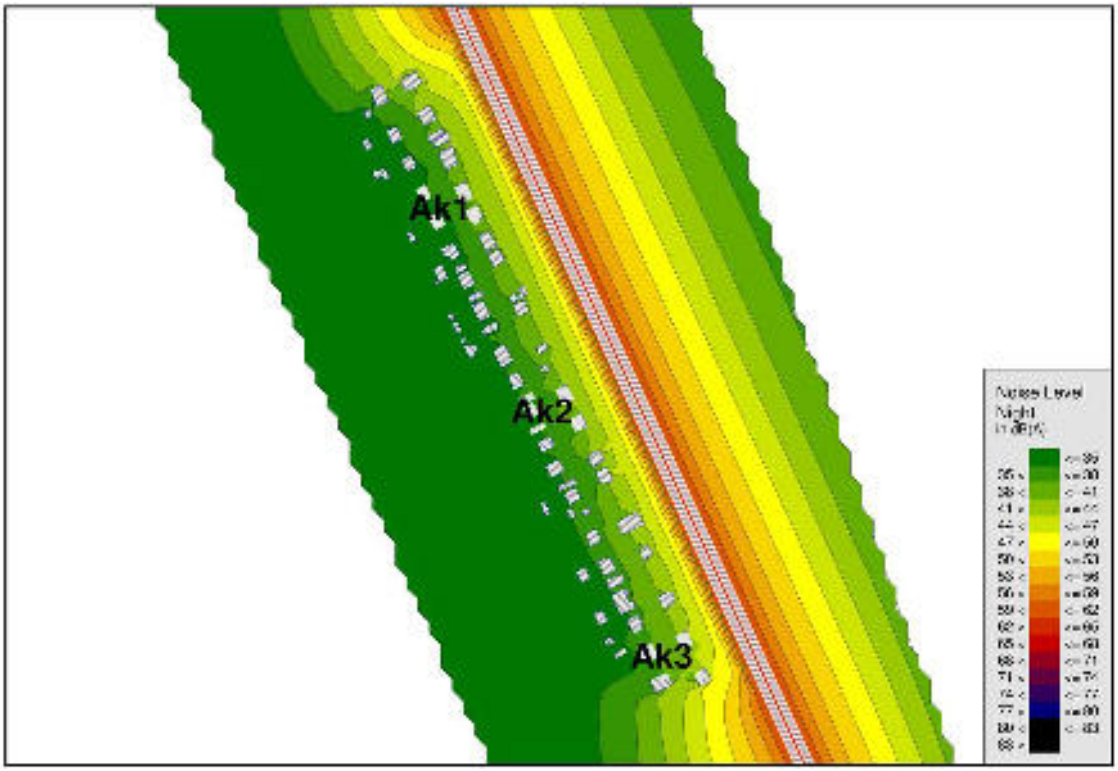


Figure 30: KM0.0 – KM0.5, 2030, Daytime without Noise Barrier

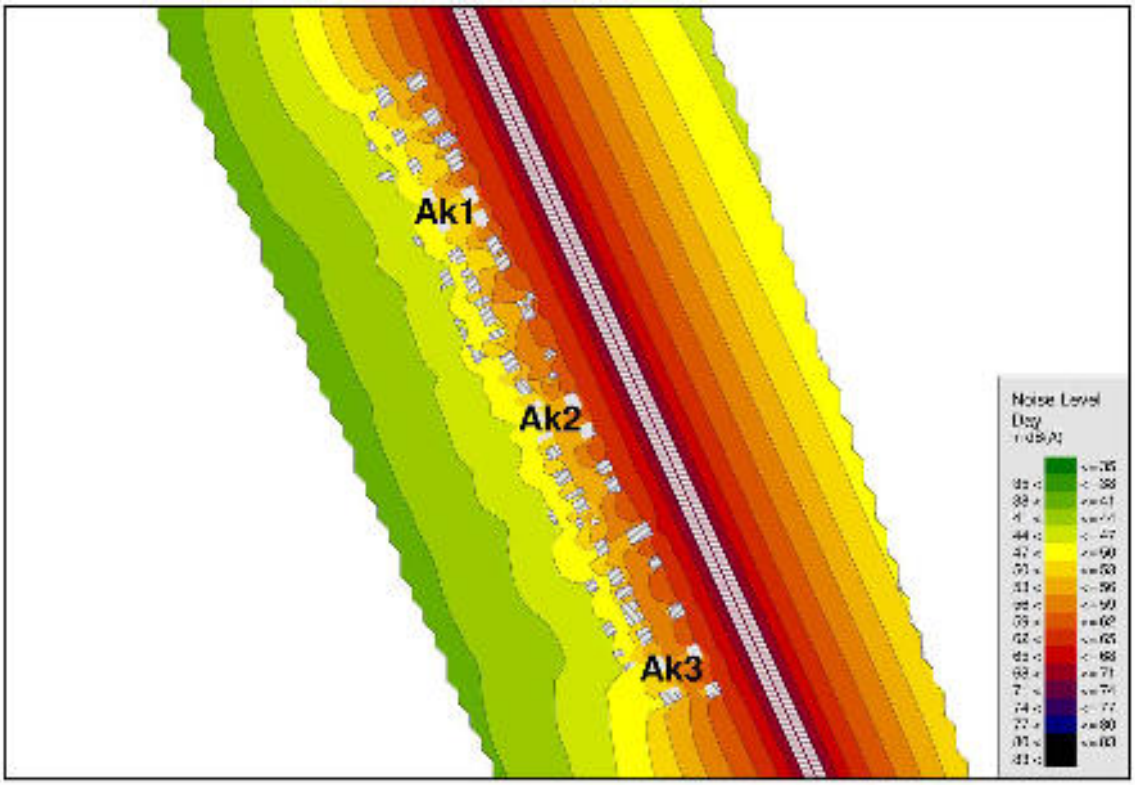


Figure 31: KM0.0 – KM0.5, 2030, Daytime with Noise Barrier

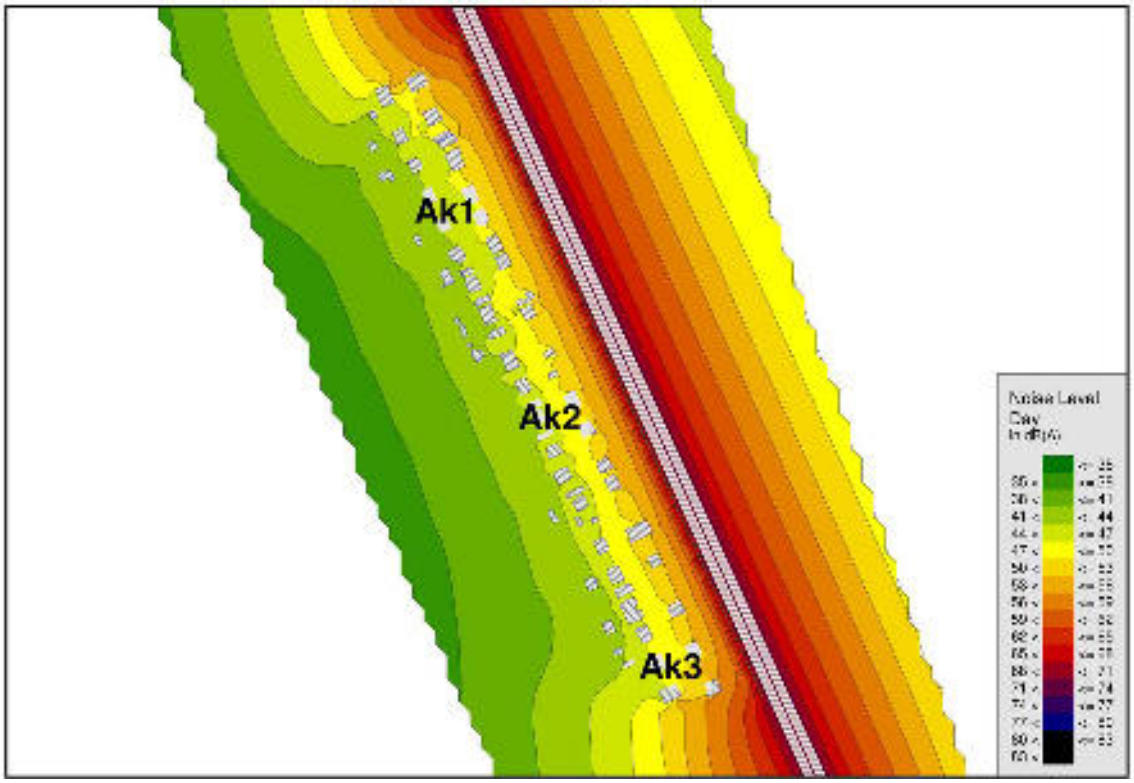


Figure 32: KM0.0 – KM0.5, 2030, Nightime without Noise Barrier

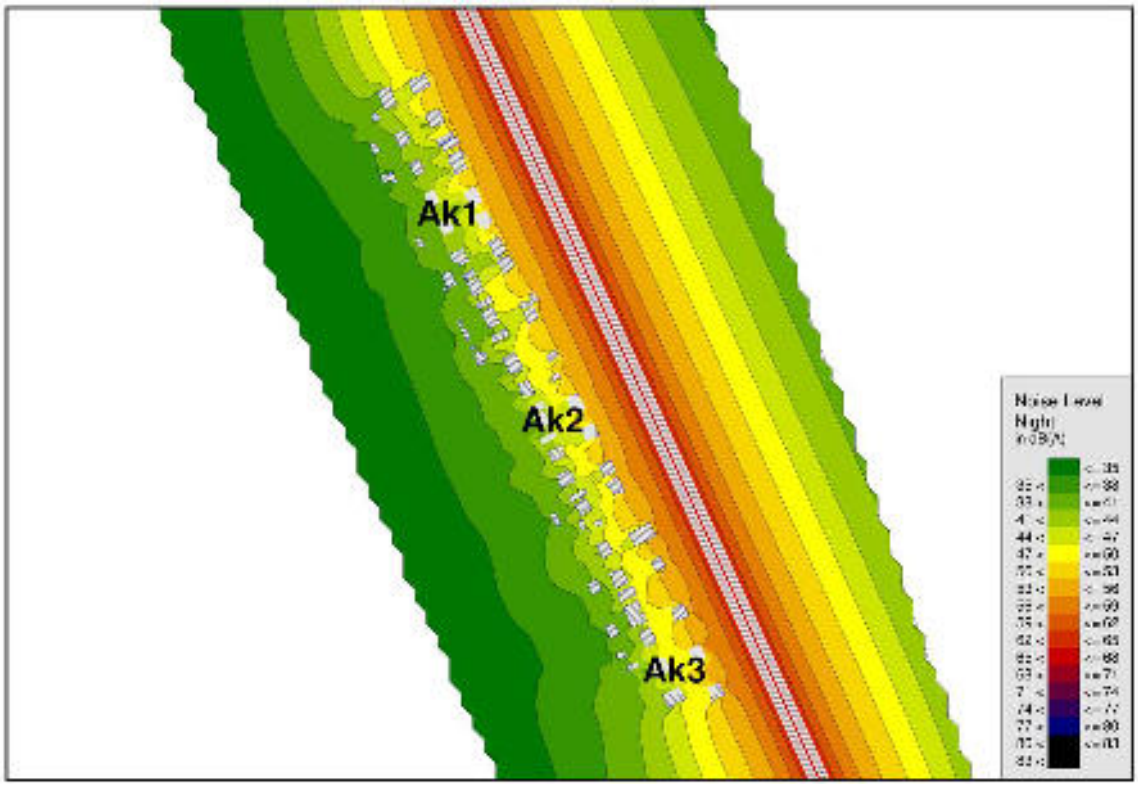


Figure 33: KM0.0 – KM0.5, 2030, Nightime with Noise Barrier

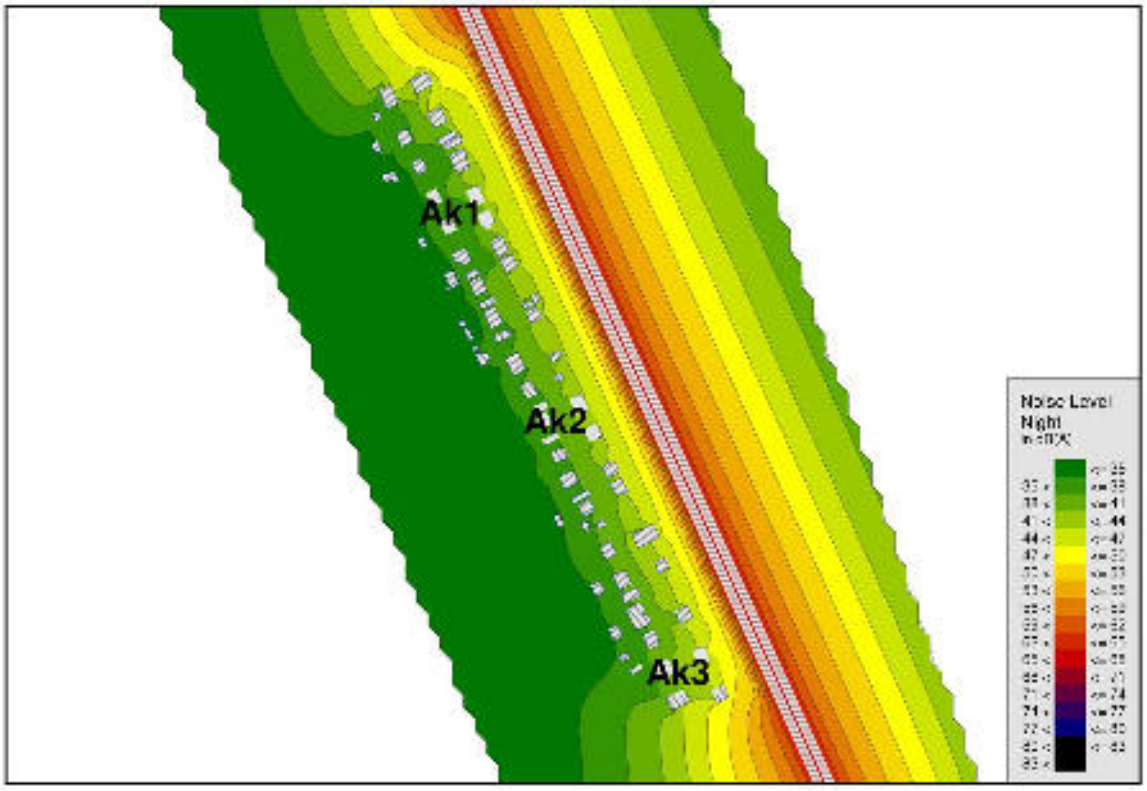


Figure 34: KM0.0 – KM0.5, 2040, Daytime without Noise Barrier

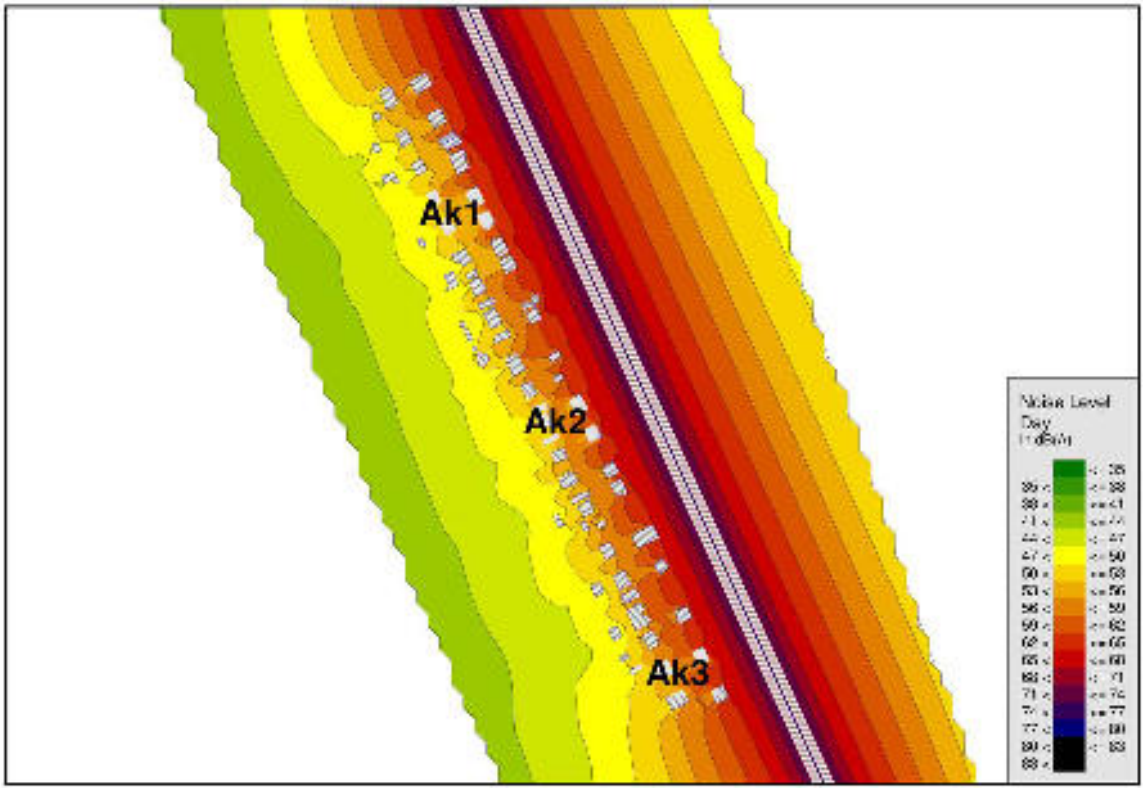


Figure 35: KM0.0 – KM0.5, 2040, Daytime with Noise Barrier

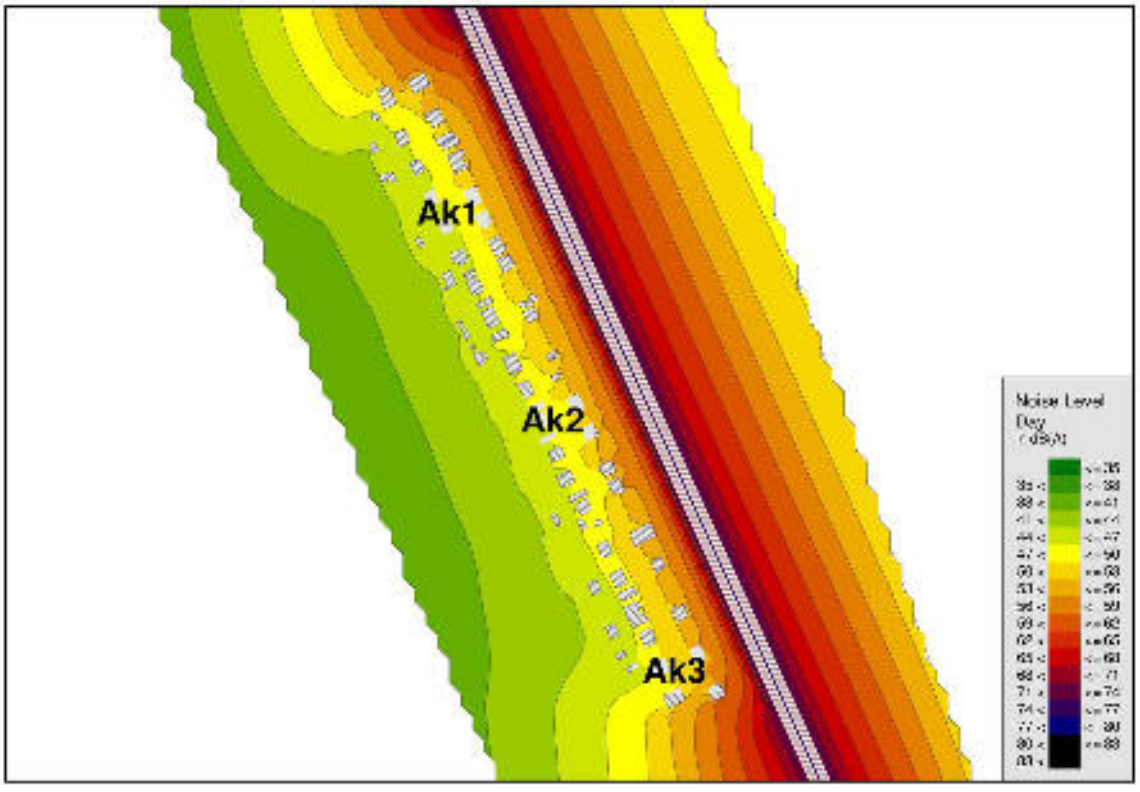


Figure 36: KM0.0 – KM0.5, 2030, Nightime without Noise Barrier

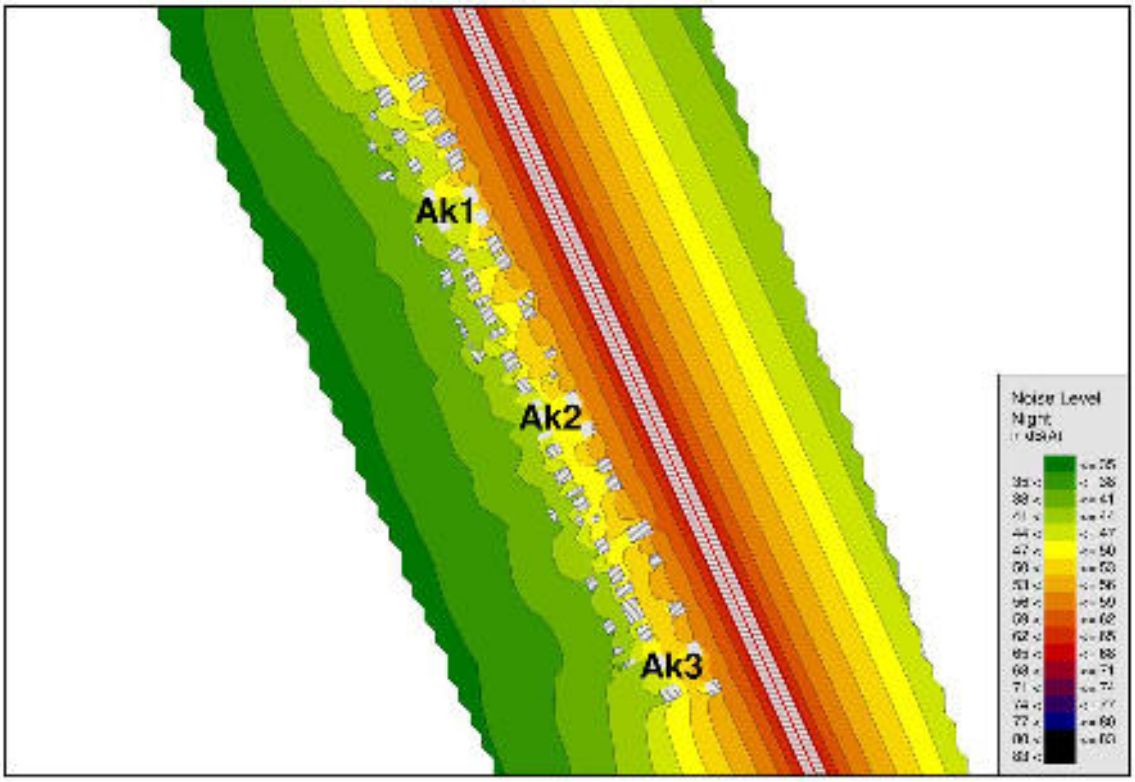
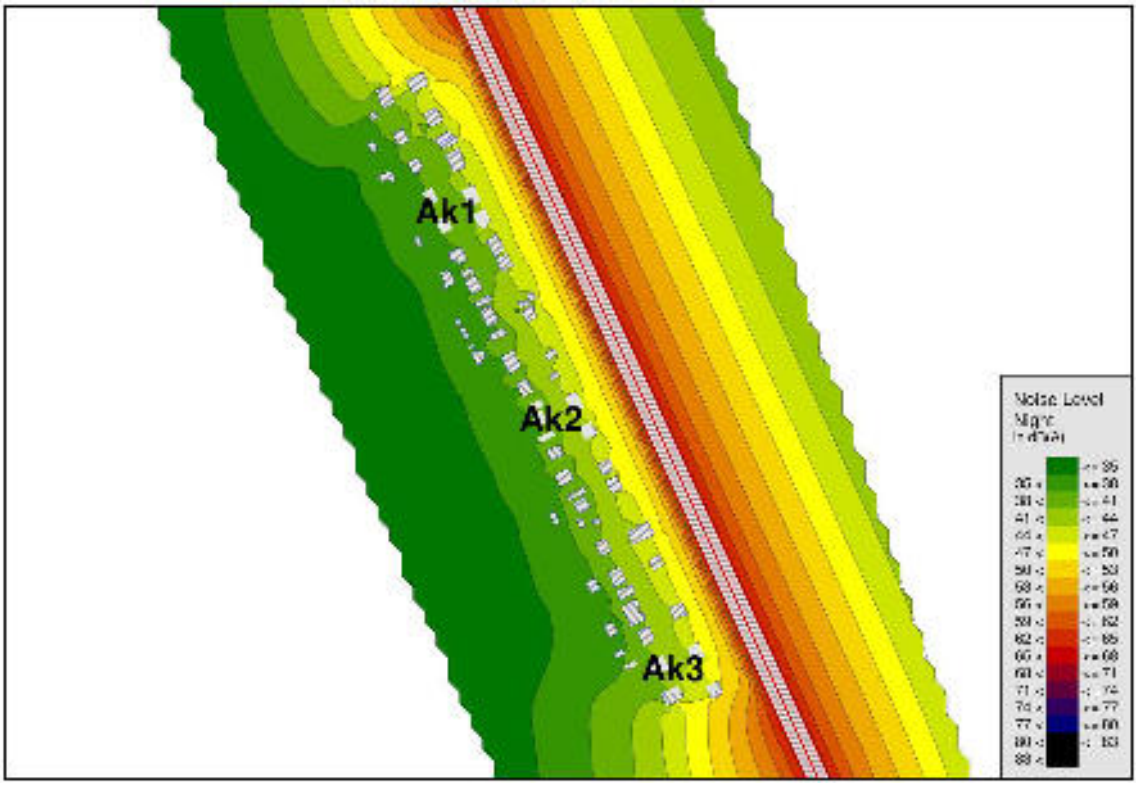


Figure 37: KM0.0 – KM0.5, 2030, Nightime with Noise Barrier



481. Given that the road in this section is straight and flat and the houses of a similar size and composition (all single storey) only three 'receptors' were selected for detailed analysis as they were considered representative of the residential properties in this section. The following table provides the results of the modeling at the facades of these three receptors.

Table 40: Modeling Results, KM0.0-0.5 Receptors

	2020				2030				2040			
	Without Barrier		With Barrier (3m)		Without Barrier		With Barrier (3m)		Without Barrier		With Barrier (3m)	
Receptor	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
Ak1	56	48	49	41	58	50	51	43	60	52	53	45
Ak2	57	49	49	41	59	51	52	44	61	53	54	46
Ak3	58	50	51	43	60	52	53	45	63	55	55	47

482. The results of the model in this section clearly show that the noise barrier is effective at reducing noise levels below IFC guideline limits for daytime and nightime noise and that without the barriers noise levels are predicted to be above the limits for all three receptors (and consequently all of the front line properties in this area). The only exception is the nightime period in 2040 where two receptors will be 1 and 2 dBA above the nightime limit. However, this is not considered a significant impact.

Bestamak Model Results

Figure 38: Bestamak, 2020, Daytime without Noise Barrier

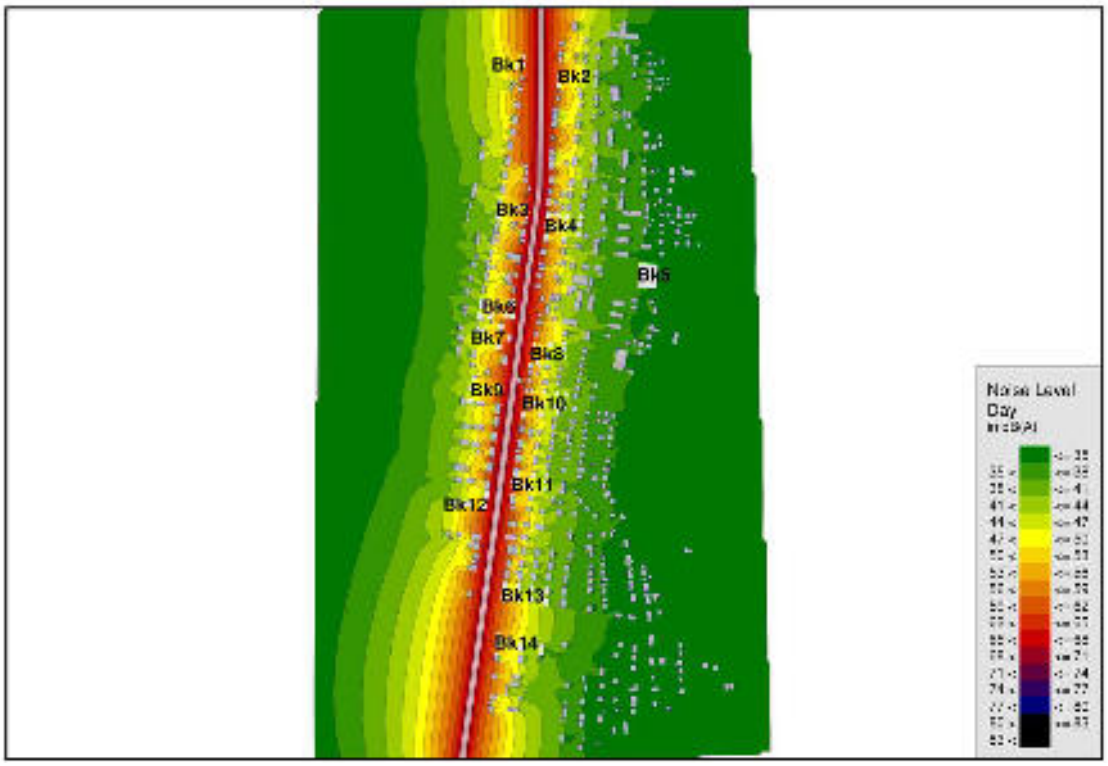


Figure 39: Bestamak, 2020, Daytime with Noise Barrier

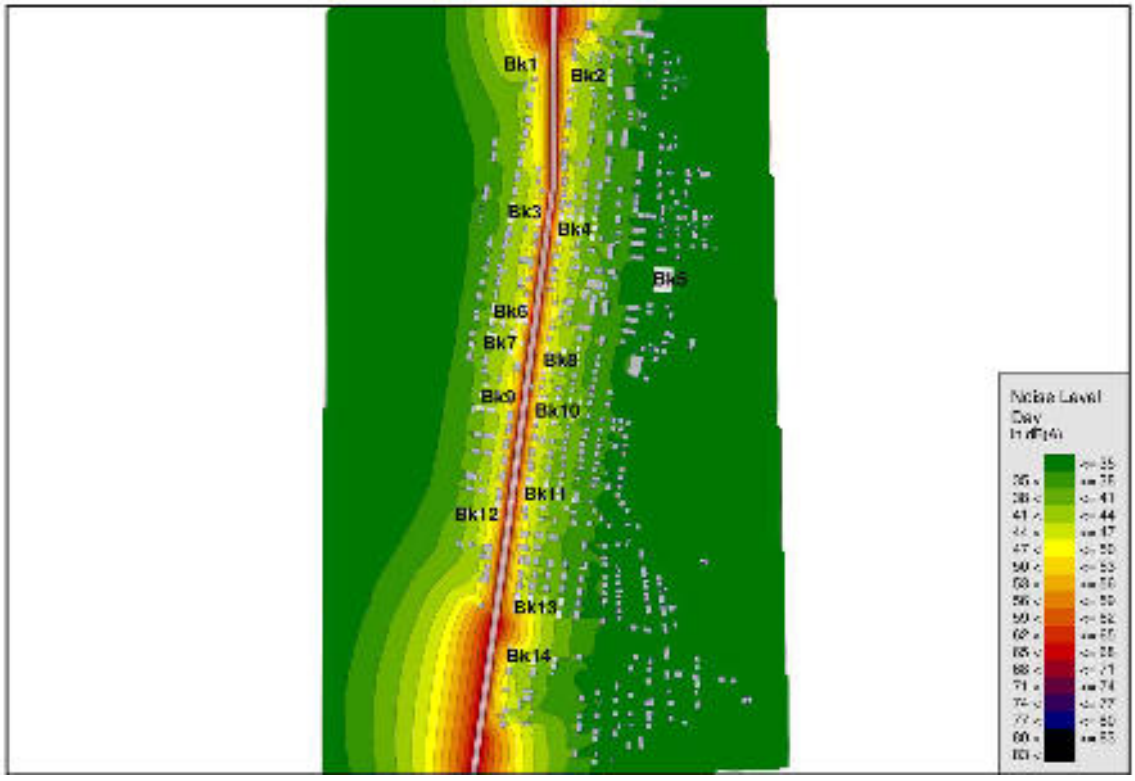


Figure 40: Bestamak, 2020, Nightime without Noise Barrier

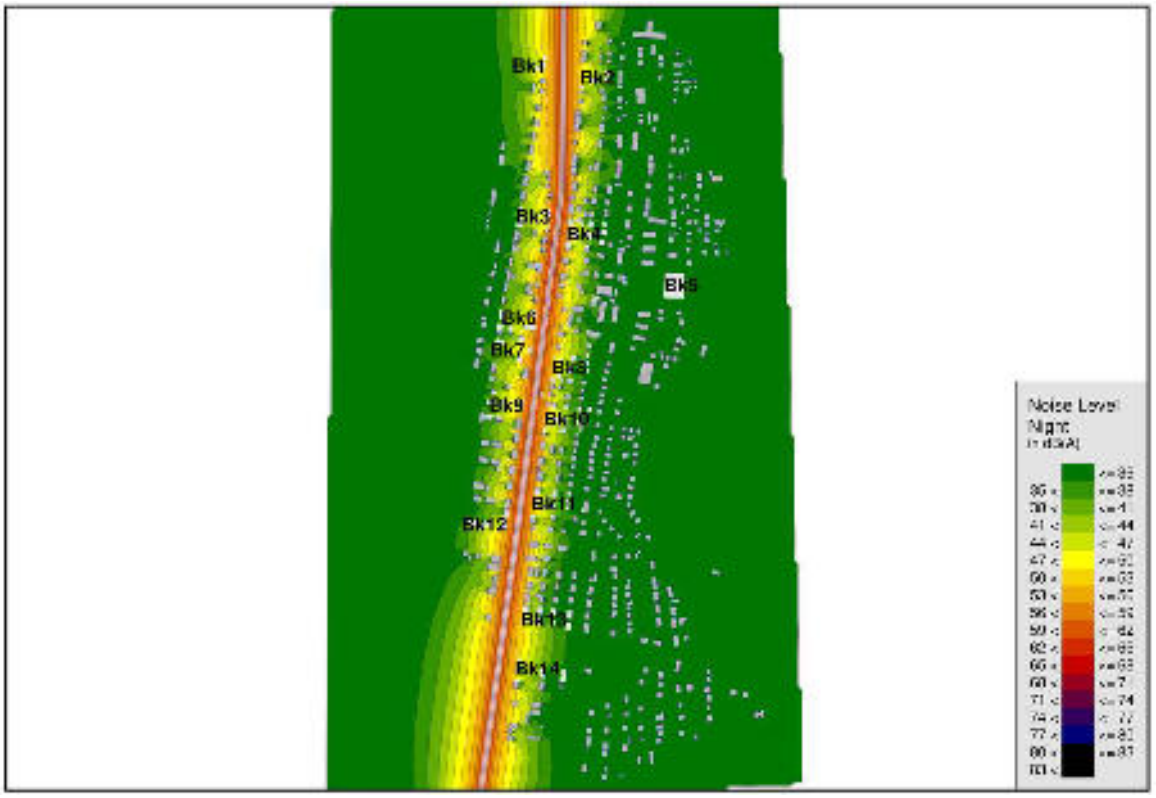


Figure 41: Bestamak, 2020, Night time with Noise Barrier

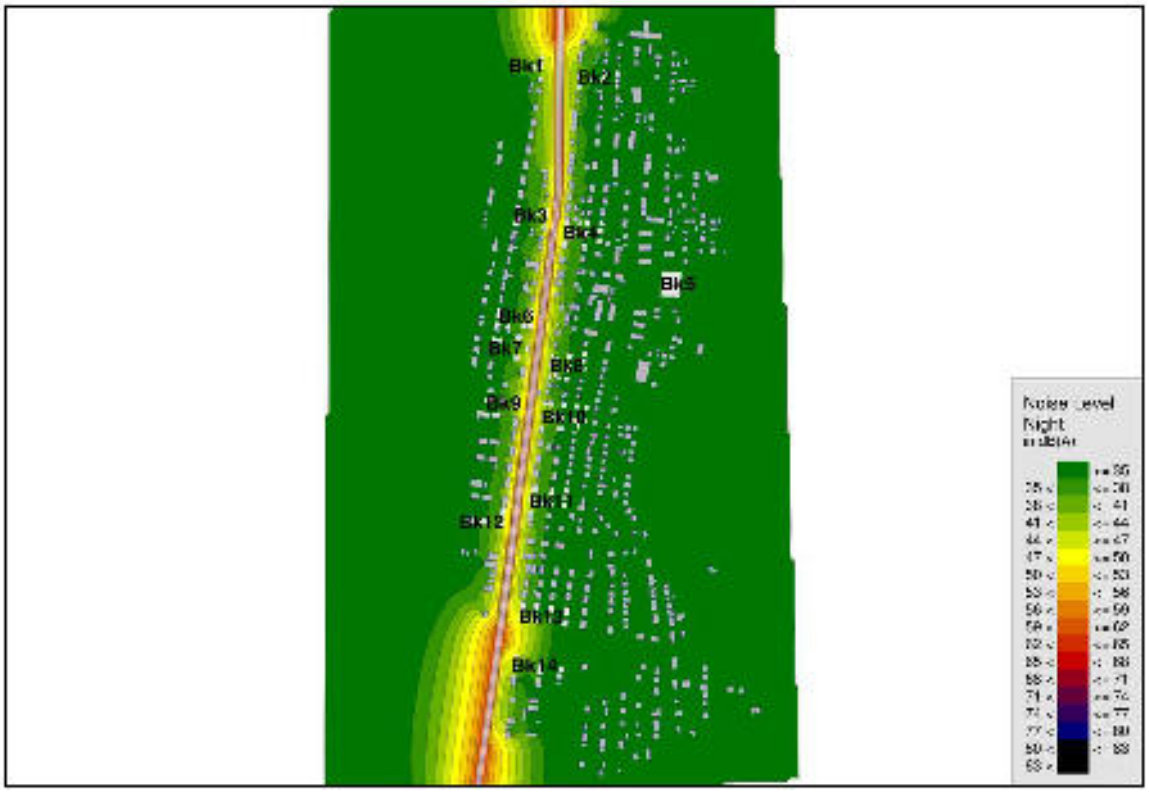


Figure 42: Bestamak, 2030, Daytime without Noise Barrier

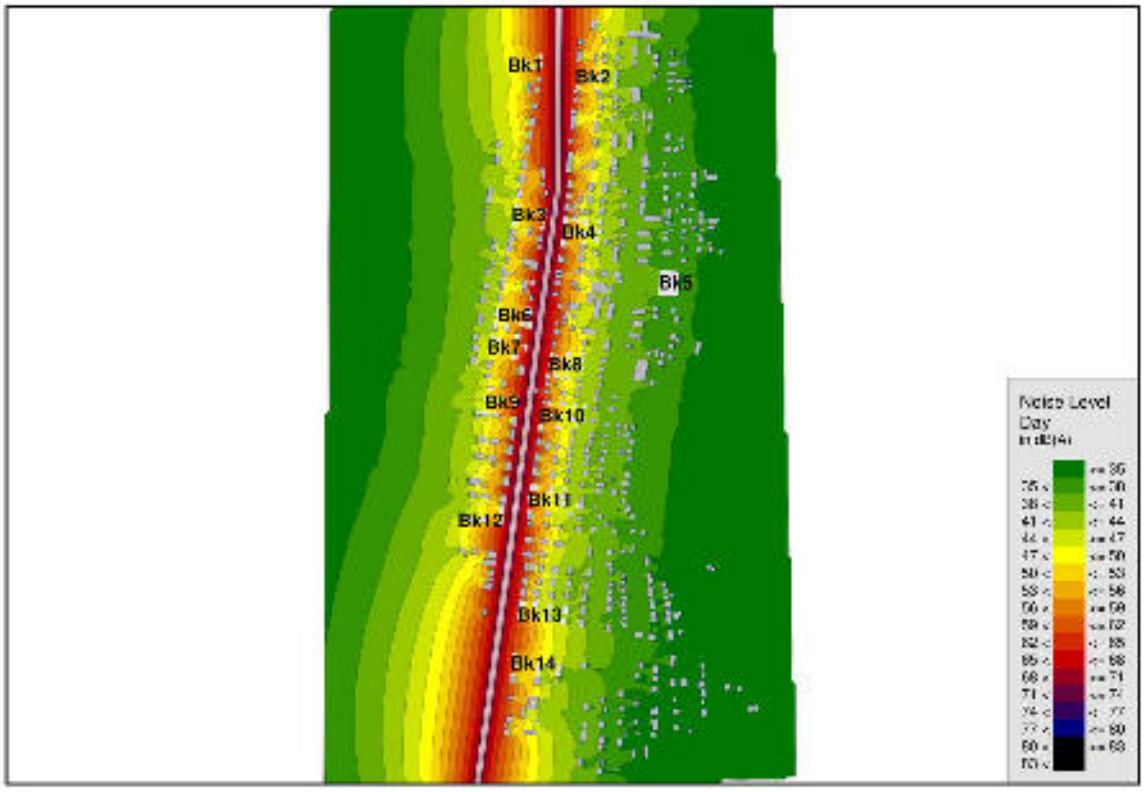


Figure 43: Bestamak, 2030, Daytime with Noise Barrier

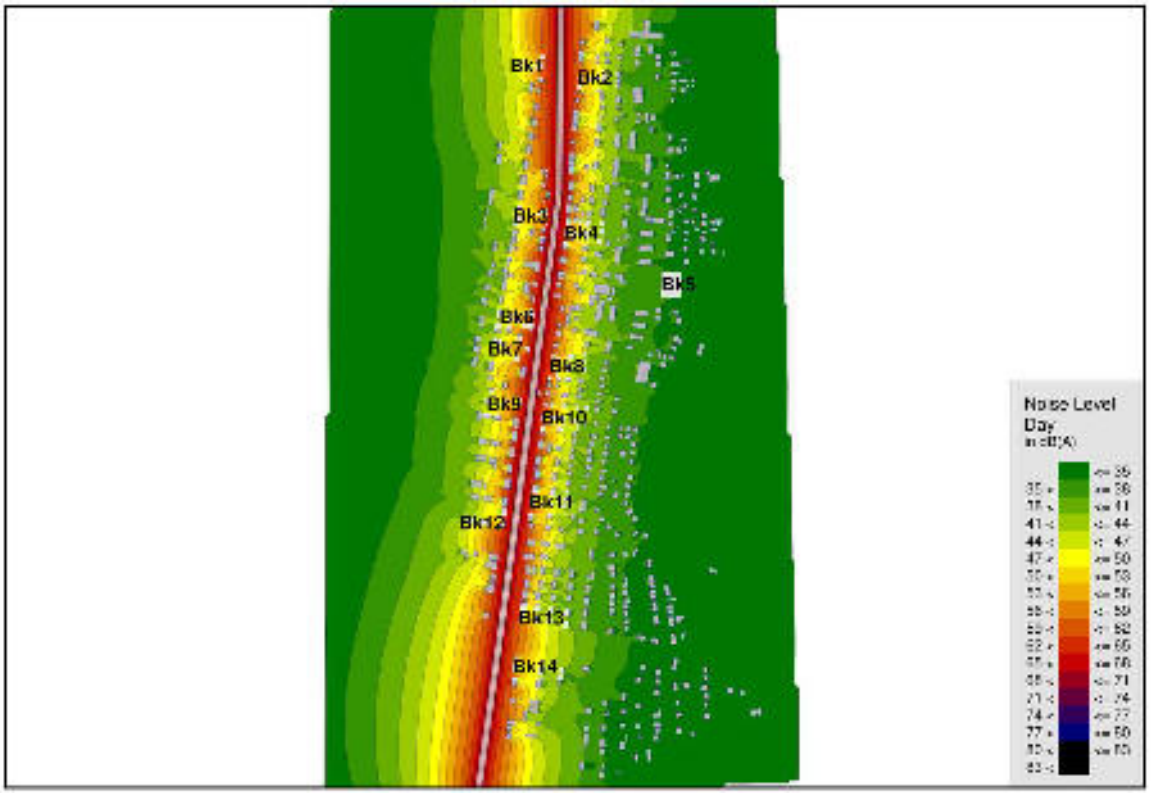


Figure 44: Bestamak, 2030, Nightime without Noise Barrier

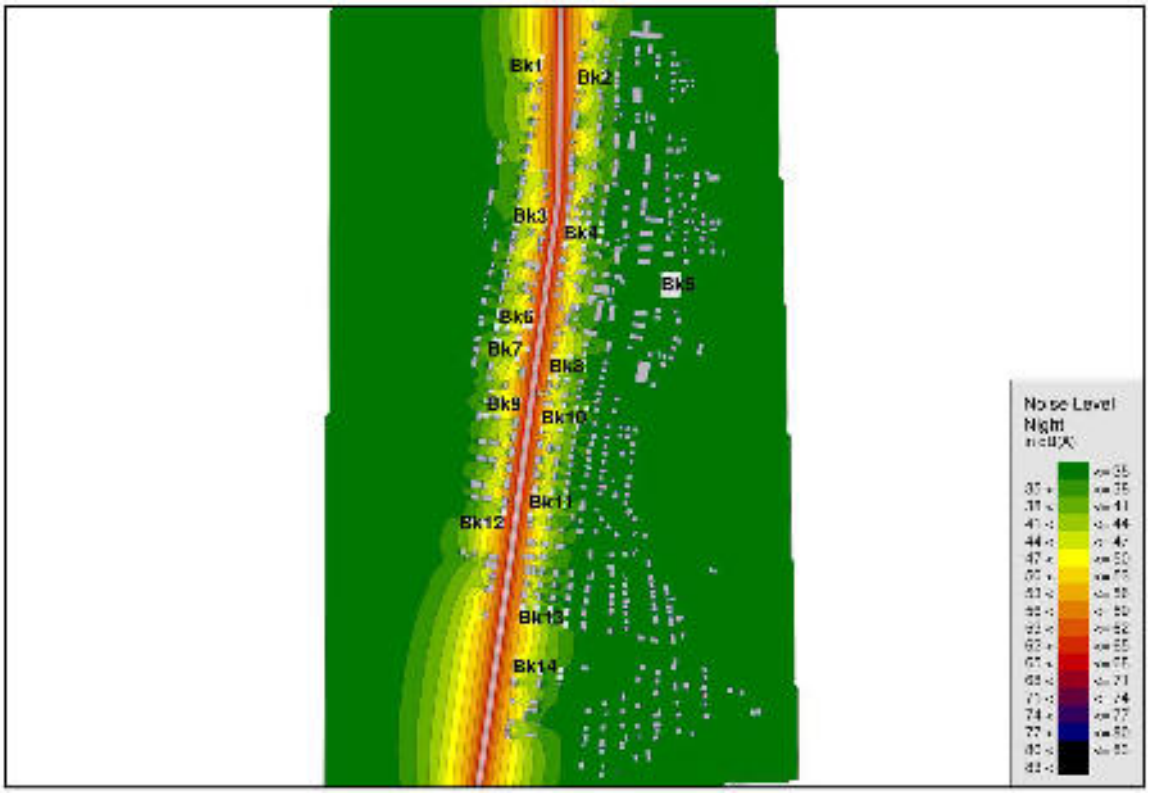


Figure 45: Bestamak, 2030, Nightime with Noise Barrier

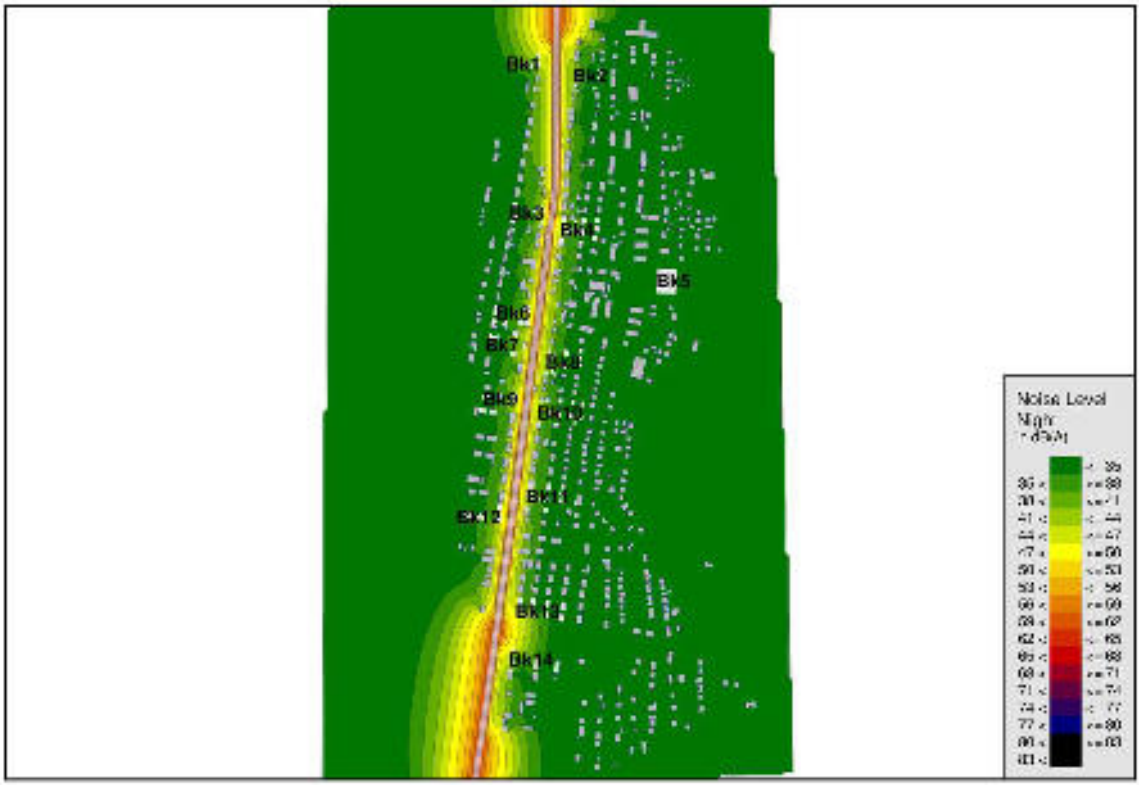


Figure 46: Bestamak, 2040, Daytime without Noise Barrier

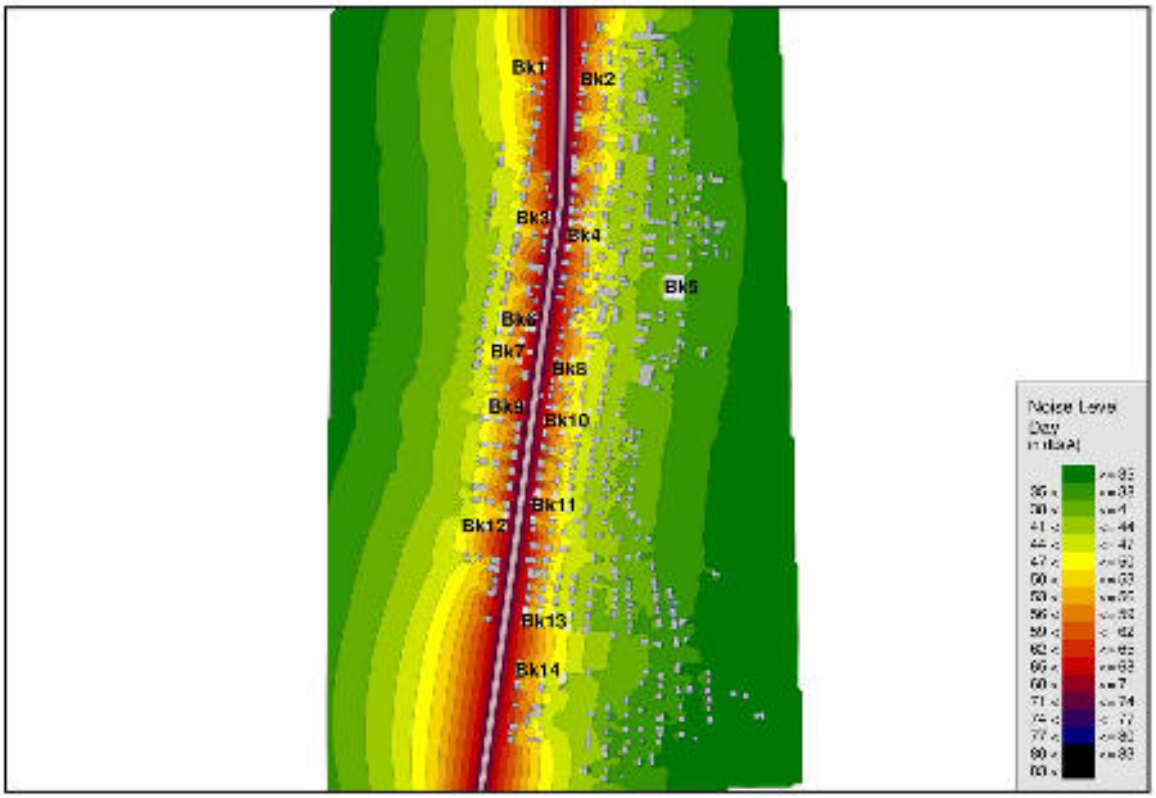


Figure 47: Bestamak, 2040, Daytime with Noise Barrier

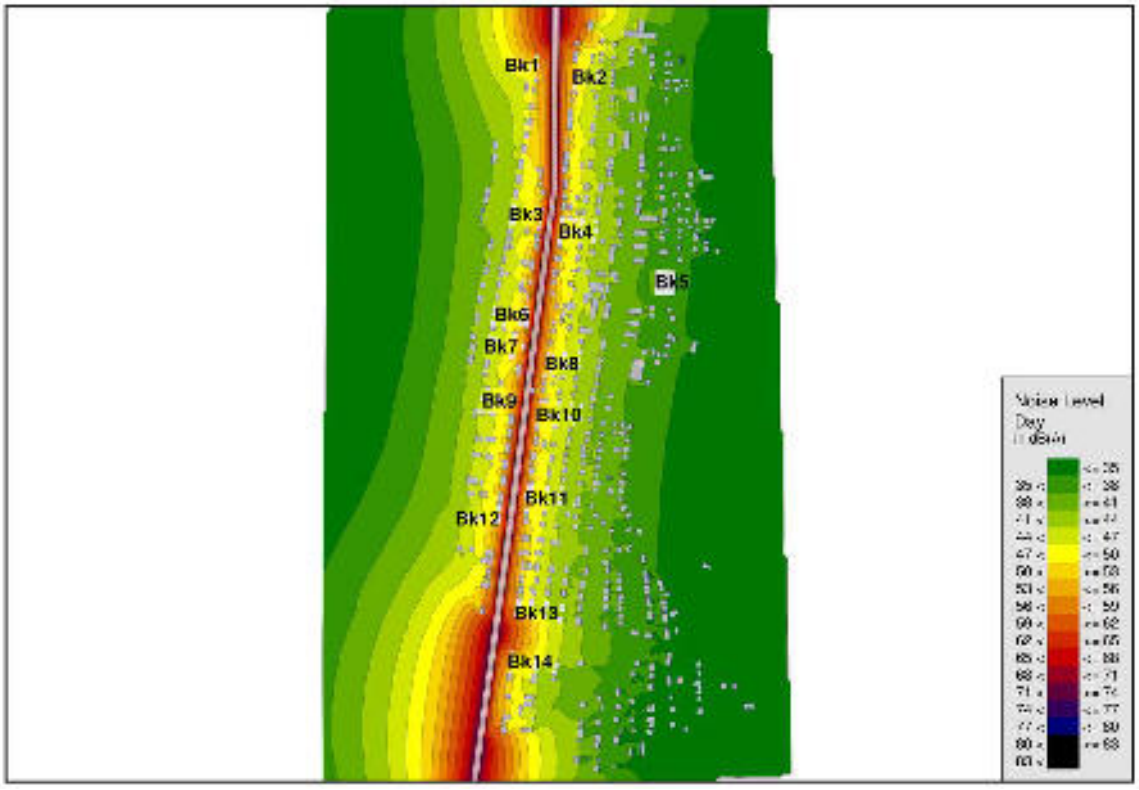


Figure 48: Bestamak, 2030, Nightime without Noise Barrier

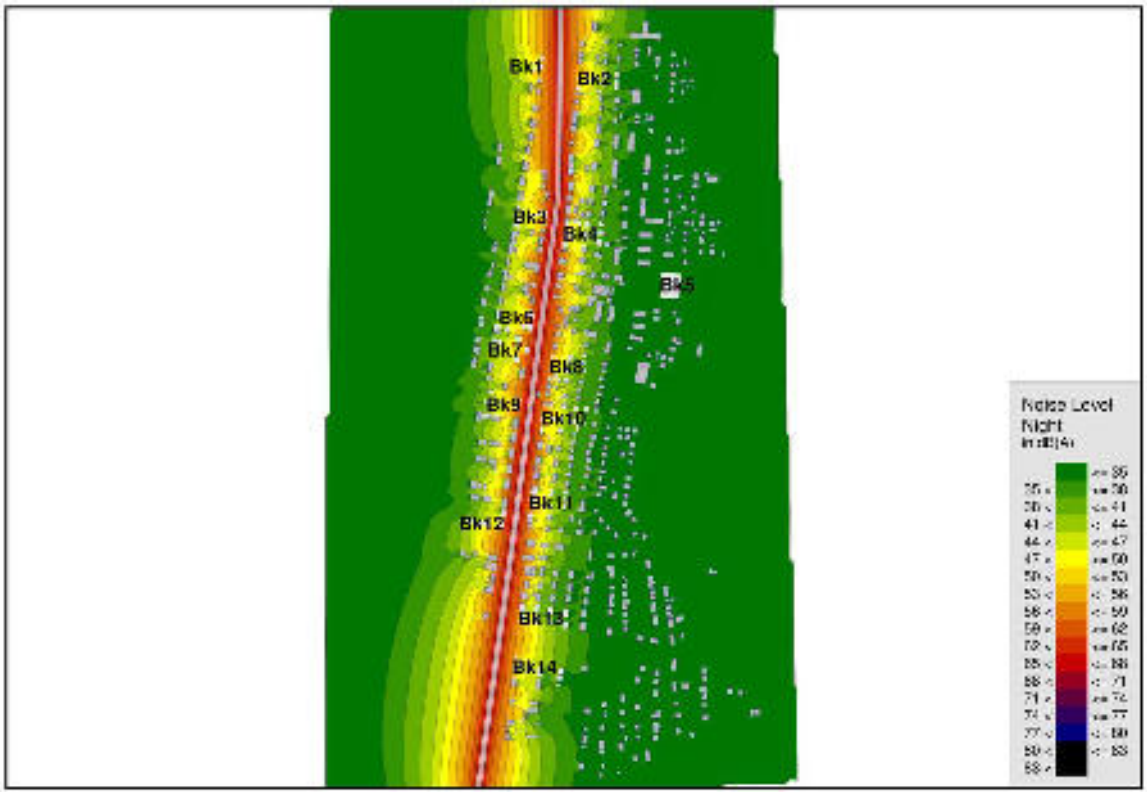
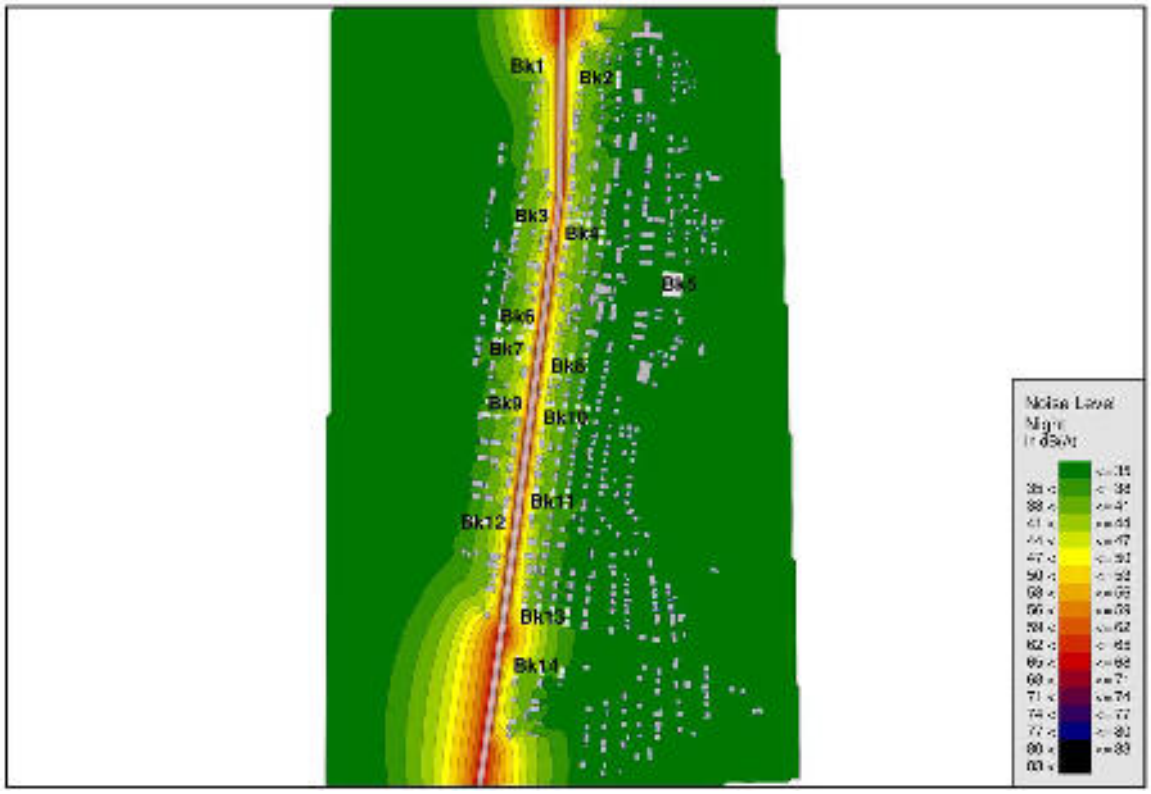


Figure 49: Bestamak, 2030, Nightime with Noise Barrier



483. Given that the road in this section is straight and flat and the houses of a similar size and composition (mostly single storey) 14 'receptors' were selected for detailed analysis as they were considered representative of the residential properties in this section. The following table provides the results of the modeling at the facades of these 14 receptors.

Table 41: Modeling Results, Bestamak Receptors

	2020				2030				2040			
	Without Barrier		**With Barrier (3m)**		**Without Barrier**		**With Barrier (3m)**		**Without Barrier**		**With Barrier (3m)**	
Receptor	**Day**	**Night**	**Day**	**Night**	**Day**	**Night**	**Day**	**Night**	**Day**	**Night**	**Day**	**Night**
Bk1	**59**	**51**	**51**	**43**	**61**	**53**	**53**	**45**	**63**	**55**	**55**	**47**
Bk2	**58**	**50**	**49**	**41**	**60**	**52**	**51**	**43**	**62**	**54**	**53**	**45**
Bk3	**66**	**58**	**52**	**44**	**68**	**60**	**54**	**46**	**70**	**62**	**57**	**49**
Bk4	**64**	**56**	**52**	**44**	**66**	**58**	**54**	**46**	**68**	**60**	**56**	**48**
Bk5	**35**	**27**	**34**	**26**	**38**	**29**	**36**	**27.9**	**40**	**32**	**38**	**30**
Bk6	**67**	**59**	**53**	**45**	**69**	**61**	**55**	**47**	**71**	**63**	**58**	**50**
Bk7	**57**	**49**	**47**	**39**	**59**	**51**	**49**	**41**	**61**	**53**	**51**	**43**
Bk8	**61**	**53**	**50**	**42**	**63**	**55**	**52**	**44**	**65**	**57**	**54**	**46**
Bk9	**64**	**56**	**52**	**44**	**67**	**58**	**54**	**46**	**69**	**61**	**57**	**48**
Bk10	**62**	**54**	**51**	**43**	**64**	**56**	**53**	**45**	**67**	**59**	**55**	**47**
Bk11	**63**	**55**	**51**	**43**	**65**	**57**	**53**	**45**	**67**	**59**	**55**	**47**
Bk12	**64**	**56**	**52**	**44**	**66**	**58**	**54**	**46**	**68**	**60**	**56**	**48**
Bk13	**59**	**51**	**52**	**44**	**61**	**53**	**54**	**46**	**63**	**55**	**56**	**48**
Bk14	**58**	**50**	**51**	**43**	**60**	**52**	**53**	**45**	**63**	**55**	**55**	**47**

484. The results of the model in this section show that the noise barrier is effective at reducing noise levels below IFC guideline limits for daytime and nightime noise in the first year of operation (2020) and that without the barriers noise levels are predicted to be above the limits for all 14 receptors (and consequently all of the front line properties in this area).

485. After ten years (2030) the situation changes slightly. The noise barriers still help keep noise levels below the IFC guideline limits for daytime noise, however several receptors are only slightly above the more stringent nightime limits of 45 dBA.

486. After twenty years the model indicates that some receptors will be within the daytime and nightime limits and others above, a mixed bag of results. In general the nightime limits will be exceeded by 1-3 dBA in the noise barrier scenario.

487. The results for Bestamak show that the noise barrier has a very positive impact on noise reduction decreasing predicted noise levels by as much as 14 dBA in some instances. However, by 2040 the model indicates that the noise barrier may not keep noise levels at the facades of the identified receptors below IFC guideline limits. Obviously this is a very long term scenario and a range of factors may see noise levels reduce over time, e.g. through the introduction of quieter engines, and the evolution of the electric car.

488. Notwithstanding the above mentioned benefits of the noise barriers, the barriers could be considered a impediment to the movement of people across the road as they currently move freely

across the existing road in Bestamak, but also with the risk of accidents. The proposed noise barriers would reduce the existing risk of pedestrian accidents by forcing people to use the proposed pedestrian crossings that will also be installed in Bestamak.

489. The height of the noise barriers means that they could also block light and look unsightly if they are constructed from materials such as wood, brick or concrete.

Pre-construction Noise Management & Mitigation

490. Correct siting of construction camps and ancillary facilities will reduce the potential for elevated noise levels to affect sensitive receptors. Locating these facilities more than 1km downwind from residential or sensitive receptors will eliminate noise impacts to these receptors. Given the fact that large expanses of the Project area are unoccupied this should not be difficult to achieve. In addition, this siting condition is also beneficial for air quality. The proposed camp locations shall be reviewed and approved by KazAvtojol and the Engineer before any ground is broken at the site.

491. Prior to the start of construction, and as part of his SEMP, the Contractor will develop a ***Noise Management Plan*** that will include the mitigation measures outlined below for the construction phase.

Construction Phase Noise Mitigation

492. During the construction phase the Contractor will be responsible for the following:

(i) Time and Activity Constraints. Operations will be scheduled to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the Engineer having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 7 AM during the weekday and at all times during the weekend in the residential areas (Bestamak and KM 0.0 to KM 0.5). When operating close to sensitive areas (within 250 meters) such as medical facilities, the Contractor's hours of working shall be limited to 8 AM to 6 PM.
(ii) Use temporary noise barriers, or noise enclosures, while working in residential areas if measured noise levels exceed 65 dBA during the daytime. Placing the barrier close to the source proves to be effective.
(iii) Prior to the start of works in the residential areas give at least a weeks notice for periods of noisier works. Describe the activities and how long they are expected to take. Keep affected neighbours informed of progress.
(iv) Within normal working hours, where it is reasonable to do so:
    (a) schedule noisy activities for less sensitive times.
    (b) provide periods of respite from noisier works (for example, periodic breaks from jackhammer noise).
(v) All mechanical plant is to be silenced by the best practical means using current technology. Mechanical plant, including noise-suppression devices, should be maintained to the manufacturer's specifications. Internal combustion engines are to be fitted with a suitable muffler in good repair.
(vi) Maintenance tools, machines and equipment so that they are in good conditions. When some wrong is found, they must be fixed immediately in order to reduce noise from the equipment.
(vii) Fit all pneumatic tools with an effective silencer on their air exhaust port.

(viii) Install less noisy movement/reversing warning systems for equipment and vehicles that will operate for extended periods, during sensitive times or in close proximity to sensitive sites. Occupational health and safety requirements for use of warning systems must be followed.
(ix) Turn off plant when not being used.
(x) All vehicular movements to and from the site to only occur during the scheduled normal working hours, unless approval has been granted by the Engineer.
(xi) Keep good conditions of trucks that use to transport construction materials so they cause no loud noise and control the truck speed, to be not exceeded 40 km/hr when driving through communities, and not exceeded 80 km/hr when driving on highways.
(xii) Where possible, no truck associated with the work should be left standing with its engine operating in a street adjacent to a residential area.
(xiii) Provision of noise protection kits such as ear plug, earmuff, for workers who are working in the area with noise level is higher than 85 dB(A). It is designated as a regulation that workers must wear protection kits in case of working in a noisy area.
(xiv) Audible reversing warning systems on mobile plant and vehicles should be of a type which, whilst ensuring that they give proper warning, have a minimum noise impact on persons outside sites. Where practicable, alternative reversing warning systems should be employed to reduce the impact of noise outside sites.

Operational Mitigation

493. It is recommended that the noise barriers proposed by KazAvtojol in Bestamak are implemented as per the detailed design. To limit the aesthetic impact of the barriers and potential blocking of light, it is recommended that the barriers be constructed from a transparent material. The following figures provide examples of transparent noise barriers constructed on highway projects in Macedonia and Sweden.

Figure 50: E-18 Road, Stockholm, Sweden

Figure 51: Corridor X, Macedonia

494. In addition it is recommended that noise barriers are also constructed at KM0.0 to KM0.5 with a similar design to that proposed for Bestamak.

Residual Impact Significance

Construction Phase – ***MINOR***

Despite the fact that comprehensive mitigation measures have been set to manage construction noise there may still be instances where construction works may result in unanticipated elevated noise levels. These will only be temporary and localized. Good oversight from the Contractors HSE team and the Engineers environmental manager along with routine instrumental monitoring should limit the impact of these types of incidents.

Operational Phase – ***LOW / MEDIUM***

Residual impacts will be low up to 2030 if the noise barriers are constructed. However, at 2040 the noise barriers will be less effective and as such noise impacts could be ***LOW/MEDIUM.***

F.10 Cumulative Impacts

495. Cumulative impacts of the Project will be those associated with the portions of the A-27 that are to be constructed by other funding agencies. The main cumulative impacts relate to increased traffic. Traffic levels on the ADB portion of the road will not increase without the completion of the

other road sub-sections some of which are also funded by ADB and the GoK. The main cumulative impacts resulting from the increased traffic will be elevated noise levels during the operational period. Air quality may be compromised slightly in the form of vehicular emissions, but levels of dust will decrease significantly – this will generally lead to improvements in terms of health conditions. Increased traffic in urban area may lead to an increase in accidents between vehicles and pedestrians, however, the safety measures proposed for the project should help to limit such impacts.

F.11 Compliance Impacts

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

(i) Lack of Environmental Clauses in Contracts – The IEE is an environmental statement prepared by the KazAvtojol. While it is prepared by the IEE consultant the IEE defines the commitment by the GoK through the proponent and its contractors and consultants, to implement the mitigation and monitoring actions listed in the IEE. For the measures proposed in the IEE's EMP to be taken seriously, they must become legally binding through inclusion as environmental clauses in the loan agreement between the GoK and ADB as well as the specifications in the contract-bid documents. This will be achieved by integrating the EMP into the contract specifications as a clause and using the EMP to prepare the SEMP defining specific steps to be taken by the contractors and the government during the project construction phase. References to the EMP will be made in the loan agreement between the GoK and ADB. It will be the Engineers responsibility to review the environmental mitigation and monitoring activities undertaken by the Contractor, with payments made only after verification that each work component has been completed as prescribed.
(ii) Lack of Construction Compliance Inspection Services and Environmental Training – While the EMP and the environmental covenants can be very clear and specific, if there is no one knowledgeable to undertake compliance monitoring, inspection and regular reporting, little of the EMP will be implemented or completed. The Engineer, through his National Environmental Specialist (NES) and International Environmental Specialist (IES), will ensure that compliance inspections are undertaken on a regular basis. In addition, the Engineers IES will also provide training to the Contractor and his Environmental Officer in the correct implementation of the SEMPs prior to the commencement of works.
(iii) Lack of Permits / Approvals – The Contractor must obtain a number of permits and licenses in order to comply with national environmental regulations. Any delay in obtaining these approvals could delay the works schedule.

G. Environmental Management Plans and Institutional Requirements

G.1 Introduction

497. The EMP herewith provides the overall Project environmental management framework. It provides summary information of the types of impacts, which are described in detail in **Section F**. It also provides detailed information about the required mitigation and monitoring measures, their implementation arrangements reporting requirements. In addition, the approximate costs of the EMP are outlined.

G.2 Environmental Management Plan

498. Table 41, Table 42 and Table 43 provides the environmental mitigation and observational monitoring for the Project during the pre-construction, construction and operational phases of the Project respectively.

G.3 Instrumental Monitoring Plan

499. Regular monitoring of air quality, water quality and noise levels against Kazakh and IFC standards shall be carried out throughout the construction and commissioning periods. The party responsible for monitoring will be the Engineer who will report the results monthly to KazAvtojol. The reports shall clearly indicate the monitoring dates, times, locations, weather conditions, types of equipment used and calibration information.

500. Table 44 provides the monitoring actions required during the construction phase of the Project.

Table 42: Environmental Management Plan - Detailed Design / Pre-construction Phase

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring
Air Quality	Construction impacts	As part of the SEMP preparation of: • ***Air Quality Plan*** which shall include the items specified under **Section F.6.1** of this IEE. • ***Emergency Response Plan*** to manage any accidental releases of toxic air pollutants. • ***Traffic Management Plan*** including specified haul routes to minimize impacts on sensitive receptors. • ***Health and Safety Plan*** including specific measures relating to dust protection for workers health.	Contractor to prepare Plans	Engineer to review and approve Plans.
	Air quality impacts from stationary sources	• Locations for concrete Batching Plants, Asphalt Plants and Borrow Pits require approval from the Engineer. • All of the above facilities will also require the appropriate GoK permits and licenses. • No batching plant, asphalt plant or borrow pit shall be located within 1km of any residential area or sensitive receptor.	Contractor to select sites.	Engineer and KazAvtojol to approve sites.
Climate Change	Increased temperature / extreme precipitation	As part of the detailed design ensure that all items listed under mitigation, ***Section F.6.2 – Climate Change*** of this IEE are considered by the design team.	Detailed Designers	Engineer to review design documents prior to the start of construction.
Soils	Construction impacts	As part of the SEMP preparation of: • ***Spill Management Plan*** to manage any accidental releases of hazardous liquids. • ***Construction Camp Site and Management Plan*** *to outline how hazardous materials and liquids will be stored and managed.*	Contractor to prepare Plans	Engineer to review and approve Plans.
	Loss of Agricultural Soils	Before the commencement of the construction works of the Project at any road, KazAvtojol must prepare the ***Land Acquisition and Resettlement Plan*** (the LARP), obtain the approval of ADB and then implement the plan and acquire the land.	• KazAvtojol to prepare the LARP. • KazAvtojol to implement the Plan.	ADB to approve the LARP.
Hydrology	Bridge Construction	Preparation of a ***Bridge Construction Plan*** prior to the starting of works at any bridge construction site. The Plan shall include items relating to the construction schedule, construction techniques, work areas, equipment use, siting of hazardous liquids and waste materials, provision of coffer dams, fish spawning periods, procedures for fueling of vehicles, sediment management,	Contractor to prepare the Plans.	Engineer to review and approve plans.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring
		methods to reduce turbidity, OHS measures, etc. The Plan shall also contain a specific Spill Response Procedure relating to the management and clear up of spills in these areas. Preparation of a Construction Camp Site and Management Plan which will include sections on the disposal of liquid waste from the site and all other measures listed under ***Section F.6.4*** – ***Hydrology***, of this IEE.		
		• All new bridges shall be designed for the life expectancy of 100 years. • A design discharge of 100 years return period is considered for bridges. • Bridge designs will ensure that drainage from bridge decks over 50 meters does not discharge directly to the watercourses beneath the bridges. • For bridges over 50m run-off waters shall lead to an interceptor tank, or filter pond adjacent to the bridge in order to trap oil and grease run-off and prevent pollution of surface water courses. • The bridges shall be designed with dry paths under the bridge on either side of the streams to facilitate movements of people, livestock and wildlife. • The bridge design and layout must be aesthetically pleasing and in harmony with the existing environment.	Detailed Designers	Engineer to review design documents prior to the start of construction.
	Culverts	A design discharge of 50 years return period is considered for culverts.	Detailed Designers	Engineer to review design documents prior to the start of construction.
	Siting of facilities	No construction camp, permanent or temporary, shall be located within 500 meters of any river, irrigation channel (not including drainage channels) or reservoir including the Ilek river.	Contractor to select sites.	Engineer and KazAvtojol to approve sites.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring
Flora and Fauna	Impacts to Fish	Preparation of a ***Carp Management Plan*** to restock Ilek river.	• Contractor to hire fish specialist • Fish specialist to complete the plan	Engineer to review and approved the plan.
Land Use	Loss of land and Property	Before the commencement of the construction works of the Project at any road, the KazAvtojol must prepare the ***Land Acquisition and Resettlement Plan*** (the LARP), obtain the approval of ADB and then implement the plan and acquire the land.	• KazAvtojol to prepare the LARP. • KazAvtojol to implement the Plan.	ADB to approve the LARP.
Transportation and Utilities	Traffic management	Preparation of a ***Traffic Management Plan*** as part of the SEMP.	Contractor to prepare plan.	Engineer to review and approve plan.
	Damage to roads	Prior to the commencement of works a ***Road Condition Survey*** will be undertaken as part of the ***Traffic Management Plan*** to record the condition of access roads to asphalt plants, camps, etc.	• Engineer to complete road condition survey. • Contractor to review and agree to the findings of the road condition survey.	N/A
Construction Camps	Selection of Construction Camp Site	• Screening of camp site location to determine significant environmental and social impacts during site selection. • Preparation of a ***Construction Camp Site and Management Plan***. The Plan shall include at a minimum all of the items listed under **Section F.8.4 – Construction Camps**, of this IEE. • Preparation of a ***Spills Response Plan***. • Construction camps shall not be located within one kilometer of an urban area and at least 50 meters from any surface water course. • Coordinate all construction camp activities with neighboring land uses.	Contractor to screen site and provide screening report to the Engineer and KazAvtojol.	• Engineer and KazAvtojol to approve camp locations. • Engineer to review & approve Plans.
Community Health and Safety	Safety of local residents	Prior to the start of works in residential areas stakeholders shall be informed, through public meetings, of the Project schedule and the potential impacts, including noise.	Contractor to facilitate the meetings, record the findings and report them to KazAvtojol and the Engineer.	Engineer to attend meetings

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring
Occupational Health and Safety	Worker Health and Safety	• Prepare an ***Occupational Health and Safety Plan*** (OHS Plan), including the items specified by **Section F.9.3** of this IEE. • Ensure that sub-contractors are provided with copies of the SEMP and its OHS plan and that they adhere to the content of the OHS plan, including the requirements for the application of PPE.	• Contractor to prepare OHS Plan. • Contractor to provide copies of the SEMP and its OHS Plan to sub-contractors prior to their access to the site.	Engineer to review and approve OHS Plan.
	Traffic Safety	Submit a ***Traffic Management Plan*** to local traffic authorities prior to mobilization.	Contractor to prepare TMP.	Engineer to approve TMP.
Emergency Response	Fires, explosions, earthquake, etc.	Preparation of an ***Emergency Response Plan*** (ERP).	Contractor to prepare ERP.	Engineer to review and approve ERP.
Waste Management	Management of waste materials	Preparation of a ***Waste Management Plan***, including measures to re-use and recycle wastes and measures to dispose of hazardous waste.	Contractor to prepare Plan.	Engineer to review and approve Plan.
PCR	Chance Finds	The Contractor shall prepare a ***Chance Find Procedure*** in line with the requirements of the GoK. **Appendix H** provides a sample procedure.	Contractor to prepare Procedure.	Engineer to review and approve Plans.
Vibration	Construction vibration	The Contractor will develop ***Construction Vibration Management Plan*** (CVMP) in line with the requirements specified in **Section F.9.6 – Vibration**, of this IEE.	• Contractor to prepare Plan.	Engineer to review and approve Plan.
Noise	Noise barrier aesthetics	Noise barriers should be constructed from a transparent material similar to those shown in **Figure 24** and Fig**ure 25** of this IEE.		
	Noise at KM0.0 – KM 0.5	Prepare a design for noise barriers at this location (based on that used for Bestamak).	Detailed designers	Engineer to review designs
SEMP Requirement	Preparation of SEMP	Prepare SEMP.	Contractor to prepare SEMP.	Engineer to review and approve SEMP.
	Incorporation of Items into Bid Documents	A specific environmental and social section shall be included within the main Bid Documents indicating that the Contractor shall be responsible for conforming with the requirements of this EMP.	KazAvtojol to ensure EMP is included within Bid Documents.	N/A

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring
Project Awareness	GRM	Prior to start of site works, the Contractor shall: • Communicate the GRM to communities in the project impact zone. • Set-up and publicize a 24-hour hotline for complaints. • Ensure that names and contact numbers of representatives of GRC and the Contractor are placed on the notice boards outside the construction site.	Contractor	N/A

Table 43: Environmental Management Plan - Construction Phase

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
Air Quality	Open burning of waste materials	No burning of debris or other materials will occur at any camp or construction site.	Contractor to implement mitigation.	Engineers NES	Daily site inspections, throughout construction period.
	Dust from Alga Chemical Plant	All workers at work sites within 1km of the Alga chemical plant are given face masks to limit the amount of dust inhaled during the excavation of the pavement in this area.	Contractor to implement mitigation.	Engineers NES	Daily site inspections, throughout construction period.
	Rock-crushing plant	• Rock crushing plant equipment shall be fitted with water sprinklers that will run continuously during dry periods while the plant is operational. • If the sprinklers stop working, the plant shall also cease operation until the sprinklers are functioning. • Water run-off from the sprinkler system shall not discharge directly to surface water courses without first passing through a silt trap or any other suitable device to prevent siltation of surface waters.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.	Engineers NES	Daily site inspections, throughout construction period.
	Exhaust emissions from the operation of construction machinery	• No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the Engineer. • Construction equipment will be maintained to a good standard and fitted with pollution control devices regularly monitored by the Contractor and Engineer.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.	Engineers NES	Daily site inspections, throughout construction period.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
	Emissions from Construction vehicles.	• Emissions from on-road and off-road vehicles should comply with national or regional programs. In the absence of these, the following should be considered: • Regardless of the size or type of vehicle, owners / operators should implement the manufacturer recommended engine maintenance programs. • Drivers should be instructed on a routine basis by the Contractors EM on the benefits of driving practices that reduced both the risk of accidents and fuel consumption, including measured acceleration and driving within safe speed limits. • Implement a regular vehicle maintenance and repair program.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities including vehicle maintenance records.	Engineers NES	• Daily site inspections, throughout construction period. • Annual inspection of vehicle maintenance records.
	Contaminated Dust	• Watering of work sites around Alga (location of existing road rehabilitation within 2km of Alga Chemical plant) once every two hours to limit fugitive dust emissions in this area	• Contractor to implement mitigation. • Engineer to monitor activities.	Engineers NES	• Daily site inspections, throughout construction period.
	Fugitive emissions.	• Conveyor belts (e.g. at batching plants and rock crushing plants) shall be fitted with wind-boards, and conveyor transfer points and hopper discharge areas shall be enclosed to minimize dust emission. • All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins. • Carry out watering for dust control at least 3 times a day: in the morning, at noon, and in the afternoon during dry weather with temperatures of over 25C, or in windy weather. Avoid overwatering as this may make the surrounding muddy. • Earthwork operation to be suspended when the wind speed exceeds 20 km/h in areas within 500 m of any community.	• Contractor to implement mitigation. • Engineer to routinely monitor Contractors activities.	Engineers NES	Daily site inspections, throughout construction period.
Soils Erosion and Soil Contamination	Contamination of Soils	• All fuel and chemical storage will be sited on an impervious base within a bund and secured by fencing. • The storage area will be located away from any watercourse or wetlands. • The base and bund walls will be impermeable and of sufficient capacity to contain 110% of the volume of tank (or one tank if more than one tank is located in the bund). • The construction camp maintenance yard will be constructed on impervious hardstanding with adequate drainage to collect spills (including oil interceptor tanks),	• Contractor to implement mitigation. • Engineer to review and approve bunding prior to the start of construction. • Engineer to review and approve	Engineers NES	Daily site inspections, throughout construction period.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
		there will be no vehicle maintenance activities on open ground. • Filling and refueling will be strictly controlled and subject to formal procedures. • Drip pans will be placed under all filling and fueling areas. Waste oils will be stored and disposed of by a licensed contractor. • All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use. • The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any soils. • Areas using bitumen will be constructed on impervious hardstanding to prevent seepage of oils into the soils. • No bitumen drums or containers, full or used, will be stored on open ground. They will only be stored on impervious hard standing.	vehicle fueling area prior to the start of construction.		
	Loss of topsoil	• Locate topsoil stockpiles outside drainage lines and protect stockpiles from erosion. • Construct diversion channels and silt fences around the topsoil stockpiles to prevent erosion and loss of topsoil. • Rip ground surface prior to the spreading of topsoil. • Remove unwanted materials from topsoil such as roots of trees, rubble and waste etc. • Specifically regarding soil compaction, the Contractor will confine operation of heavy equipment within the RoW, as much as possible, to avoid soil compaction and damage to privately owned land. • If in case private lands are disturbed, the contractor should promptly inform the owner and agree on the ways to remedy the situation.	Contractor to implement mitigation.	Engineers NES	Daily site inspections, throughout construction period.
	Existing Licensed Borrow Pits	For existing borrow pits a due diligence review will be carried out by the Engineer to confirm that those sites identified for use by the Contractor are indeed operating or operable in an appropriate manner. This will include review of the borrow pits operational license. The license should clearly show the validity of the operational period of the borrow pit. A copy of the agreement between the operator and the Contractor should also be provided to the Engineer.	Engineer to undertake due diligence review of existing borrow pits.	N/A	N/A
	New Borrow Pits	Any new borrow pit they will require approval from a range of local government institutions including an inter-regional	• Contractor to get approvals from	Engineers NES	Engineer to review all

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
		committee of the Oblast. An OVOS will need to be prepared by consultants for the owner/operator (the Contractor). In addition, for any new borrow pit to be operated by the Contractor, the Contractor will be responsible for the preparation of a Borrow Pit Action Plan (BAP). The BAP will be submitted to the Engineer prior to the start of construction. The plan will identify the locations of all proposed borrow pits which will also be approved by both the Engineer and representatives of the TEPOs. The plan shall ensure that: – Pit restoration will follow the completion of works in full compliance all applicable standards and specifications. – Arrangements for opening and using material borrow pits will contain enforceable provisions. – The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Engineer will be required before final acceptance and payment under the terms of contracts. – Additional borrow pits will not be opened without the restoration of those areas no longer in use.	local agencies and provide copies to the Engineer. • Contractor to prepare BAP		approvals and plans.
	Soil Erosion	• Material that is less susceptible to erosion will be selected for placement around bridges and culverts. • Re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local flora; (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth. • The Engineer and the Contractor will both be responsible for ensuring that embankments are monitored continuously during construction for signs of erosion.	Contractor to implement mitigation.	Engineers NES	Daily site inspections, throughout construction period.
Hydrology	Ground and surface water pollution.	• Implementation of the specific mitigation measures outlined under **Construction Camps**, below and **Soil Contamination** above. • Provide portable toilet facilities for workers at road work sites.	Contractor to implement mitigation.	Engineers NES	Daily site inspections, throughout construction period.
	Bridges	In the first instance the Contractor will schedule all bridge works during periods of lowest flow. In addition, the Contractor will: • Provide spill kits in worksites around rivers. • Ensure no vehicle refueling occurs within 50 meters of any surface water course. • Divert the water flow near the bridge piers.	Contractor to consult with MoEPA and provide copies of letters confirming construction periods to the Engineer.	Engineers NES	Routine monitoring of bridge works to ensure they are in compliance with MoEPA guidelines.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
		• Provide coffer dams, silt fences, sediment barriers or other devices to prevent migration of silt during construction within streams. • Perform dewatering and cleaning of cofferdams to prevent siltation by pumping from cofferdams to a settling basin or a containment unit. • Carry out bridge construction works without interrupting the traffic on the existing road with the provision of suitable diversions. • Ensure no waste materials are dumped in the river, including re-enforced concrete debris. • Place generators more than 20 meters from the river. • Ensure that no concrete waste from concrete mixers is dumped in the river. • Provide areas where concrete mixers can wash out leftover concrete without polluting the environment. This may be in the form of a lined settling pond at each bridge site. Drivers will be informed of these locations and the requirements to use these settling ponds on a routine basis by the Engineer. Dried waste from the settling ponds can be used as backfill for culverts, etc. • Carefully collect all polystyrene (from expansion joints) so that it does not litter the local environment. • Ensure that no hazardous liquids are placed within 10 meters of the river. • Provide portable toilets at bridge construction sites to prevent defecation by workers into the river. • Ensure that workers are provided with correct PPE including harnesses. • During piling works ensure that pumped water is filtered through a silt trap before being discharged to the river.			
	Drainage and Flooding	• During the construction phase the Contractor will be required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage to properties and land by flooding and silt washed down from the works. • Arrange with the village representatives those works which might interfere with the flow of irrigation waters to be carried out at such times as will cause the least disturbance to irrigation operations.	Contractor to implement mitigation.	Engineers NES	Monitor drainage channels on a weekly basis.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
		• Should any operation being performed by the Contractor interrupt existing irrigation facilities, the Contractors will restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption. • The Contractor will also be responsible for ensuring that no construction materials or construction waste block existing drainage channels within the Project corridor.			
	Water Supply & Discharge	• Only legally permitted water resources shall be used for technical water supply, including rivers. All permits and licenses for water supply and discharge will be obtained prior to use. • Extraction of water for uses as technical water from the Ilek river will be prohibited during low flow periods, as determined by the Engineer and in line with permits.	• Contractor to implement mitigation. • Engineer to review all water extraction / discharge permits.	Engineers NES	• Weekly inspections, throughout construction period. • Annual review of permits.
Biodiversity	Impacts to Fish	• Implement the ***Carp Management Plan***, including the restocking of fish. • Contractors staff will be prohibited from fishing in the Ilek river.	Contractor to implement mitigation.	Engineers NES	• Weekly inspections, throughout construction period.
	Pesticides / Herbicides	No pesticides or herbicides shall be allowed during site clearance works.	Contractor to implement mitigation.	Engineers NES	• Weekly inspections, throughout construction period.
Waste Management and Spoil	Recycling and re-use	• Where possible, surplus materials will be reused or recycled. • Used oil and grease shall be removed from site and sold to an approved used oil recycling company.	Contractor to implement mitigation.	Engineers NES	Monthly review of waste manifests to determine if wastes are being recycled.
	Inert Solid & Liquid waste	• Provide refuse containers at each worksite. • Maintain all construction sites in a cleaner, tidy and safe condition. • Waste storage containers shall be covered, tip-proof, weatherproof and scavenger proof. • Train and instruct all personnel in waste management practices and procedures.	• Contractor to implement mitigation and conduct training. • Engineer to approve any waste disposal site.	Engineers NES	Daily site inspections, throughout construction period. Regular review of Contractors training sessions.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
		• Collect and transport non-hazardous wastes to all approved disposal sites. • Keep copies of waste manifests on site. • Keep a record of waste on-site and waste removed.			
	Asphalt and Concrete	• Waste asphalt will be recycled where possible for base material and shoulder material. • Unused or rejected tar or bituminous products shall be returned to the supplier's production plant. • Waste concrete shall be crushed and re-used as fill material, or base material where possible. • Under no circumstances should concrete mixers be washed out onto open ground at construction sites, such as bridges.	• Contractor to implement any recommendations for re-use of asphalt. • Contractor to implement mitigation.	Engineers NES	Daily site inspections, throughout construction period.
	Hazardous Waste	• Storage of hazardous waste shall be in specific secure locations as identified by the waste management plan. • Hazardous liquids must be stored within impermeable bunds (the bund should be able to contain at least 110% of the volume of the largest storage tank within the bund). • Collect and temporarily store used hazardous waste separately in specialized containers and place in safe and fire-free areas with impermeable floors roofs, at a safe distance from fire sources and according to the requirements of their MSDS. • Training and suitable PPE will be provided to all personnel handling hazardous waste. • Disposal of waste materials shall be undertaken by a licensed waste management company. Keep copies of the companies licenses on record as well as the agreements with the company. • Keep records of the types and volumes of waste removed from the site on a weekly basis. • Keep copies of waste manifests.	• Contractor to implement mitigation. • Engineer to approve any waste disposal site. • Engineer to review waste manifests.	Engineers NES	Daily site inspections, throughout construction period. Monthly review of waste manifests.
Transport and Utilities	Transportation	The Contractor will: • Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions at least 24 hours before the disruptions; • Allow for adequate traffic flow around construction areas via diversions or temporary access roads; • If temporary access roads are to be constructed with a gravel surface they shall be routinely watered by the Contractor during dry weather to reduce dust impacts; and	Contractor to implement mitigation.	Engineers NES	Weekly inspections, throughout construction period.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
		• Provide adequate traffic signs, appropriate lighting, well-designed traffic safety signs, barriers and flag persons for traffic control. • Access roads for batching plants, etc, will be maintained during the construction phase and rehabilitated at the end of construction. • Prohibit the use of the diversion road close to the school in Bestamak.			
	Utilities	• All utilities in the Project area shall be kept operational, particularly during the winter months. • The Contractor will be responsible for liaising with the relevant utilities operators to ensure all utilities remain operational. • Should utilities need relocating in a different location the Contractor will consult with the relevant utilities and local community to ensure that there is no change in supply as a result of these changes.	Contractor to implement mitigation.	Engineers NES	Weekly inspections, throughout construction period.
Asphalt Plants	Emissions & Noise	• Asphalt plants will be located downwind of residential areas and not within one kilometer of any residential area. • Adequate PPE will be provided to staff working in areas of high noise and emissions. • Storage and Use of Hazardous Materials (including bitumen): • Ensure all hazardous materials are stored (including within suitable sized bunds for liquids), handled and disposed of according to their Material Safety Data Sheet (MSDS). • Copies of MSDS will be kept on site with all hazardous materials. • The Contractor will keep a log of the type and volume of all hazardous wastes on site. • The Contractor will keep a plan of site indicating where all hazardous materials are stored.	Contractor to implement mitigation.	Engineers NES	Daily site inspections, throughout construction period. Monthly review of hazardous waste log.
	Vehicle Movement	The Contractor will include the asphalt plant in his ***Traffic Management Plan***, including haul routes from the plant.	Contractor to implement mitigation.	Engineers NES	Daily site inspections, throughout construction period.
	Health and Safety	• To prevent bitumen burns it will be compulsory for the workers handling hot bitumen to wear full-body protection. • All transportation, handling and storage of bitumen will be handled safely by experienced personnel.	Contractor to implement mitigation.	Engineers NES	Daily site inspections, throughout construction period.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
		• The dust from the manufacturing process may pose respiratory hazards, hence protective air mask will be provided to the operators for the loading and unloading of aggregates. • Ear-muffs will be provided those working on the plant. • First Aid kit will be available on site for the workers in case of emergency. • The Material and Data Sheet (MSDS) for each chemical product will be made accessible onsite and displayed.			
Construction Camps	Pollution and Emissions	• The Contractor will ensure that all of the following conditions are met: • Rain-water run-off arising on the site will be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance. The drainage system will be fitted with oil and grease interceptors. • There will be no direct discharge of sanitary or wash water to surface water. • In the absence of functioning sewerage and sewage treatment facilities it is recommended that the Contractor provides his own on-site wastewater treatment facilities. For sites servicing a small number of employees (less than 150), septic tanks may be used. For larger sites, liquid wastes will as a minimum receive primary treatment in anaerobic tank or pond preceded by a bar screen to remove large solid objects (e.g. sticks, rags). • There will be no direct discharge of untreated sanitary or oily wastewater to surface water bodies. • Licensed contractors will be required to collect and disposal of liquid waste from the septic tanks on regular basis. • Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies will be prohibited. • Liquid material storage containment areas will not drain directly to surface water. • Waste water from vehicle washing bays will be free of pollutants if the wash bay has been constructed correctly. • Lubricating and fuel oil spills will be cleaned up immediately and spill cleanup materials will be maintained at the storage area. • Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters and are	Contractor to implement mitigation.	Engineers NES	Daily site inspections, throughout construction period.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
		connected to septic tanks, or waste water treatment facilities. • Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge. • Washing out concrete trucks at construction sites will be prohibited unless specific concrete washout areas are provided for this purpose at the construction site (e.g. a bridge site). The washouts will be impermeable and emptied when 75% full. • Spill cleanup equipment will be maintained on site (including at the site maintenance yard and vehicle fueling areas). The following conditions to avoid adverse impacts due to improper fuel and chemical storage: • Fueling operations will occur only within containment areas. • All fuel and chemical storage (if any) will be sited on an impervious base within a bund and secured by fencing. The storage area will be located away from any watercourse or wetlands. The base and bund walls will be impermeable and of sufficient capacity to contain 110% of the volume of tanks. • Filling and refueling will be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids. • All valves and trigger guns will be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use. • The contents of any tank or drum will be clearly marked. Measures will be taken to ensure that no contaminated discharges enter any drain or watercourses. • Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited. • Should any accidental spills occur immediate cleanup will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized to dispose of hazardous waste. • If determined warranted by the Engineer, the Contractor will provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites.			

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
		• If so requested, the Contractor will ensure that all vehicles are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. • The Contractor will provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site. • The Contractor will be responsible to maintain and cleanup campsites and respect the rights of local landowners.			
Concrete Batching Plants	Pollution and Emissions from Concrete Batching Plants	• To limit impacts from dust, the following conditions will apply: – Batching plants will be located downwind of residential areas and not within one kilometer of any residential area. – The entire batching area traversed by vehicles – including driveways leading into and out of the area – will be paved with a hard, impervious material. – Sand and aggregates will be delivered in a dampened state, using covered trucks. If the materials have dried out during transit they will be re-wetted before being dumped into the storage bunker. – Sand and aggregates will be stored in a hopper or bunker which shields the materials from winds. The bunker should enclose the stockpile on three sides. The walls should extend one metre above the height of the maximum quantity of raw material kept on site, and extend two metres beyond the front of the stockpile. – The hopper or bunker will be fitted with water sprays which keep the stored material damp at all times. Monitor the water content of the stockpile to ensure it is maintained in a damp condition. – Overhead storage bins will be totally enclosed. The swivel chute area and transfer point from the conveyor will also be enclosed. – Rubber curtain seals may be needed to protect the opening of the overhead bin from winds. – Conveyor belts which are exposed to the wind and used for raw material transfer will be effectively enclosed, to ensure dust is not blown off the conveyor during transit. Conveyor transfer points and hopper discharge areas will be fully enclosed.	Contractor to implement mitigation.	Engineers NES	Daily site inspections, throughout construction period.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
		– Conveyor belts will be fitted with belt cleaners on the return side of the belt. – Weigh hoppers at front end loader plants will be roofed and have weigh hoppers shrouded on three sides, to protect the contents from the wind. The raw materials transferred by the front end loader should be damp, as they are taken from a dampened stockpile. – Store cement in sealed, dust-tight storage silos. All hatches, inspection points and duct work will be dust-tight. – Silos will be equipped with a high-level sensor alarm and an automatic delivery shut-down switch to prevent overfilling. – Cement dust emissions from the silo during filling operations must be minimised. The minimum acceptable performance is obtained using a fabric filter dust collector. – Totally enclose the cement weigh hopper, to ensure that dust cannot escape to the atmosphere. – An inspection of all dust control components will be performed routinely – for example, at least weekly. • All contaminated storm water and process wastewater will be collected and retained on site. • All sources of wastewater will be paved and bunded. The specific areas that will be paved and bunded include; the agitator washout area, the truck washing area, the concrete batching area, and any other area that may generate storm water contaminated with cement dust or residues. • Contaminated storm water and process wastewater will be captured and recycled by a system with the following specifications: – The system's storage capacity must be sufficient to store the runoff from the bunded areas generated by 20 mm of rain. – Water captured by the bunds will be diverted to a collection pit and then pumped to a storage tank for recycling. – An outlet (overflow drain) in the bund, one metre upstream of the collection pit, will divert excess rainwater from the bunded area when the pit fills			

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
		due to heavy rain (more than 20 mm of rain over 24 hours). – Collection pits should contain a sloping sludge interceptor, to separate water and sediments. The sloping surface enables easy removal of sludge and sediments. – Wastewater will be pumped from the collection pit to a recycling tank. The pit will have a primary pump triggered by a float switch and a backup pump which automatically activates if the primary fails. – Wastewater stored in the recycling tank needs to be reused at the earliest possible opportunity.			
Community Health and Safety	HIV / AIDS	• Subcontract with an Approved Service Provider to provide an HIV Awareness Program to the Contractor's Personnel and the Local Community. • Repeat the HIV Awareness Program at intervals not exceeding four months	• Contractor to implement mitigation. • Service Provider to implement training. • Engineer to review program.	Engineers NES	Annual review of awareness program activities.
	Code of Conduct	The Contractor shall develop an induction program, including a Code of Conduct, for all workers directly related to the Project. A copy of the Code of Conduct is to be presented to all workers and signed by each worker.	Contractor to implement mitigation.	Engineers NES	Routine assessment of workers staff to determine if the code of conduct has been presented.
	Monthly Meetings	The Contractor will be responsible for holding monthly community meetings within the Project area throughout the construction period.	Contractor to implement mitigation.	Engineers NES	Engineers NES to attend all community meetings.
Occupational Health and Safety	Worker Health & safety	• Initial Safety Induction Course: All workmen will be required to attend a safety induction course before they are allowed access to the Site. • Develop a Safety Training Program including training to recognize and respond to workplace chemical hazards. • Keep a log of both training records and safety incidents including near misses. • Safety Meetings conducted on a monthly basis. • Regularly inspect, test and maintain all safety equipment. • Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately.	• Contractor to implement mitigation. • Engineer to review and approve training program.	Engineers NES	Daily site inspections, throughout construction period. Periodic attendance of training sessions to determine quality and numbers in attendance.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
		• All construction plant and equipment used on or around the Site shall be fitted with appropriate safety devices. • A fully equipped first aid base shall be provided at the Construction Camp and Asphalt Plant. • Coordinate with local public health officials and shall reach a documented understanding with regard to the use of hospitals and other community facilities. • Workers will be provided (before they commence works) with of appropriate PPE suitable for electrical work such as safety boots, helmets, gloves, protective clothes, goggles, and ear protection at no cost to the workers. • Provide portable toilet facilities for workers at road work sites. • Provide fencing on all areas of excavation greater than 2 m deep. Install warning signs.			
	Contaminated Dust	Specific PPE measures shall be provided for workers rehabilitating the existing road around Alga, they include: • Half mask respirators. • Safety goggles (completely enclosed to prevent dust within the goggles). • One time disposable overalls.	Contractor to implement mitigation.	Engineers NES	Daily site inspections and monitoring
	Sub-contractor H&S	• All sub-contractors will be supplied with copies of the SEMP. • Provisions to be incorporated into all sub-contracts to ensure the compliance with the SEMP. All sub-contractors will be required to appoint a safety representative who shall be available on the Site.	• Contractor to provide SEMP. • Sub-contractors to ensure compliance with SEMP	Engineers NES	Routinely monitor sub-contractors activities.
	Noise	Zones with noise level above 80 dBA must be marked with safety signs and appropriate PPE must be worn by workers.	Contractor to implement mitigation.	Engineers NES	Daily site inspections and monitoring (with smartphone technology) throughout construction period.
PCR	Impacts to Cemeteries	During the construction phase the road side facing portions of the cemeteries shall be fenced off to ensure that there is no encroachment into this area by construction workers or equipment.	Contractor to implement mitigation.	Engineers NES	Weekly site inspections of the fencing.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
	Mosque	During the construction phase works shall be schedule that no works occur within 250 meters of the Mosque in Bestamak on Fridays, or during religious holidays.	Contractor to implement mitigation.	Engineers NES	Weekly site inspections of the fencing.
	Impacts to Historical and archaeological areas	In the event of any chance finds during the construction works procedures shall apply that are governed by GoK legislation and guidelines and as outlined in the Contractors Chance Find Procedure.	Contractor to implement mitigation.	Engineers NES	Daily site inspections throughout construction period.
Noise	Construction noise	• Time and Activity Constraints. Operations will be scheduled to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the Engineer having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 7 AM during the weekday and at all times during the weekend in the residential areas (Bestamak and KM 0.0 to KM 0.5). When operating close to sensitive areas (within 250 meters) such as medical facilities, the Contractor's hours of working shall be limited to 8 AM to 6 PM. • Use temporary noise barriers, or noise enclosures, while working in residential areas if measured noise levels exceed 65 dBA during the daytime. Placing the barrier close to the source proves to be effective. • Prior to the start of works in the residential areas give at least a weeks notice for periods of noisier works. Describe the activities and how long they are expected to take. Keep affected neighbours informed of progress. • Within normal working hours, where it is reasonable to do so: o schedule noisy activities for less sensitive times. o provide periods of respite from noisier works (for example, periodic breaks from jackhammer noise). • All mechanical plant is to be silenced by the best practical means using current technology. Mechanical plant, including noise-suppression devices, should be maintained to the manufacturer's specifications. Internal combustion engines are to be fitted with a suitable muffler in good repair. • Maintenance tools, machines and equipment so that they are in good conditions. When some wrong is found, they must be fixed immediately in order to reduce noise from the equipment.	Contractor to implement mitigation.	Engineers NES	Daily site inspections throughout construction period.

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities	Monitoring	Monitoring Responsibility & Schedule
		• Fit all pneumatic tools with an effective silencer on their air exhaust port. • Install less noisy movement/reversing warning systems for equipment and vehicles that will operate for extended periods, during sensitive times or in close proximity to sensitive sites. Occupational health and safety requirements for use of warning systems must be followed. • Turn off plant when not being used. • All vehicular movements to and from the site to only occur during the scheduled normal working hours, unless approval has been granted by the Engineer. • Keep good conditions of trucks that use to transport construction materials so they cause no loud noise and control the truck speed, to be not exceeded 40 km/hr when driving through communities, and not exceeded 80 km/hr when driving on highways. • Where possible, no truck associated with the work should be left standing with its engine operating in a street adjacent to a residential area. • Provision of noise protection kits such as ear plug, earmuff, for workers who are working in the area with noise level is higher than 85 dB(A). It is designated as a regulation that workers must wear protection kits in case of working in a noisy area. • Audible reversing warning systems on mobile plant and vehicles should be of a type which, whilst ensuring that they give proper warning, have a minimum noise impact on persons outside sites. Where practicable, alternative reversing warning systems should be employed to reduce the impact of noise outside sites.			
	Noise barriers	Construction of the noise barriers specified in the detailed design.	Contractor to implement mitigation.	Engineers NES	Routine inspection of the noise barrier works.
Vibration	Construction Vibration in Bestamak	The Contractor shall follow the procedures outlined in **Section F.9.6** of this IEE.	Contractor and Engineer to implement mitigation.	N/A	N/A

Table 44: Environmental Management Plan – Operational Phase

Subject	Potential Impact / Issue	Mitigation / Monitoring Measure	Responsibilities
Hydrology	Drainage issues	Monitor drainage along the road to ensure that it does result in increased run-off and flooding.	KazAvtojol
Road Maintenance	Pollution of water	• Perform maintenance paving of the road sections and bridge decks only in dry weather to prevent runoff contamination. • Use staging techniques to reduce the spread of paving materials during the repair of potholes and worn pavement. These can include covering storm drain inlets and manholes during paving operations, using erosion and sediment controls to decrease runoff from repair sites, and using drip pans, absorbent materials and other pollution prevention materials to limit leaks of paving materials and fluids from paving machines. • Comply with mitigation measures defined for water protection during construction. • Remove all waste, material, machinery and tool from the area after completion of works. • Reinstate disturbed areas – if the case.	KazAvtojol

Table 45: Pre-Construction / Construction Phase Instrumental Monitoring

Issue	Monitoring	Locations	Schedule	Responsibilities	Reporting
Air Quality	Air quality impacts will be limited to residential areas and construction camps. The main construction related air quality impact will be from dust which can be observed through regular on-site monitoring by the Engineer. Instrumental monitoring of air quality should only be undertaken in the event of a complaint from Project stakeholders, or if specified by the Engineer. The parameters and locations to monitor will depending on the issue, dust (measure PM or TSP), vehicle emission (measure NOx and SOx, etc).	At locations of complaints or at locations specified by the Engineer.	As required.	The Engineer shall hire certified laboratory to perform the monitoring activities.	The certified laboratory shall provide the results to the Engineer within three days of the monitoring activity. The results shall be presented in the Engineers monthly report to KazAvtojol.
Noise	Routine noise monitoring shall undertaken throughout the construction period in the residential areas. Parameters to be monitored include: Laeq 1h (dBA) daytime and nightime.	At work sites in Bestamak and KM0.0 – KM 0.5, or others as required by the Engineer.	Monitoring to be undertaken weekly in these construction areas.	The Engineer shall hire certified laboratory to perform the monitoring activities.	The certified laboratory shall provide the results to the Engineer within three days of the monitoring activity.
Vibration	Vibration sensors for PPV monitoring.	At potentially affected properties in Bestamak as defined in **Appendix K** and also by the Engineer after	Throughout construction phase in Bestamak.	The Engineer shall procure monitoring equipment and undertake the monitoring.	Results will be logged with the Engineer and results will be presented weekly to the Contractor and Monthly to KazAvtojol.

Issue	Monitoring	Locations	Schedule	Responsibilities	Reporting
		review of the CVMP.			
Surface Water Quality	Establish routine water quality monitoring throughout the construction period. The following parameters shall be monitored: pH; dissolved oxygen, Suspended Solids; BOD5, Total Phosphorus, Nitrites, Ammonia, Oil and Grease.	50 meters upstream and 50 meters downstream from Ilek river bridge sites (2 locations).	Monitoring to be undertaken weekly during bridge construction works.	The Engineer shall hire certified laboratory to perform the monitoring activities.	The certified laboratory shall provide the results to the Engineer within seven days of the monitoring activity.

G.4 EMP Costs

501. Most costs associated with the environmental recommendations of the EMP are a normal part of preparing the bid and contract documents and ensuring that proper environmental provisions are incorporated therein. The installation of septic systems at construction camps, for example, is an environmental necessity, but not generally considered an "environmental cost". Table 45 lists the proposed mitigation measures and indicates where they would be "included in the project budget" as part of a bid document and where additional costs are a likely "environmental cost" beyond what would normally be included in a project budget.

Table 46: EMP Costs

Activity	Item	Number of Units / Unit cost /US$	Cost estimate / US$	Responsibility
Pre-construction				
SEMP and its associated plans	SEMP and associated plans	Included in Project Construction costs	-	Contractor
Approval of Camp locations	Approval	Included in Project Construction costs	-	KazAvtojol / Engineer
Incorporation of Environmental Items into Bid Documents	Item in Bid Document	Included in Detailed Design Budget.	-	KazAvtojol
Obtain relevant permits	Permits	Included in Project Construction costs	-	Contractor
Total Pre-construction costs				**$0**
Construction				
Standard site management	Septic Tanks	Included in Project Construction costs	-	Contractor
Additional environmental measures	Spill Kits	20 / US$200	4,000	Contractor
	Bunds for fuel and oil storage	Included in Project Construction costs	-	Contractor
	Waste containers	Included in Project Construction costs	-	Contractor
	Waste Storage areas	Included in Project Construction costs	-	Contractor
	Waste collection and disposal	Included in Project Construction costs	-	Contractor
	Storage areas for hazardous materials	Included in Project Construction costs	-	Contractor
	Sprinklers for rock crushing plant	Included in Project Construction costs	-	Contractor
	Drainage (including oil and grease interceptors)	Included in Project Construction costs	-	Contractor
	Vehicle washing bay	Included in Project Construction costs	-	Contractor
	Fire safety	Included in Project Construction costs	-	Contractor
	PPE	Included in Project Construction costs	-	Contractor

Activity	**Item**	**Number of Units / Unit cost /US$**	**Cost estimate / US$**	**Responsibility**
	Impervious hardstanding (for maintenance yards, bitumen storage, etc)	Included in Project Construction costs	-	Contractor
	First aid facilities	Included in Project Construction costs	-	Contractor
	Animal Crossings	Included in Project Construction costs	-	Contractor
	Fencing around PCR	2 / $500	$1,000	
	Water bowsers	Included in Project Construction costs	-	Contractor
	Water sprinklers (rock crushing plant)	Included in Project Construction costs	-	Contractor
	Dust control measures (rock crushing and batching plants)	Included in Project Construction costs	-	Contractor
	Tarpaulins	Included in Project Construction costs	-	Contractor
Embankment vegetation and soil erosion measures	Vegetation, Labor and maintenance	Included in Project Budget	-	Contractor
Noise	Noise Barriers	Included in Project Budget		Contractor
Training & Awareness Programs	Safety Training	Included in Project Budget	-	Contractor
	HIV/AIDS Training	3 / US$1,000	3,000	Independent Contractor
	Toolbox Training	Included in Project Budget	-	Contractor
	Construction orientation meetings	Included in Project Budget	-	Contractor
	Periodic meetings with stakeholders	Included in Project Budget	-	Contractor
Clean-up of construction sites.	Labor, waste disposal	Included in Project Budget	-	Contractor
Environmental Staff	Contractors EO	33 / US$ 1,500	49,500	Contractor
	Contractors H&S Specialist	33 / US$ 1,500	49,500	Contractor
	Engineers H&S Specialist	33 / US$ 1,500	49,500	Engineer
	Engineers IES	6 / US$ 20,000	120,000	Engineer
	Engineers NES	33 / US$ 1,500	49,500	Engineer
Total Construction Costs				US$ 326,000
Total Cost				**US$ 326,000**

Table 47: Construction Phase Instrumental Monitoring Costs

Activity / Item	Frequency / Responsibility	Unit Cost	Cost /USD
Air Quality Monitoring	TBD / Engineer to hire certified laboratory.	250 per site	Estimated 10,000
Noise Monitoring	Weekly (2 sites) – Construction Phase in residential areas estimated at 3 months each location / Engineer to hire certified laboratory.	250 per site	6,000
Surface Water Quality Monitoring	Weekly during construction period at the 2 Ilek river bridge sites - Construction Phase in each area estimated at 2 months each location / Engineer to hire certified laboratory.	250 per site	12,000
Vibration Monitoring	Throughout construction phase in Bestamak. 10 monitoring units required that can be moved as construction progresses through the town. Engineer to undertake the monitoring exercise.	4,000 per monitoring unit.	40,000
Total			**68,000**

G.5 Specific EMP (SEMP)

502. The SEMP is the documents that the Contractor shall prepare outlining how he intends to implement the EMP and ensure that all of the mitigation and monitoring is completed according to the implementation arrangements specified in this EMP and the IEE as a whole.

503. The SEMP will describe the precise location of the required mitigation / monitoring, the persons responsible for the mitigation / monitoring, the schedule and reporting methodology. The SEMP will also include the following plans:

(iii) Topic Specific Plans:
- (j) Waste Management Plan.
- (k) Traffic Management Plan.
- (l) Occupational Health and Safety Plan.
- (m) Emergency Response Plan.
- (n) Air Quality Plan.
- (o) Spill Response Plan.
- (p) Vibration Monitoring Plan.
- (q) Noise Management Plan.
- (r) Construction Vibration Management Plan

(iv) Site Specific Plans:
- (c) Construction Camp Plan.
- (d) Bridge Construction Plan (for each bridge construction site)

504. The SEMP will be submitted to the Engineer and KazAvtojol for approval at least 30 days before taking possession of any work site. No access to the site will be allowed until the SEMPs are approved by the Engineer and KazAvtojol. New topic specific or site specific EMPs may also need to be developed by the Contractor during the construction phase. These new plans will also need to be approved by the Engineer and the RD.

G.6 Bid Documents

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

G.7 Contract Documents

506. The Contract Documents will follow a broadly similar pattern to the Bid Documents. It is not considered necessary to repeat the mitigation measures verbatim in a list of environmental contract provisions, rather the Contract will specify that the Contractor is responsible for implementation of the EMP via his SEMP. Again, the EMP will be included as an Annex to the Contract so the Contractor will be liable for any non-conformance with the EMP, and thereby this IEE.

G.8 Contractor Requirements

507. As stated above, the Contractor will be responsible for the preparation of the SEMP. The SEMP will need to be fully compliant with the EMP and this IEE as a whole and will need to be prepared within 30 days of Contract award and approved 30 days prior to access to the site.

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

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

- Degree in environmental sciences and related expertise.
- Fluent in Kazakh, Russian and English.
- Experience of at least one construction project of a similar size and scale.

510. The EO will be responsible for the preparation of weekly environmental checklists and an environmental section of the Contractor's monthly progress reports that shall be submitted to the Engineer for review. The Engineer shall provide a template of the checklist to the Contractor.

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

(i) General Progress of the Project.
(ii) Environmental Incidents; e.g. spills of liquids, accidents, etc.
(iii) Progress of any environmental initiatives, e.g. energy savings, recycling, etc.
(iv) Records of any environmental monitoring, both observational and instrumental.
(v) Conclusions and Recommendations.

512. The EO shall provide daily toolbox training at the construction camp and also at construction sites. The EO shall keep a record of all monthly training and toolbox training undertaken. The Contractor shall also hire a qualified Health and Safety Specialists for the Project duration.

G.9 Engineer Requirements

513. As noted in the mitigation plans above, the Engineer is tasked with specific responsibility to review designs and ensure safeguard compliance of civil works – with particular emphasis on the monitoring of implementation of EMP through the Contractors SEMP and related aspects of the project. The Engineer will also be responsible for reviewing and approving the monthly reports prepared by the Contractor, especially the first monthly report, to ensure that it contains all of the required reporting elements, such as instrumental monitoring results. The Engineer will also be responsible for regular review and attendance of the Contractors environmental, health and safety training.

514. The Engineer is also responsible for engaging external services from a certified laboratory for instrumental monitoring of air quality, noise and water during the construction phase.

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

Engineers National Environmental Specialist

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

517. Qualification: Degree in environmental sciences or equivalent. Ten years experience of conducting environmental impact assessments and implementation of environment mitigation plans and/or monitoring implementation of environmental mitigation measures during implementation of road projects projects funded by developing partners, including the ADB.

518. Time Period – The NES shall be employed permanently over the duration of the construction period.

519. The Engineer shall also retain a national health and safety specialist for the duration of the Contract. The specialist will be responsible for the day to day monitoring of health and safety aspects of the Contractors works as well as keeping a log of safety statistics.

Engineers International Environmental Specialist

520. Scope of Services: Prior to the start of the Project the IES will:

- Review the Contractors SEMP with KazAvtojol Safeguards staff to ensure that all relevant aspects of this EIA and its EMP are included before it is approved.
- Prepare a detailed environmental and social action plan for the Engineers monitoring activities. The plan shall include environmental monitoring checklists to be completed by the NES prior to the start of the Project.
- He/she will conduct a series of environmental training sessions with KazAvtojol Safeguards staff (and Project PIU staff) at the start of the Project to provide at a minimum:
    - Environmental awareness on ADB and national environmental safeguards policies.
    - An understanding of the requirements of the EIA.
    - Details of how the EMP should be implemented and monitored.
    - International best practice.

521. During the construction phase the main task of the IES is to undertake monitoring and reporting of Contractor's compliance with contractual environmental mitigation measures. To do this he will:

- Review the NES weekly environmental checklists and monthly reports.
- Undertake quarterly site visits (of two weeks per quarter) to inspect the Contractors works with the NES.
- Provide guidance and assistance to the NES.
- Provide assistance to KazAvtojol Safeguards staff when required.
- Prepare quarterly environmental reports to be submitted to the PIU and ADB.

522. Qualification: Degree or diploma in environmental sciences or equivalent. At least 20 year's experience (15 international) in conducting environmental impact assessments and implementation of environment mitigation plans and/or monitoring implementation of environmental mitigation measures and health and safety plans during supervision of road projects funded by ADB. Project experience in Kazakhstan and KazAvtojol is essential.

523. Time Period: The IES shall be engaged on a part-time basis for a period of six months spread over the duration of the construction period (two months per year, plus a month at the start of the Project to provide training and assistance to KazAvtojol). The specific on-site inputs will be determined by the Engineers Team Leader and KazAvtojol. However time should be allocated to work from home in order to regularly review weekly checklists and monthly reports.

Engineers National Health and Safety Specialist

524. Scope of Services: He/she will (i) review all documents and reports regarding the integration of health and safety issues including contractor's OHS Plan, Traffic Management Plan and Community Health and Safety Plan, (ii) supervise the contractors' compliance to these plans and the SEMP, and (iii) prepare monthly compliance reports including a log of safety statistics.

525. Qualification: Degree or qualification in occupational health and safety or equivalent. Preferably five years' experience in conducting OHS audits and implementation of OHS plans during implementation of projects including highway projects funded by developing partners.

526. Time Period – The specialist shall be employed permanently over the duration of the construction period.

G.10 KazAvtojol PIU Requirements

527. A review of the capacity of KazAvtojol was undertake as part of this IEE. The review indicates that the existing KazAvtojol has the expertise to manage the Contractors environmental performance. However, as noted above, it is recommended that KazAvtojol safeguards staff be part of the training program prepared by the Engineers IES. The training program should last approximately two weeks and will help KazAvtojol staff establish a firm grasp of the potential issues they may face while implementing the Project.

G.11 EMP Implementation Summary

528. The following Table summarizes the various institutional responsibilities for the implementation of the environmental management plan at various stages of the Project Road rehabilitation.

Table 48: EMP Implementation

Project Stage	Responsible Institution	Responsibilities
Detailed Design	KazAvtojol with the Detailed Design Consultant and IEE Team.	• Incorporate EMP mitigation measures into engineering design.
	KazAvtojol	• Ensure EMP is incorporated into the works Contracts.
	KazAvtojol	• Review Contractors proposals to ensure that they are aware of the EMP requirements and that line items for environmental management as per the EMP are included in the BOQ.
Pre-construction	Contractor	• Prepare SEMP
	Contractor	• Identification of construction camp sites. • Approvals / Licenses for construction camp sites.
	Engineer, ADB and PIU	• Review and approve SEMP
	Engineer	• Environmental Training for the PIU
	Contractor and Engineer	• Site Induction

Construction	Contractor (through its EM)	• Daily monitoring of environmental issues • Preparation of weekly environmental checklists • Preparation of Monthly environmental reports • Preparing Corrective action plans
	PIU	• Routine site visits to monitor Contractors performance.
	Engineer	• Weekly monitoring of the Contractors compliance with EMP / SEMP by the NES. • Issuing the Contractor with Non-compliance Notices • Monthly reporting to KazAvtojol of Contractors performance based on the review of Contractors weekly checklists and weekly site visits. • Quarterly Environmental Reports prepared by the IES and submitted to PIU and ADB.

H. Public Consultation, Information Disclosure & Grievance Mechanism

H.1 Public Consultations

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

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

(i) Begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle;

(ii) Provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people;

(iii) Is undertaken in an atmosphere free of intimidation or coercion;

(iv) Is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and

(v) Enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues.

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

530. Public consultations were held during September and December 2015 (in the framework of the national EIA (OVOS) process. The consultations were advertised in local papers two weeks prior to the event (see **Appendix J**). Names of all attendees can be found in **Appendix J**.

531. Further consultations have been undertaken in July, September, October, 2018 in line with ADB requirements outlined above for 'meaningful consultations'. The following section provides an overview of the consultations. Note that these consultations included resettlement aspects and as such this section only focuses on relevant environmental and social questions that were asked during the consultations. For issues relating to resettlement arising from the consultations the reader is referred to the LARP.

H.1.1 Summary of Consultations

Table 49: Aktobe Oblast Public Consultation (September, 2015)

Date: 29 September 2015
Location: Bestamak village, conference hall of the Bestamak rural school, Alga rayon

Panel Members:

- T.I.Isenov, Akim of Bestamak rural okrug/Alga rayon
- K.Z. Dauletalin, Director of Bestamak rural school , Alga rayon
- T. D. Doszhanov: Senior specialist of Akimal of Bestamak rural okrug/Alga rayon.
- R.S. Tazhbanov: Head of department, Aktobe branch of KazAvtojol.
- A.B. Zhumasheva: Head of Department , Aktobe branch of KazAvtojol.
- E.S. Kalaganov: Senior specialist, Aktobe branch of KazAvtojol
- S. M. Urazbekov: Chief Engineer of Ltd "Engineer centre "Astana".
- A.A. Golubnichiy: Director of Ltd. "ProjectStroy Dialog"

List of Participants:
44 Participants

#	Question / Comment	Answer	IEE Reference

1	Mr.A.Kanatbayev, pensioner, resident of Bestamak village. Engineering communications pass along the road, will be they retransferred to other place or reorganized?	The project will provide for reorganization or removal according to the technical specifications of the owners of communications.	Utilities are discussed under ***Item F.8.1 – Transportation Facilities and Utilities*** with mitigation and management measures provided for disruptions to utilities
2	Mr.A.Kanatbayev, pensioner, resident of Bestamak village. Will be the imposition of the road on the red lines of residential buildings?	The project does not affect the red lines of the houses, the minimum width between houses is 40 meters, the width of the road is 26 meters, and an additional width of 3 meters is provided for local residents.	Not required.
3	Ms.B.Kazhirova, pensioner, resident of Bestamak village. How will the issue with air pollution be solved?	The pavement will be done by asphalt and concrete - this will help to solve the pollution issue, also noise protection screens will be installed and they will prevent the rising of the noise and also direct the exhaust gases upwards.	Air quality in the construction and operational phases of the Project is discussed under ***Section F.6.1 – Air Quality***.
6	Mr. A.Akhmetov, chairmen of the Council of Elders. What is the source of funding of road reconstruction?	This project will be implemented through the investments of foreign banks.	Not required.
7	Ms.A.Narguzhina, resident of Bestamak village. Will transit vehicles drive on internal roads?	The movement of freight transit transport is not envisaged on internal roads, therefore the street-road network of the Bestamak village will be affected.	Not required.
8	Mr. A.Akhmetov, chairmen of the Council of Elders. Why bypass road can not be constructed in Bestamak? How the issue of road safety on the streets of the village will be solved?	If to plan the bypass of the village, then all transit vehicles will not enter the village, the income of roadside cafes will decrease. The project will provide the lighting of the main road and; road signs, speed limit signs and artificial preventing structures will be installed on the streets of the village.	The issue of a bypass around Bestamak has not been discussed in this IEE as this option was ruled out for technical and economic reasons.
9	Mr. A.Akhmetov, chairmen of the Council of Elders. How will traffic be organized during the construction?	The parallel streets will be repaired in frame of project, relevant road warning signs will be installed during construction. After completion of construction the roads will be restored and road signs will be installed.	Traffic diversions are discussed as part of ***Section B.6.5 - Diversions***.

Table 50: Aktobe Oblast Public Consultation (December, 2015)

Date: 24 December 2015
Location: Bestamak village, conference hall of the Bestamak rural school, Alga rayon

Panel Members:

1. T.I.Isenov, Akim of Bestamak rural okrug/Alga rayon
2. K.Z. Dauletalin, Director of Bestamak rural school , Alga rayon
3. B.A.Baimagambetov, Director of Aktobe branch of JSC KazAvtojol.

4. E.S. Kalaganov: Senior specialist, Aktobe branch of JSC KazAvtojol
5. S. M. Urazbekov: Chief Engineer of Ltd."Engineer centre "Astana".
6. A.A. Golubnichiy: Director of Ltd "ProjectStroy Dialog" Aktobe"

#	Question / Comment	Answer	IEE Reference
1	How many light crossings are planned, what is their location and what is the distance between them?	Three light crossings are designed in the beginning, middle and end of the Bestamak village. The distance between first and second light will be 650 m, between second and third one – 350 meter.	Discussed as part of ***Section B – Project Description***.
2	What is the height of noise protection screens?	The height of noise barriers will be calculated, but currently the designed height is 3 m.	Noise barriers are discussed as part of ***Section F.9.7 – Noise***.
3	How the passing of cattle will be organized?	Two artificial structures will be arranged for the cattle passing. They will be installed in the beginning and at the end of Bestamak village.	Cattle underpasses are shown in ***Table 5*** under ***Section B.4.5 – Bridges, Overpasses, Underpasses and Crossings***.
4	Mr. S.Urumbaev, owner of "Express" café. My café is located in the first line of construction. Is it possible to construct parking zone near the café?	This question will be considered.	To be addressed as part of the Project LARP.
5	Will be bypass road arranged during the road construction?	The beginning of the temporary bypass road towards the Aktobe-Alga will start from the road section of Republican Importance "Aktobe-Atyrau-the border of the Russian Federation (to Astrakhan)", then it will go along the Eset Batyra street, then turn to the street, located between the Temirzholy street and railways, then to the access with existing road with asphalt-concrete pavement in the area of railway passage, then it will go out to the road of republican importance. The beginning of the temporary bypass towards the Alga-Aktobe will start with existing access (exit) from the road of republican importance towards the memorial complex "Eset Batyra", then exit to Bokenbay Batyra street with turn to the Alga street and entering to the road of republican importance.	Traffic diversions are discussed as part of ***Section B.6.5 - Diversions***.

Table 51: Aktobe Oblast Public Consultations (November, 2018)

Date: 8 November 2018
Location: Aktobe, conference hall of the school N71 of Aktobe city

Panel Members:

- A.I. Kubenov, Head of State Department of natural resources management and regulation", Akimat of Aktobe Oblast
- M.Mahambetov, Director of KazAvtojol of Aktobe oblast
- A.Satylganova: ADB, Social safeguards specialist
- M. Babadzhanova: ADB, Regional environmental safeguards consultant
- Zaruhi Hayrapetyan:.ADB, International social safeguards consultant
- K.Serdaliev.ADB, National social safeguards consultant

Program

1. Provision of information on updated project design approved by state expertise - M.Mahambetov (in Kazakh, power point presentation, map with project design details)
2. Main approaches of ADB Policy statement (2009) on environmental safeguards, content of IEE/EMP and additional environmental impacts surveys of 2018, monitoring program, project institutional responsibilities on EMP implementation – M.Babadzhanova (in Russian, Power Point presentation)
3. Social safeguards and resettlement principles of ADB policies for the Project, Grievance redress mechanism developed for the Project – K.Serdaliev (in Kazakh, power point presentation)

Information brochures were distributed also to participants with information on issues indicated in the program

List of Participants:
30 Participants (See Appendix J)

#	Question / Comment	Answer	IEE Reference
1	Ms.S.Kuanysheva, resident of Aktobe: Will local people be recruited during construction and where do they send their resumes, etc.?	The project provides for employment of the local population during the construction of the highway, local people can send their questions or resume to e-mail addresses or call the telephone numbers indicated in the information brochures provided.	Not required
2	Mr.U.Ibraev, resident of Aktobe city. When the construction of the Aktobe-Kandyagash highway will start?	A tender (bidding process) will be held, and construction is tentatively scheduled to begin in 2019. The construction period according to the project is 36 months.	Not required
3	Mr.A.Kubenov, Head of State Department of natural resources management and regulation": Will Contractors pay for water use and quarries during construction?	According to the national environmental legislation and also the requirements of ADB, Contractors must obtain appropriate permits not only for the use of water resources for technical needs, the use of quarries, but also for emissions into the air and discharges to the water. The Contractor will pay for the use of natural resources and discharges / emissions into the environment, waste disposal, etc.in accordance with existing regulations in the country.	Requirements for permits are discussed throughout the IEE, in particular, ***Section F.8.4 Construction Camps, Asphalt Plants, Batching Plants & Temporary Storage Sites***
4	Wrap up	The participants noted the importance of road reconstruction for the improvement of the population welfare and reliability/safety of the road traffic in the Aktobe region.	Not required



Table 52: Aktobe Oblast Public Consultations (November, 2018)

Date: 8 November 2018
Location: Bestamak, Alga district, conference hall of the House of culture

Panel Members:

1. N.S. Aldiyarov, Akim of Alga district
2. M.Mahambetov, Director of KazAvtojol of Aktobe oblast
3. A.Satylganova: ADB, Social safeguards specialist
4. M. Babadzhanova: ADB, Regional environmental safeguards consultant
5. Zaruhi Hayrapetyan:.ADB, International social safeguards consultant
6. K.Serdaliev.ADB, National social safeguards consultant

Program

1. Provision of information on updated project design approved by state expertise - M.Mahambetov (in Kazakh, power point presentation, map with project design details)
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3. Social safeguards and resettlement principles of ADB policies for the Project, Grievance redress mechanism developed for the Project – K.Serdaliev (in Kazakh, power point presentation)

Information brochures were distributed also to participants with information on issues indicated in the program

List of Participants:
30 Participants (See Appendix J)

#	Question / Comment	Answer	IEE Reference
1	Mr. M.Shyntasov, pensioner, resident of Bestamak village: The population of Alga district. including Bestamak village, fully supports the construction of the Aktobe-Kandyagash road and this road project	Noted with thanks	Not required
2	Mr.T.Almashev, pensioner, resident of Bestamak village: Can a tractor with hay drive to my house?	The project provides for the local access road in Bestamak which will have the width of 4.5 meters and also sidewalk with the width of 1.5 meters	Not required
3	Mr.T.Esbergenov, pensioner, resident of Bestamak: When the construction of the Aktobe-	A tender (bidding process) will be held, and construction is tentatively scheduled to begin in 2019.	Not required

	Kandyagash highway will start?		
7	Wrap up	The participants noted the importance of road reconstruction for the improvement of the population welfare and reliability/safety of the road traffic in the Aktobe region.	Not required






Table 53: Aktobe Oblast Public Consultations (November, 2018)

Date: 9 November 2018
Location: Alga, Alga district, conference hall of the secondary school N2

Panel Members:

1. R.S. Kadyrbergenov, deputy Akim of Alga district
2. M.Mahambetov, Director of KazAvtojol of Aktobe oblast
3. A.Satylganova: ADB, Social safeguards specialist
4. M. Babadzhanova: ADB, Regional environmental safeguards consultant
5. Zaruhi Hayrapetyan:.ADB, International social safeguards consultant
6. K.Serdaliev.ADB, National social safeguards consultant

Program

1. Provision of information on updated project design approved by state expertise - M.Mahambetov (in Kazakh, power point presentation, map with project design details)
2. Main approaches of ADB Policy statement (2009) on environmental safeguards, content of IEE/EMP and additional environmental impacts surveys of 2018, monitoring program, project institutional responsibilities on EMP implementation – M.Babadzhanova (in Russian, Power Point presentation)
3. Social safeguards and resettlement principles of ADB policies for the Project, Grievance redress mechanism developed for the Project – K.Serdaliev (in Kazakh, power point presentation)

Information brochures were distributed also to participants with information on issues indicated in the program

List of Participants:
30 Participants (attached)

#	Question / Comment	Answer	IEE Reference
1	Mr.Zh.Konzharuly, Chairmen of the Coilcil of veterans, resident of Alga: Why the highway does not pass along	The project provides for bypass roads, including Alga and Kandyagash for the purposes of traffic and	Not required.

	the existing highway, in particular, through the city of Alga.?	population safety. The old road will be repaired and then it will be under control of local executive bodies.	
2	Mr.B.Zhumabaev, secretary of Alga district maslihat (coincil), resident of Alga: The population of Alga district fully supports the construction of the Aktobe-Kandyagash road and this road project	Noted with thanks	Not required
3	Mr.Zh.Kashkinbaev, pensioner, resident of Alga: When the construction of the Aktobe-Kandyagash highway will start?	A tender (bidding process) will be held, and construction is tentatively scheduled to begin in 2019.	Not required
4	Ms.Zh.Zhaksalykova, teacher of the school N2 of Alga district: Please consider the proposal to include toilets and bins along the road.	The project provides for the installation of toilets and garbage cans at all recreation areas and auto pavilions.	Requirements for waste bins are outlined in ***Section B.4.8 - Rest Areas.***
5	Wrap up	The participants noted the importance of road reconstruction for the improvement of the population welfare and reliability/safety of the road traffic in the Aktobe region.	Note required
			

Table 54: Aktobe Oblast Public Consultations (November, 2018)

Date: 9 November 2018
Location: Kandyagash, Mugalzhar district, conference hall of the National University

Panel Members:

1. B.K. Kulmagambetov, deputy Akim of Mugalzhar district
2. M.Mahambetov, Director of KazAvtojol of Aktobe oblast
3. M. Babadzhanova: ADB, Regional environmental safeguards consultant
4. K.Serdaliev.ADB, National social safeguards consultant

Program

1. Provision of information on updated project design approved by state expertise - M.Mahambetov (in Kazakh, power point presentation, map with project design details)
2. Main approaches of ADB Policy statement (2009) on environmental safeguards, content of IEE/EMP and additional environmental impacts surveys of 2018, monitoring program, project institutional responsibilities on EMP implementation – M.Babadzhanova (in Russian, Power Point presentation)
3. Social safeguards and resettlement principles of ADB policies for the Project, Grievance redress mechanism developed for the Project – K.Serdaliev (in Kazakh, power point presentation)

Information brochures were distributed also to participants with information on issues indicated in the program

List of Participants:
30 Participants (See Appendix J)

#	Question / Comment	Answer	IEE Reference
1	Mr.B.K.Kulmagambetov.deputy Akim of Mugalzhar district: The new road will bypass the city of Kandyagash. What will happen to the old road?	The project provides for bypass of Alga and Kandyagash for the purposes of traffic and population safety. The old road will be repaired and then delivered to the local executive bodies.	Not required
2	Ms. S.Sarsenova, resident of Kandyagash: When the construction of the Aktobe-Kandyagash highway will start?	A tender (bidding process) will be held, and construction is tentatively scheduled to begin in 2019.	Not required
3	Several participants noted that they often travel to Aktobe and spend a lot of money to repair their vehicles because of the poor condition of the existing road.	Noted with thanks	Not required
4	Wrap up	The participants noted the importance of road reconstruction for the improvement of the population welfare and reliability/safety of the road traffic in the Aktobe region.	Not required



Table 55: Consultations with Specialists, Aktobe Oblast, 2018

Location: Aktobe

Organization – Department of ecology in Aktobe region, Committee of ecological regulation and control, Ministry of energy

Person met: Jahsygaly Imankulov, Head of Department

#	Issues discussed	Comments
1	What environmental concerns are primary for the reconstruction and upgrading Aktobe-Kandyagash road	Department of ecology of Aktobe will supervise the status of quarries/borrow pit and issue permits for their selection/use (***Noted in Section F.6.3 – Soils***) Also the supervision and monitoring of air quality should be done on regular basis (***addressed as part of the Project EMP***)

Location: Aktobe

Organization – Aktobe territorial division, Regional State Department Zhayik-Caspian Basin Inspection of Regulation of water resources use and protection

Person met: Hobdash Bulteev, Head of Division

	Issues discussed	Comments
1	What water issues can be expected during the project implementation	There are flooding risks from Aktobe water reservoir in spring time. Designers have to take them into account (***Design criteria for bridges and culverts are 100 years and 50 years respectively, as discussed under Section F.6.4 – Hydrology***). The water table of Ilek river can also sharply increase during the snow melting (April-May), erosion of embankments can be observed. The culverts should be bigger and regularly cleaned then (***Noted and discussed under Section F.6.4 – Hydrology***). Contractor should receive permit for special water use and for technical needs during the construction works in accordance with the last Decision of Aktobe Region Maslihat (N282, from 11.04.2018 – On changes for Water resources (surface sources) use charges) (***Noted and discussed under Section F.6.4 – Hydrology).***

Location: Aktobe

Organization – Department of Natural Resources Management and Regulation of Nature use of Aktobe Region

Person met: Akkul Baydauletuly, Head of Department
Ashat Kubenov, Deputy Head of department, Elena Ilemeshkina, Head of Division, Gabit Kalyshbayev, head of Division on forest resources

	Issues discussed	Comments
1	What environmental concerns should be taken into account during the construction	There are no issues regarding the biodiversity or natural forest at this section of the road. Even in case is trees at km 48 (planted as forest strips along the railway) will be cut for the bypass road of Alga city. The trees are not of high value Waste management should be supervised of course. All relevant permissions should be received by Contractor from our Department in accordance with national legislation (***Management of waste is discussed under Section F.8.3 – Waste Management)*** We already saw the OVOs of this project and do not have any special concerns
2	Do you have any issue on bird migration and any issue on its disturbance during the road reconstruction?	No any concern. The water bodies are located rather far from the road. As for bypass roads and bridges over the Ilek river - the construction in this area can be done in summer time. No rare species were observed here so far because this area is used as pastures by livestock (***Limiting construction periods for bridges is discussed under Section F.6.4 – Hydrology)***
3	Any rare, endangered or other important flora and fauna species?	No concerns on this road section from Aktobe to Kandyagash. No saiga, no any other endangered species observed here. As for vegetation – the fields along the road consist of rather poor soils and they used mostly as pastures (***Rare and endangered species, including Saiga, are discussed under F.7.1 – Biodiversity)***

4	What about the polluted soils in area of Alga chemical plant? What the possibility of pollution dissemination (soil, water) in area of new bypass road of Alga city?	The by-pass road is located at the distance of about 10 km up from the waste tailings of the plant. We do not see potential issues here. As for rehabilitation of the road going via Alga city – no excavation works are expected here, there will be pavement works (***potential issues associated with Alga chemical plant are discussed under Section F.6.1 – Soils)***
5	When the project on rehabilitation of polluted area of Alga chemical plant will start?	It was planned that this project would start in 2018 , but due to some circumstances, we expect that it will be implemented next year.
6	Do you have any maps on soil pollution prepared during the OVOs studies in national feasibility study?	It was survey done by national company "Zhasyldamu" – they are planning to arrange new polygon for the waste disposal . We will ask them to send us details and then share the information. We do not expect any major issues with soil and water pollution regarding the area of Aktobe-Kandyagash road section.
Location: Aktobe **Organization –Territorial Inspection of Forest and Hunting, Aktobe Region** **Person met: Kuyanysh Ayazov, Head of Department; specialists of Fish resources division**		
	Do you have any rare or Red data fish species and aquafauna in Ilek river?	No, there are no such species in this part of Ilek river where bypass road will be constructed. Of course the potential impacts and further compensation were estimated already and relevant compensation should be done in accordance with national legislation. But project will not impact heavily or irreversibly the aqua fauna of the river due to the bridge works (***the mitigation measures proposed by the national OVOS have been included as part of Section F.7.1 – Biodiversity)***
	Can you tell about the aviafauna in the areas of Aktobe-Kanduagash road and bypass roads?	No any serious problems we expect because road exists so many years and area is already affected by human activities. The water streams are rather far and in summer time only Ilek river has continuous water flow. Other rivers beds crossed by bridges to be rehabilitated are dry starting from June or July till almost February (***Limiting construction periods for bridges is discussed under Section F.6.4 – Hydrology).***
	Any other concerns?	Do not see any special impacts that can not be mitigated.

H.2 Planned Information Disclosure

532. It is anticipated that in compliance with ADB's SPS (2009) the document will be provided for disclosure on the ADB website and the KazAvtojol Website (in local language).

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

H.3 Grievance Mechanism

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

H.3.1 Levels and Procedure for Grievance Redress

535. The Grievance Redress Mechanism (GRM) is available to people living or working in the areas impacted by the project activities. Any person impacted by or concerned about the project activities has the right to participate in the GRM, should have the easy access to it, and be encouraged to use it. The proposed GRM does not replace the public mechanisms of complaint and conflict resolution envisaged by the legal system of the RoK, but attempts to minimize use of it to the extent possible.

536. Overall responsibility for timely implementation of GRM lies with the MID through KazAvtojol supported by the Engineer involved in managing and supervising the civil works, while Contractor undertakes the actual civil works. Relevant oblast, rayon and community Akimats, who are mandated by law to perform grievance redress related tasks, and mediators / non-governmental organizations (NGO), who are involved in facilitating amicable resolution of grievances are also included in GRM.

537. This GRM envisages two levels of grievance resolution for the road sector projects implemented under the supervision of KazAvtojol: Grievance Redress Committees (GRC) at regional (oblast) and central (Astana) levels in accordance with the Guideline on Grievance Redress Mechanism on Environment and Social Safeguards for Road Sector Projects approved by the Committee of Roads (COR) in August 2014 (GRM Guideline). GRCs are usually composed of members nominated from COR, Akimats, KazAvtojol, Engineer & Contractor. GRCs at regional and central levels are chaired by the Heads responsible for the overall operation of GRM and its efficient and timely implementation, while the Coordinators are responsible for involving the relevant parties and coordinating the works of GRCs at regional/central levels.

GRM: Regional (Oblast) Level

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

539. *Grievance registration*: complainants or concerned individuals can visit, call or send a letter or e-mail or fax to community Akimat, grievance focal point at either the Contractor, the Engineer or KazAvtojol. Receipt of grievances lodged in person, via phone, through a letter or e-mail or fax will be acknowledged. GRC at the regional level also considers the anonymous complaints, in case the complainant refuses to provide contact details or no contact information is available in the grievance received by e-mail / mail / fax.

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

541. *Feedback provision*: Receipt of grievances lodged in person or via phone will be acknowledged immediately. Receipt of grievances received through a letter or e-mail or acknowledged through a letter / e-mail / fax within 3 working days upon receipt by GRC coordinator at regional level. In case the grievance is not related to project activities or impacts generated due to the project implementation and cannot be considered under this GRM Guideline, the feedback will be provided to the complaining party specifying to which entity (community / rayon / oblast level Akimat, as relevant) it has been forwarded.

542. If grievance was resolved at regional level, the complaining party will be informed of the outcome. If grievance was not resolved at the regional level and was passed to the GRC

at the central level for consideration and resolution, appropriate information will be provided to the complaining party, including the date when the case was passed to GRC at the central level and the date by which the outcome at the central level is expected.

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

GRM: Central Level

544. Following unsuccessful consideration of grievance by GRC at the regional level, complaint resolution will be attempted at a central level through following steps.

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

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

547. For anonymous grievances or in cases when the complainant refused to provide contact details, the information on status of grievance redress and outcomes of resolution process will be posted on the information boards of KazAvtojol and relevant community / rayon / oblast Akimats.

GRM: Legal System

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

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

H.3.2 Grievance Focal Points

550. Affected persons or other concerned individuals may visit, call or send a letter or fax to GRC at the regional level for Aktobe Oblast.

GRC Contact Details in Aktobe Oblast (Regional Level):

Aktobe regional branch of JSC «NC KazAutoZhol» (KAZAK)
Address: 89 Maresyev str., Aktobe
Phone: 8 (7132) 55-50-15, 54-76-29, 54-98-838
Fax: 8 (7132) 54-65-71
E-mail: a.muhanbetkaliev@kazautozhol.kz

Akimat of Aktobe Oblast
Address: 40 Abylkhayir khan ave., Aktobe

Phone: 8 (7132) 56-77-82
E-mail: info@akto.kz

Akimat of XXX Rayon
Address:
Phone:
E-mail:

Akimat of XXX Rayon
Address:
Phone:
E-mail:

551. At the Central GRC the key persons are:

- Head of GRC: Kalymov E. - Heal of Department of Investment Projects Implementation;
- Coordinator of GRC: Akhmetov B. - Leading Specialist of Department of Investment Projects Implementation;
- Coordinator of GRC: Ibrayeva D. - Leading Specialist of Department of Projects Preparation.

GRC Contact Details (Central Level):

Address: 32/1 Kabanbay Batyr ave., Astana, 010000, Kazakhstan, Committee of Roads, Ministry of Investments and Development of the Republic of Kazakhstan
Tel: +8 (7172) 75-46-41
E-mail: a.karymbaeva@mid.gov.kz

H.3.3 Communication

552. Prior to start of site works, the Contractor shall:
- Communicate the GRM to communities in the project impact zone.
- Set-up and publicize a 24-hour hotline for complaints.
- Ensure that names and contact numbers of representatives of GRC and the Contractor are placed on the notice boards outside the construction site.

ADB Accountability Mechanism Policy, 2012

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

H.3.4 Disclosure of the Grievance Process

554. The complaints resolution process was presented formally during the public consultations. The grievance redress mechanism will also be presented during routine community meetings in the Project area during the construction phase of the Project.

I. Conclusions and Recommendations

I.1 Conclusions

555. The IEE and its consultation process established that there were no significant environmental issues that could not be either totally prevented or adequately mitigated to levels acceptable Kazakhstan and international standards. As such, based on the existing ADB Safeguards Policy (2009), this Project falls under ADB's **Category B**.

I.2 Recommendations

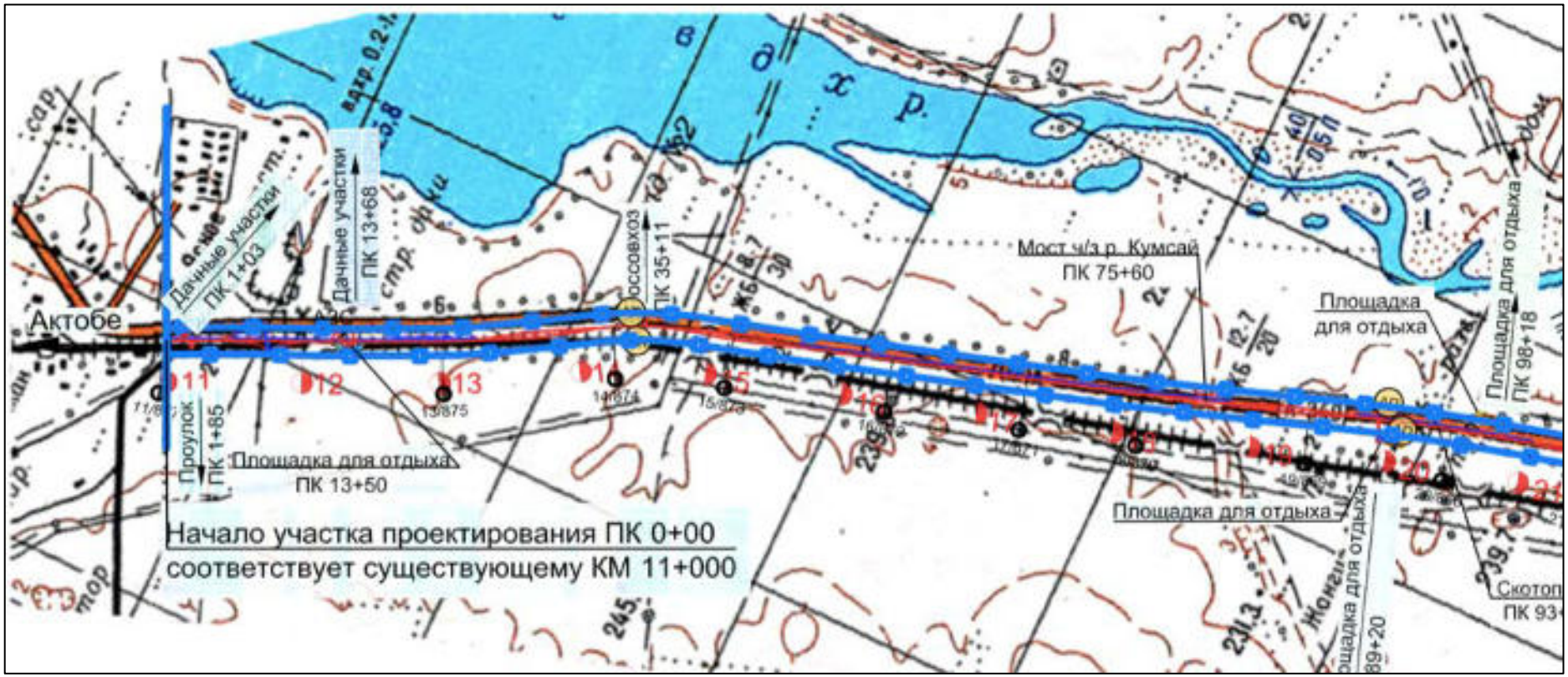
556. The EMP, its mitigation and monitoring programs, contained herewith will be included within the Bidding documents for project works for all Project components. The Bid documents state that the Contractor will be responsible for the implementation of the requirements of the EMP through his own SEMP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

557. The EMP and all its requirements will then be added to the Contractors Contract, thereby making implementation of the EMP a legal requirement according to the Contract. He will then prepare his SEMP which will be approved and monitored by the Engineer and the PIU. Should the Engineer note any non-conformance with the SEMP (and the EMP) the Contractor can be held liable for breach of the contractual obligations of the EMP. To ensure compliance with the SEMP the Contractor should employ an Environmental Officer to monitor and report Project activities throughout the Project Construction phase.

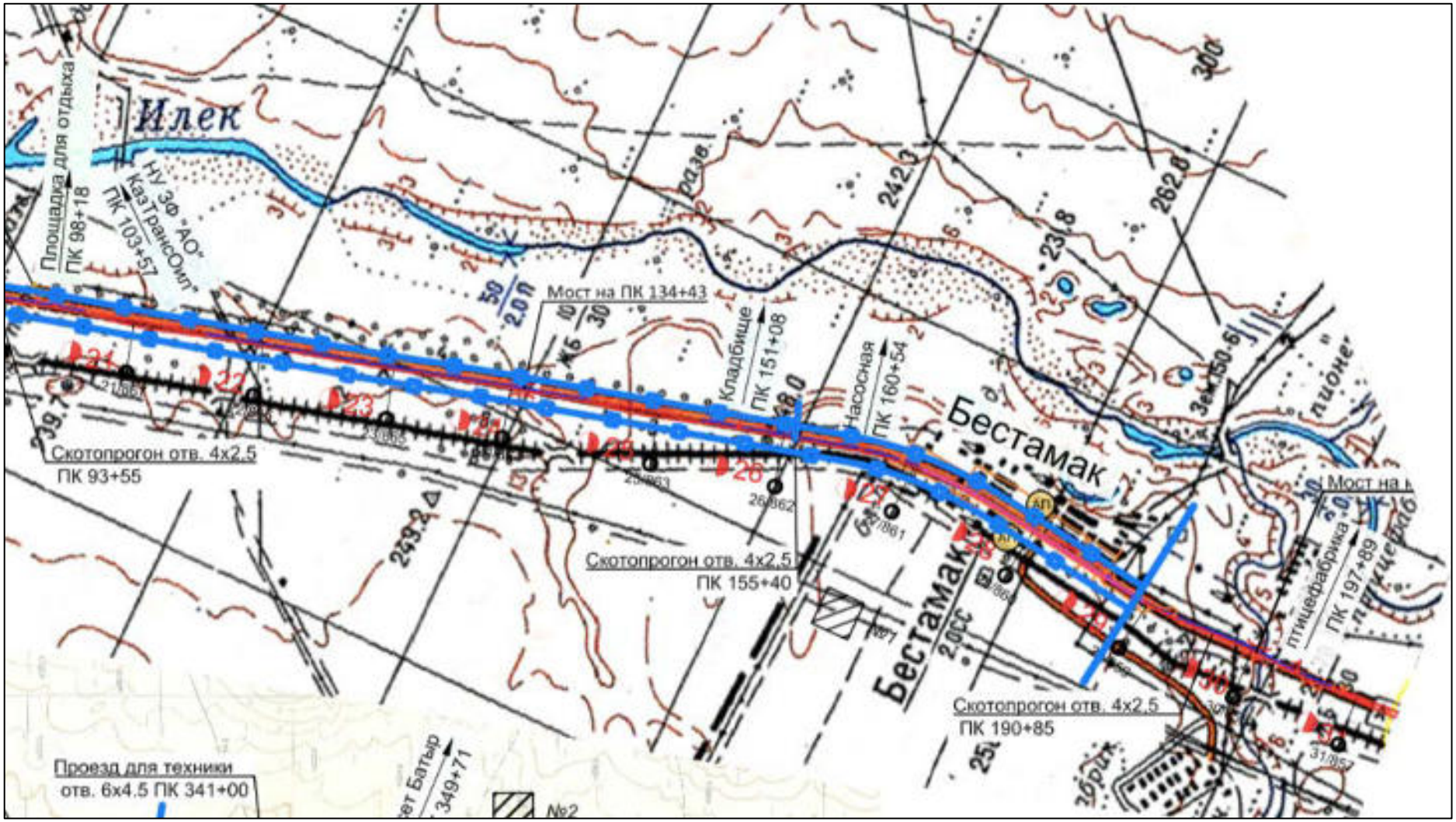
APPENDIX A

PROJECT ROAD MAPS

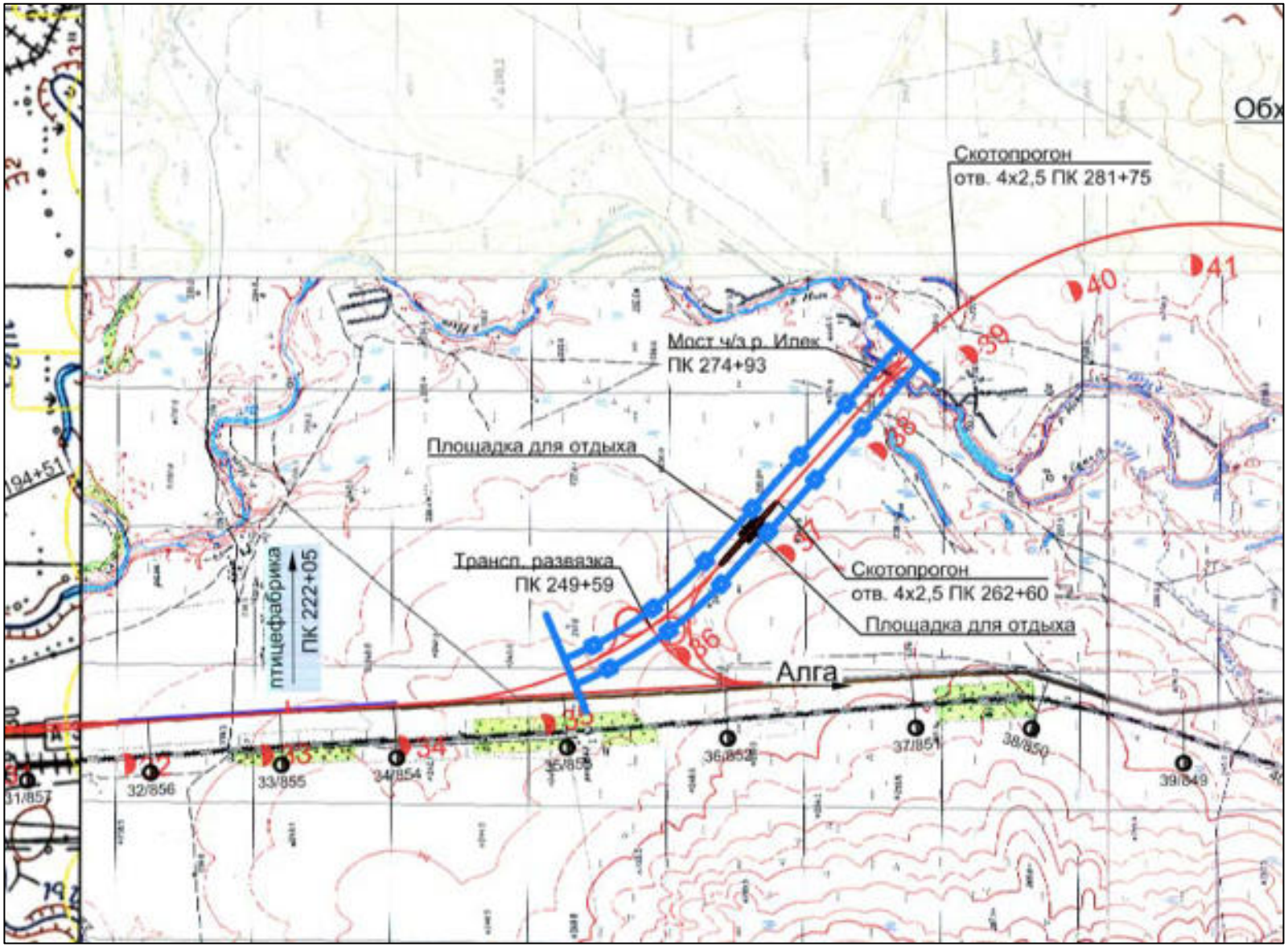
КМ 11-21


Актобе
Дачные участки
ПК 1+03
Дачные участки
ПК 13+68
Совхоз
ПК 35+11
Мост ч/з р. Кумсай
ПК 75+60
Площадка
для отдыха
Площадка для отдыха
ПК 98+18
Проулок
ПК 1+65
Площадка для отдыха
ПК 13+50
Начало участка проектирования ПК 0+00
соответствует существующему КМ 11+000
Площадка для отдыха
Площадка для отдыха
Скотоп
ПК 93
11
12
13
15
19
20

КМ 21-31


Илек
Площадка для отдыха
ПК 98+18
НУ ЗФ "АО" КазТрансОйл"
ПК 103+57
Мост на ПК 134+43
Кладбище
ПК 151+08
Насосная
ПК 160+54
Бестамак
Скотопрогон отв. 4х2,5
ПК 93+55
Скотопрогон отв. 4х2,5
ПК 155+40
Скотопрогон отв. 4х2,5
ПК 190+85
Птицефабрика
ПК 197+89
Проезд для техники
отв. 6х4.5 ПК 341+00
№2

КМ 31 – 41


Скотопрогон
отв. 4х2,5 ПК 281+75
Мост ч/з р. Илек
ПК 274+93
Площадка для отдыха
Трансп. развязка
ПК 249+59
Скотопрогон
отв. 4х2,5 ПК 262+60
Площадка для отдыха
птицефабрика
ПК 222+05
Алга
40
41
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36
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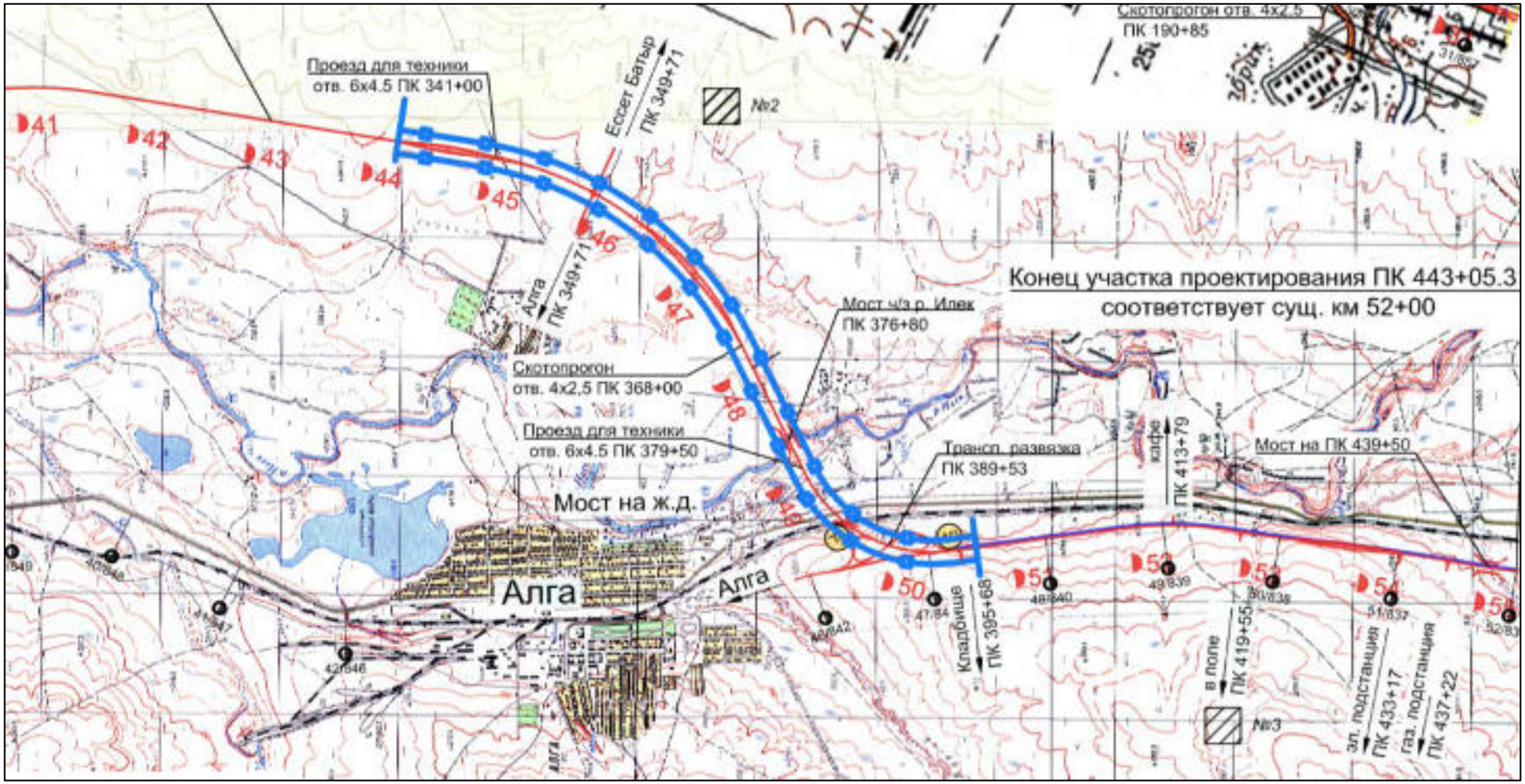
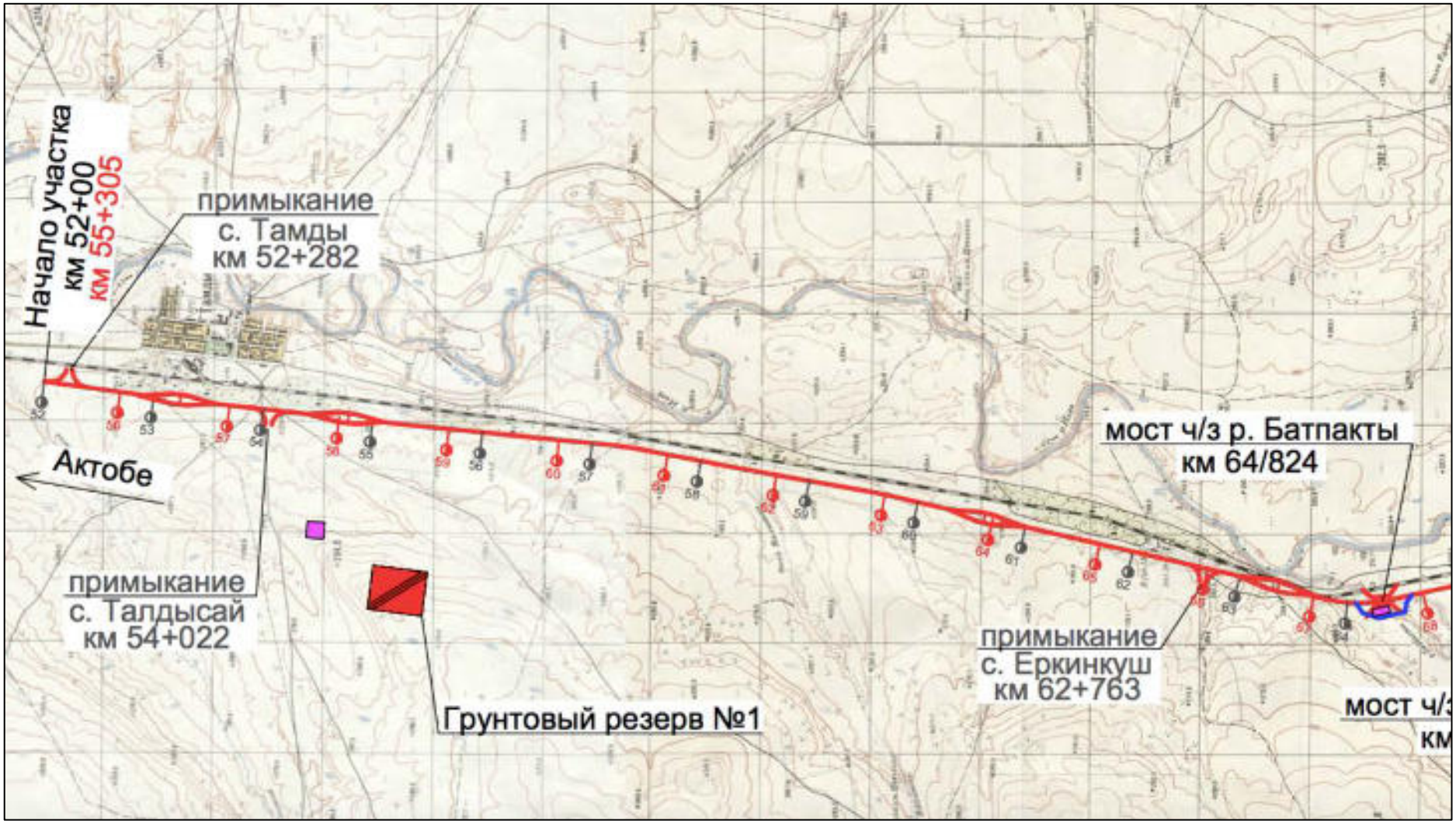
32
31/857
32/856
33/855
34/854
35/853
36/852
37/851
38/850
39/849

КМ 41 - 56


Проезд для техники
отв. 6х4.5 ПК 341+00
Ессет Батыр
ПК 349+71
№2
Скотопрогон отв. 4х2.5
ПК 190+85
Алга
ПК 349+71
Скотопрогон
отв. 4х2,5 ПК 368+00
Мост ч/з р. Илек
ПК 376+80
Конец участка проектирования ПК 443+05.3
соответствует сущ. км 52+00
Проезд для техники
отв. 6х4.5 ПК 379+50
Мост на ж.д.
Трансп. развязка
ПК 389+53
ПК 413+79
Мост на ПК 439+50
Алга
Алга
Кладбище
ПК 395+68
в поле
ПК 419+55
№3
эл. подстанция
ПК 433+17
газ. подстанция
ПК 437+22

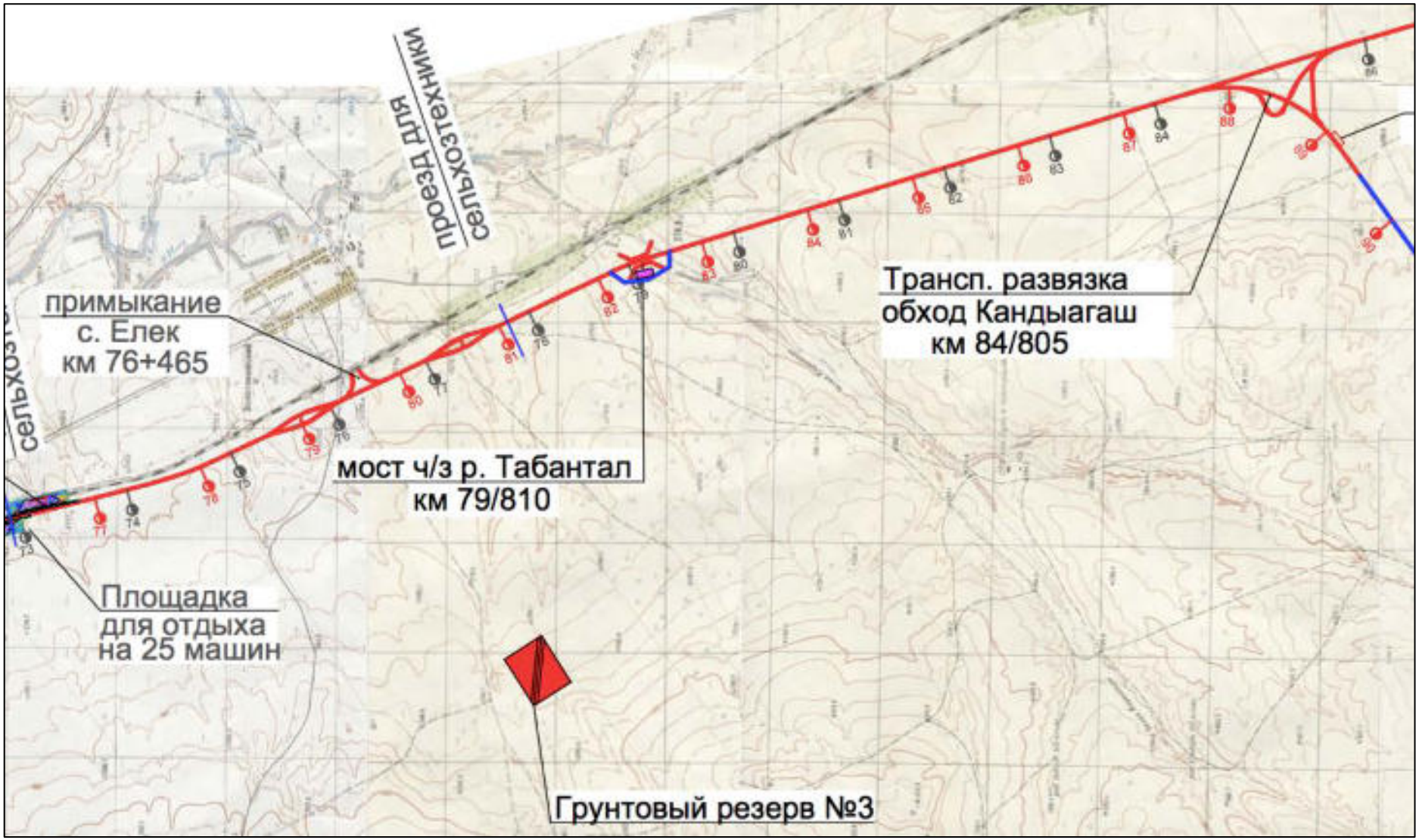
КМ 56 - 68


Начало участка
км 52+00
км 55+305
примыкание
с. Тамды
км 52+282
Актобе
примыкание
с. Талдысай
км 54+022
Грунтовый резерв №1
мост ч/з р. Батпакты
км 64/824
примыкание
с. Еркинкуш
км 62+763

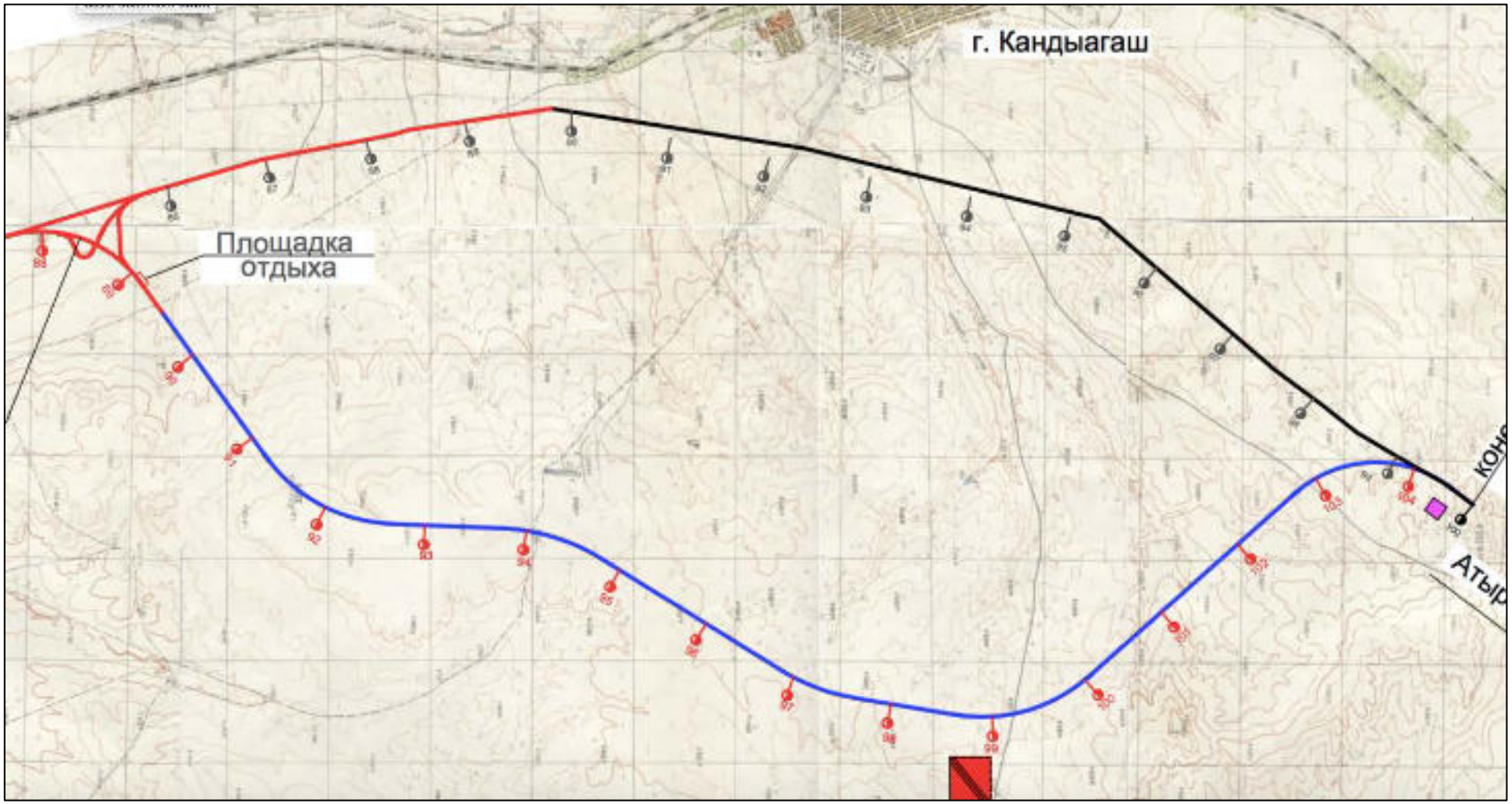
КМ 67 - 78


Батпакты
824
мост ч/з р. Таласбай
км 67/821
примыкание
с. Аккемер
км 71+246
Площадка
для отдыха
на 25 машин
проезд для
сельхозтехники
примыкание
с. Елек
км 76+465
Площадка
для отдыха
на 25 машин

КМ 77 – 90


проезд для сельхозтехники
примыкание
с. Елек
км 76+465
мост ч/з р. Табантал
км 79/810
Трансп. развязка
обход Кандыагаш
км 84/805
Площадка
для отдыха
на 25 машин
Грунтовый резерв №3

KM 88 - 104



APPENDIX B

ENVIRONMENTAL SETTING

The following section provides a summary of the existing conditions, both illustrative and descriptive, along the route to enable the reader to understand the general environmental setting of the project.

Plate B.1: KM 11 - Beginning of the road. There are residential houses from the right side of the road (distance from the edge of the road is about 30-35 m)

Plate B.2: KM13: Trees managed by the government adjacent to the road, but outside of the RoW.

Plate B.3: The railway goes along the project road (right side).

Plate B.4: KM18+561 – a three-span reinforced concrete bridge across the riverbed of the Kumsai River, flowing into the Aktyubinsk reservoir. The bridge, oriented from the north-west to the south-east, has a rectangular shape with dimensions of 54.6 × 8.15 m (length and width). The width of the roadway is 11.7 m, the height is 4.0 m. The roadway of the bridge is asphalt concrete, on both sides there are pedestrian walkways, protected from the roadway by concrete slabs with a height of 0.4 m. The edges of the bridge are 1.2 m.

Plate B.5: KM20. Entering Alga district

Plate B.6: Aktobe reservoir can be seen (the distance from the road is about 500 m-1 km and more from the road).

Plate B.7: KM24+98 - The following bridge structure is in the form of a reinforced concrete two span beam bridge across the dry bed of the tributary to the Aktobe reservoir. The bridge has a rectangular shape and is oriented from the north-west to the south-east. The length of the bridge is 37.40 m, width - 8.15 m, width of the carriageway - 8.3 m, height - 4.3 m.

Plate B.8: Livestock crossing the road

Plate B.9: КМ 26+391–км29+40 : The most difficult part of the route passes within the boundaries of the Bestamak village. It is characterized by its passage in close proximity to residential houses, a large number of communications and networks, and junctions of secondary roads and spontaneous ramps[19].

[19] There is a large number of shops located at km 27 + 381, km 27 + 617, km 27 + 920, km 28 + 9, km 28 + 66 on the left side of the route. There is a large number of roadside service facilities also on the right side of the road among the buildings, adjacent to the highway, namely: **km 27 + 465** – service station, **km 27 + 499, km27 + 692, km 27 + 933, km 28 + 366, km 28 + 583** - a group of shops, **km 27 + 890** - mosque and catering facilities as "Express" cafe (**km 27 + 709**), "Urker" (**km 28 + 464**), "Caravan" (**km 28 + 484**).

Plate B.10: KM29+40. End of the Bestamak village at KM29+40

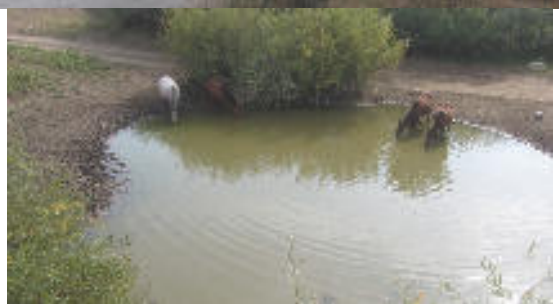


Plate B.11: KM35+50. The road crosses Batpakty river via three span beam reinforced concrete bridge. The bridge is oriented from the north-east to the south-west, has a rectangular shape (8.15 × 21,0 m), height is 3.7 m. The bridge has asphalt concrete covering, the width of the carriageway is 5.30 m, pavement part has a width up 1.0 m. Condition of asphalt concrete pavement and pavement part of the bridge is unsatisfactory, there are deformations and fractures can be observed. There is a metal rails with a height of 1.2 m from both sides of the bridge. River bed is almost dry (only

At **km 28 + 426** the highway on the right side intersects with the secondary road leading to the railway crossing and the oil loading station.
Km 28 +580: grader of the gas distribution station GDS-3 adjoins the to the highway from the right side.
Km 28 + 630 : the road intersects with the secondary road, which goes to the mausoleum "Eset Batyr". This 4 km stretch of secondary road is of cultural importance for the population.
Km 28 + 697 and **Km 28 + 788** (right side of the road) : asphalted passage and exit part of the Gas station.

small pond left from this seasonal river (left side of the road) and vegetated by willows, oleaster, grass and bushes

Plate B.12: Further on km 30 + 166, km 30 + 385, km 33 + 55 highway (from the left side) intersects with secondary roads, which are going (km 30 + 166, km 30 + 385) to the Bestamak poultry farm and to the poultry farm "Ak-kus" (km 33 + 55)

Plate B.13: Typical view of landscapes along the Aktobe-Kandyagash road

Plate B.14: KM37. Cemetery from the right side of the road

Plate B.15: At km 39 + 41 to km 39 + 920 the road has a division into traffic flows. This traffic situation is due to the passage road through the dry river bed "Suyk su" and has two independent bridges structure. The bridge structure is 39 + 482 km (the Aktobe-Alga stream) is presented in the form of reinforced concrete two span beam bridge passing through the river bed "Suyk su". The bridge has a rectangular shape and oriented from north to south. The length of the bridge is 42.20 m, width 14.50 m, width of the carriageway 7,5 m, height 4.1 m.
The second bridge structure across the river "Suyk su" is at km 39 + 474 and is represented by a two-span bridge structure. Bridge is oriented from the north to the south, has an asphalt-concrete covering of width 5.5 m. On the edges of the bridge there is a metal fence with a height of 1 m. Bridge Support is of rectangular shape.

Plate B.16: KM 40. Entrance of Alga city

Plate B.17: KM40 + 84 -KM42 + 300 : there are wastewater (filtration fields) of the closed Alga chemical plant (the nearest distance from the road is 50 m, left side. The area of filtration fields currently is partially dry and covered by crust and vegetation, partially with water

Plate B.18: Closed Alga chemical plant

Plate B.19: The road in Alga - it will be rehabilitated within the existing ROW

Plate B.20: Alga city: The existing road is crossed by railway

Plate B.21: The planned bypass road of the Alga city starts at km34 + 314 and ends at km 47 + 234. Starting from km 34 + 314 the route changes direction from the south to the southeast, and runs 3.5 km along the plain to the Ilek riverbed. Delta heights in the first part of the plot was 9 m with a slope toward the river. The projected by-pass route crosses the Ilek river bed at the PC 384 + 62. The width of the water mirror at the intersection was 28 m in July 2015. The banks of the Ilek River at the intersection are steep, overgrown with reeds.

Further, the route changes direction to the south-west out of lowland to the plain. From PC 415-to PC 458, the elevation difference is 2.5 m. At the PC 425 + 55, the projected route crosses the 35 kV overhead line at an angle of 35 °, in the immediate vicinity (2 m) of the tower N135.
(PC 459 + 69), the projected route crosses the asphalt road which goes to the village. The width of the asphalt concrete road is 6 m, the height of the embankment at the intersection is 0.5 m.
Further the route turns and the relief comes down to the Ilek river bed. The proposed location of the intersection is PC 468 + 37. The width of water mirror at the intersection was 70 m, the width of the floodplain is 270 m.

Plate B.22: Further the route approaches the infrastructure engineering networks AO "KTZ" (PK494-PK496). There are forest belts (consisted mainly from elm and oleaster trees), communication and signaling cables, lines, and a double-track railway line. The proposed project by-pass road ends at KM47 + 234

Plate B.23: KM52. Bridge – the riverbed is dry

Plate B.23: KM54 and KM62. There are cemeteries located at the distance of about 30-40 m from the edge of the road

KM64. Bridge over Batpakty river. The river bed is also almost dry, only small pond with water was observed.

KM67. Bridge over Talasbay river – riverbed is dry from both sides of the bridge and densely vegetated mainly by willow, oleaster, reed, gooseberry bushes

KM68. The future quarry site proposed for the road is located at the distance of 2 km from the road (right side)

KM79. Coming close to Akkemer settlement (Mulgazhar district)

KM71+500. Cemetery is located at the distance of 20 m from the edge of the road

KM79. Bridge over Tabantal river – riverbed is dry currently from both sides

Road surface is heavily deteriorated

Km93. Existing quarry in Mugalzhar district near the Kandyagash settlement. There are 3 gravel plants in this district

Constructions of the second bypass road of Kandyagash city will start at KM84+805. Fields are covered by typical vegetation as feather grasses, sagebrush (wormwood, Artemisia), fescue (grass).

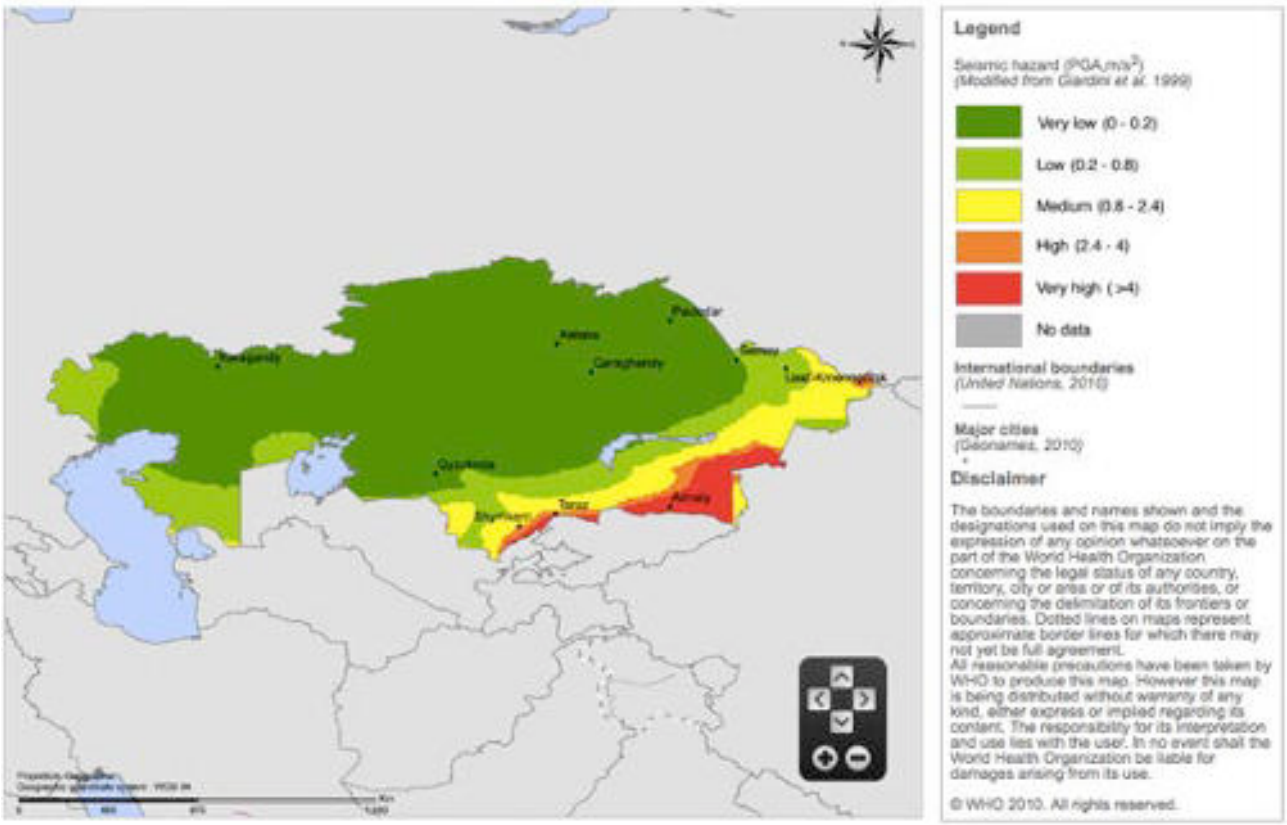
Area around km 99 (almost end of the road) – hedgehog is a typical representative of fauna here

Km100. End of the road section

Wide distributed steppe grasses – representatives of vegetation of the fields where by-pass road will be constructed. No Red Book, endangered flora species are grown in the areas allocated for the construction of by-pass roads in Alga and Mugalzhar districts as confirmed by the Department of natural resources management (Akimat of Aktobe Province)

APPENDIX C

SIESMIC HAZARD MAP



APPENDIX D

SCOPE OF WORKS FOR AIR QUALITY MONITORING AND MONITORING LOCATIONS

Air Quality Monitoring

Locations: Two locations as follows and indicated by Appendix A.

- 50°11'36.78"N 57°16'38.39"E
- 50°02'46.41"N 57°20'46.79"E

Monitoring Parameters and Period:

For each location

- SO2: 10 minute averaging period. Twice in one day, morning and afternoon.
- NO2: 1 Hour averaging period. Twice in one day, morning and afternoon.
- TSP: 20-30 minute averaging period. Twice in one day, morning and afternoon.
- CO: 20-30 minute averaging period. Twice in one day, morning and afternoon.

Equipment: In compliance with international standard requirements. Before and after each cycle of measurements the equipment must be re-calibrated. Equipment type should be outlined in the monitoring report, including information on calibration.

Reporting: Provide results in tabular format against National standards. Include weather conditions (wind speed and direction). Provide photographic evidence of monitoring at each location. The report should include descriptive notes of the area.

Weather: Record conditions as above for noise. Measurement should be taken on a day with a calm to gentle breeze and without rain. Some conditions to avoid are high wind (generally, do not conduct the assessment if the wind is higher than 5 meters/second (m/s)), or rain.

Air Monitoring Locations (air yellow)

APPENDIX E

AIR QUALITY MONITORING RESULTS

Testing laboratory TOO «Research Institute «Batysecoproject»
Republic of Kazakhstan, Aktobe, 41 site, zone N 801
Phone 8-7132-98-78-00, fax 8-7132-98-78-08
Accreditation certificate № KZ.I.05.0903 from 15.09.2015

Test results №1

Parameter	**Air**
Client	**Nick Skinner**
Date of testing	**25.09.2018 г.**
Sampling point	**Aktobe, 41-site, House N 34**
Air volume while conduction of measurements by chemical cassette	**0,45 l/min**
Air volume while conduction of measurements by device	**1,8 l/min**
	GOST 17.2.4.05-83 **GOST 17.2.4.02-81** **GOST17.2.6.02-85**
Weather conditions	**Temperature from +19,7 to +18,7 ^{0}C** **Humidity 44-40 %** **Pressure 745,6-745,1 mm of mercury column (mm m.c.)** **Wind 3 m/s South – 3 m/sec South-East**

№ п/п	Location of measurement (sampling point)	Results of measurements, mg/m^3			
		SO_2	NO_2	Suspended particles	CO
1.	50°11’36.78”N 57°16’38.39”E (morning)	0,0233	0,00912	0,0196	0,664
2.	50°11’36.78”N 57°16’38.39”E (evening)	0,0159	0,00909	0,0463	0,633
Standard		**0,5**	**0,2**	**0,5**	**5,0**

Executed: Engineer-environmentalist Urgenshpaev N.M.

Approved: Head of laboratory Bakytzhanova A.A.

Phone 8-7132-98-78-00, fax 8-7132-98-78-08
Accreditation certificate № KZ.I.05.0903 from 15.09.2015

Test results №1

Sampling point	**Атмосферный воздAiryx**
Air volume while conduction of measurements by chemical cassetкассеты	**Nick Skinner**
Air volume while conduction of measurements by датчиков	**25.09.2018**
Sampling point	**Bestamak village, Eset-batyra street**
Air volume while conduction of measurements by chemical cassette	**0,45 l/min**
Air volume while conduction of measurements by device	**1,8 l/min**

Weather conditions — **Temperature: from +16,0 to +13,0 ^{0}C**
Humidity: 55-47 %
Pressure : 744,9-744,7 mm of m.c.
Wind 4 m/sec South-East – 3 m/sec South

№ п/п	**Location of measurement (sampling point)**	**Results of measurements, mg/m^3**			
		SO_2			**SO_2**
1.	50°02’46.41”N 57°20’46.79”E (morning)	0,00825	0,00911	0,0216	0,118
2.	50°02’46.41”N 57°20’46.79”E (evening)	0,0115	0,00914	0,0231	0,622
Standards		**0,5**	**0,2**	**0,5**	**5,0**

Executed: Engineer-environmentalist — Urgenshpaev N.M.

Approved: Head of laboratory — Bakytzhanova A.A.

APPENDIX F

SCOPE OF WORKS FOR NOISE MONITORING AND MONITORING LOCATIONS

Noise monitoring

Locations: Four locations as follows and indicated by Appendix A.

- 50°11'36.78"N 57°16'38.39"E
- 50°03'11.63"N 57°20'53.48"E
- 50°02'46.41"N 57°20'46.79"E
- 49°48'51.39"N 57°20'25.98"E

Monitoring Period: Hourly for 24 hours. Measurements frequency should be at 1 sec. intervals (or less). Acquired data should be organized as daily measurements divided in hourly intervals, as well as expressed in Leq (Equivalent Level of Noise) - for Day and Night separately. Measurements to be performed using the equipment carrying capability with parameters no less than given below in "Equipment" section. During the measurements the description of the location of the sensor (coordinates, site, address, type of receptor, photo documentation) must be taken, recorded, reported and kept.

Parameters: L_{Aeq},

Equipment: In compliance with international standard requirements, measurements should be done using integrated CLASS I noise meters, calibrated in the certified Centres. Before and after each cycle of measurements the equipment must be re-calibrated according to the prescriptions of D.M. 16.03.1998, using relevant instruments to comply with Norm IEC 942 -Class I, and having a degree of precision higher than the phonometer used.

Reporting: Provide results in tabular format against National standards. Include weather conditions (wind speed and direction). Provide photographic evidence of monitoring at each location. The report should include descriptive notes of the area (use of territory, presence of obstacles, main noise source and presence of other noise sources).

Weather: Record the weather conditions that could affect measurements. Monitor wind speed at the measurement location, using an anemometer, and record the wind speed together with the wind direction. Exercise caution when making measurements in poor weather conditions such as wind speeds greater than 5 m/s^{-1}. Visually estimate cloud cover by eye as either a percentage of sky covered by cloud or in oktas. Record all forms of precipitation together with the period over which the precipitation occurred, having regard to how this might affect uncertainty (see Clause 10 and Annex B). Record the temperature at the measurement location, in °C, at the beginning and the end of the measurement period, and at any other appropriate time if there is a change in the weather conditions.

Noise Monitoring Locations (noise red)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APPENDIX G

NOISE MONITORING RESULTS

Testing laboratory TOO «Research Institute «Batysecoproject»
Republic of Kazakhstan, Aktobe, 41 site, zone N 801
Phone 8-7132-98-78-00, fax 8-7132-98-78-08
Accreditation certificate № KZ.I.05.0903 from 15.09.2015

Test results

Всего листов 1

Parameter **Noise level**
Client: **Nick Skinner**
Sampling point **Bestamak village, Eset-batyra street, house 82**
Date of measurements **26.09.2018**

Location of sampling point and time		t, ^{0}C	U, %	P, mm of m.c..	F, m/sec direction	Methods of testing ND	Standards	Received data, dBA
50°03’11.63”N 57°20’53.48”E	01:00	11	62	745.4	4 south, south-east	GOST 12.1.005-88 GOST 12.1.050-86 GOST 12.1.012-2004 GOST 12.4.012-83 GOST 12.1.036-81 GOST 12.1.049-86	45,0	44,0
	02:00	11	62	745.4	2 south, south-east			42,0
	03:00	12	63	745.4	4 south-east			40,0
	04:00	11	67	745.4	4 south-east			38,0
	05:00	10	67	745.3	4 south, south-east			39,0
	06:00	9	71	745.2	4 south, south-east			41,0
	07:00	9	71	745.2	4 south, south-east			44,0
	08:00	11	62	746.1	4 south, south-east		55,0	48,0
	09:00	15	45	746.4	4 south, south-east			50,0
	10:00	19	32	746.7	4 south, south-east			51,0
	11:00	22	27	746.1	4,5 south			49,0
	12:00	23	25	746.2	4,7 south			50,0
	13:00	25	22	746.3	4,2 south			53,0
	14:00	24	24	746.2	4,3 south			50,0
	15:00	25	22	746.3	4,7 south			49,0
	16:00	25	22	745.5	4,6 south			53,0
	17:00	24	24	745.5	4,6 south			50,0
	18:00	24	24	745.5	4,6 south			52,0
	19:00	23	25	745.4	4,5 south, south-west			53,0
	20:00	19	30	745.1	3 south, south-west			54,0
	21:00	18	32	745.1	3 south, south-east			52,0
	22:00	18	32	745.1	4,5 south, south-east			50,0
	23:00	16	34	744.9	4 south, south-east			48,0

	00:00	16	34	744.9	4 south, south-east		45,0	43,0

Executed: Engineer-environmentalist Urgenshpaev N.M.

Approved: Head of laboratory Bakytzhanova A.A.

Testing laboratory TOO «Research Institute «Batysecoproject»
Republic of Kazakhstan, Aktobe, 41 site, zone N 801
Phone 8-7132-98-78-00, fax 8-7132-98-78-08
Accreditation certificate № KZ.I.05.0903 from 15.09.2015

Test results

Parameter	**Noise level**
Client	**Nick Skinner**
Sampling point	**Tamdy village**
Date of measurements	**26.09.2018**

Location of sampling point and time		t, ^{0}C	U, %	P, mm of m.c..	F, m/sec direction	Methods of testing ND	Standards	Received data, dBA
49°48’51.39”N 57°20’25.98”E	01:00	12	55	734.0	4,1 south-east	GOST 12.1.005-88 GOST 12.1.050-86 GOST 12.1.012-2004 GOST 12.4.012-83 GOST 12.1.036-81 GOST 12.1.049-86	45,0	43,0
	02:00	12	56	734.0	4,6 south-east			42,0
	03:00	11	56	734.1	4,5 south-east			40,0
	04:00	11	57	734.1	4,3 south-east			38,0
	05:00	11	57	734.2	4,6 south-east			39,0
	06:00	12	55	734.4	4,2 south			42,0
	07:00	12	53	734.6	4,5 south			44,0
	08:00	12	50	734.7	4,6 east, south-east		55,0	48,0
	09:00	16	43	734.9	4,1 south-east			53,0
	10:00	18	30	735.0	4,3 south-east			51,0
	11:00	21	25	735.1	4,7 south, south-east			50,0
	12:00	22	23	735.0	4,5 south-east			52,0
	13:00	24	20	734.7	4,4 south-east			53,0
	14:00	24	19	734.3	4,5 south-east			51,0
	15:00	24	19	734.3	4,3 south-east			53,0
	16:00	23	19	734.2	4,2 south-east			54,0
	17:00	23	18	734.1	4,5 south			51,0
	18:00	20	22	734.1	4 south			50,0
	19:00	19	25	734.1	3,5 south			54,0
	20:00	17	28	734.3	3 south, south-east			52,0
	21:00	16	30	734.3	3,2 south-east			50,0
	22:00	16	31	734.3	3,5 south			48,0
	23:00	15	34	734.2	4,5 south-east			46,0
	00:00	14	33	734.2	4,2 south-east		45,0	43,0

Executed: Engineer-environmentalist Urgenshpaev N.M.

Approved: Head of laboratory Bakytzhanova A.A.

Testing laboratory TOO «Research Institute «Batysecoproject»
Republic of Kazakhstan, Aktobe, 41 site, zone N 801
Phone 8-7132-98-78-00, fax 8-7132-98-78-08
Accreditation certificate № KZ.I.05.0903 from 15.09.2015

Test results

Parameter **Noise level**
Client **Nick Skinner**
Sampling point **Bestamak village, in the center of the Eset-batyra street**
Date of measurements **27.09.2018**

Location of sampling point and time		t, ^{0}C	U, %	P, mm of m.c..	F, m/sec direction	Methods of testing ND	Standards	Received data, dBA
50°02’46.41”N 57°20’46.79”E	01:00	16	31	744.9	4,5 south, south-east	GOST 12.1.005-88 GOST 12.1.050-86 GOST 12.1.012-2004 GOST 12.4.012-83 GOST 12.1.036-81 GOST 12.1.049-86	45,0	42,0
	02:00	17	32	744.3	4,5 south, south-east			41,0
	03:00	16	34	744.3	4,5 south-east			40,0
	04:00	17	32	744.3	4,6 south			38,0
	05:00	17	32	744.3	4 south, south-east			38,0
	06:00	16	34	743.5	3 south			43,0
	07:00	16	36	743.5	3 south, south-east			44,0
	08:00	15	39	743.4	3 юг, south-west		55,0	49,0
	09:00	14	67	744.1	4 west			50,0
	10:00	14	72	744.1	4,2 north-west			51,0
	11:00	13	88	744.0	4,4 north-west			51,0
	12:00	13	82	744.0	4,5 north-west			52,0
	13:00	11	94	744.6	4,8 west, north-west			53,0
	14:00	10	94	744.5	4,8 west, north-west			53,0
	15:00	10	94	743.8	3 north-west			52,0
	16:00	9	100	744.4	4 north-west			50,0
	17:00	9	94	743.8	3 west			51,0
	18:00	9	100	743.8	2 west			52,0
	19:00	9	94	743.0	3 west			54,0
	20:00	8	93	743.7	4,4 west			52,0
	21:00	7	100	743.6	3 west, south-west			49,0
	22:00	7	93	743.6	4 south-west			47,0
	23:00	7	100	742.8	4 west, south-west			46,0
	00:00	7	93	742.8	4 west, south-west		45,0	41,0

Executed: Engineer-environmentalist Urgenshpaev N.M.

Approved: Head of laboratory Bakytzhanova A.A.

Testing laboratory TOO «Research Institute «Batysecoproject»
Republic of Kazakhstan, Aktobe, 41 site, zone N 801
Phone 8-7132-98-78-00, fax 8-7132-98-78-08
Accreditation certificate № KZ.I.05.0903 from 15.09.2015

KZ.И.05.0903

Test results

Parameter **Noise level**
Client **Nick Skinner**
Sampling point **Aktobe, 41-site, house 34**
Date of measurements **27.09.2018**

Location of sampling point and time		t, ^{0}C	U, %	P, mm of m.c..	F, m/sec direction	Methods of testing ND	Standards	Received data, dBA
50°11’36.78”N 57°16’38.39”E	01:00	17	38	745.1	2 south-east	GOST 12.1.005-88 GOST 12.1.050-86 GOST 12.1.012-2004 GOST 12.4.012-83 GOST 12.1.036-81 GOST 12.1.049-86	45,0	44,0
	02:00	16	39	745.3	2 south-east			42,0
	03:00	16	40	745.3	2 south-east			38,0
	04:00	16	39	745.2	2 south, south-west			38,0
	05:00	15	35	745.0	2 south, south-west			39,0
	06:00	15	35	744.0	2 south			41,0
	07:00	15	37	744.3	2 south			43,0
	08:00	16	39	744.7	2 south		55,0	47,0
	09:00	15	43	744.5	3 north			49,0
	10:00	14	57	745.0	3 north			49,0
	11:00	13	82	745.2	3 north, north-west			50,0
	12:00	13	84	745.4	3 north, north-west			52,0
	13:00	13	87	745.6	3 north, north-west			52,0
	14:00	11	95	745.8	3 north, north-west			51,0
	15:00	11	96	744.2	2 north-west			50,0
	16:00	10	94	744.8	1 north-west			50,0
	17:00	10	92	745.6	1 north-west			51,0
	18:00	9	92	745.8	2 north-west			53,0
	19:00	9	91	745.2	2 north, north-west			53,0
	20:00	9	90	745.0	2 north, north-west			50,0
	21:00	8	90	744.3	2 north, north-west			48,0
	22:00	8	92	744.4	No wind			46,0
	23:00	7	94	744.6	No wind			45,0
	00:00	7	94	745.1	No wind		45,0	42,0

Executed: Engineer-environmentalist Urgenshpaev N.M.

Approved: Head of laboratory Bakytzhanova A.A.

APPENDIX H

CHANCE FIND PROCEDURE

Purpose of the chance find procedure
The chance find procedure is a project-specific procedure that outlines actions required if previously unknown heritage resources, particularly archaeological resources, are encountered during project construction or operation. A Chance Find Procedure, as described in IFC Performance Standard 8 is a process that prevents chance finds from being disturbed until an assessment by a competent specialist is made and actions consistent with the requirements are implemented.

Scope of the chance find procedure
This procedure is applicable to all activities conducted by the personnel, including contractors, that have the potential to uncover a heritage item/site. The procedure details the actions to be taken when a previously unidentified and potential heritage item/site is found during construction activities. Procedure outlines the roles and responsibilities and the response times required from both project staff, and any relevant heritage authority.

Induction/Training
All personnel, especially those working on earth movements and excavations, are to be inducted on the identification of potential heritage items/sites and the relevant actions for them with regards to this procedure during the Project induction and regular toolbox talks.

Chance find procedure
If any person discovers a physical cultural resource, such as (but not limited to) archaeological sites, historical sites, remains and objects, or a cemetery and/or individual graves during excavation or construction, the following steps shall be taken:

1. Stop all works in the vicinity of the find, until a solution is found for the preservation of these artefacts, or advice from the relevant authorities is obtained;
2. Immediately notify a foreman. The foreman will then notify the Construction Manager and the Environment Officer (EO)/Environmental Manager (EM);
3. Record details in Incident Report and take photos of the find;
4. Delineate the discovered site or area; secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities take over;
5. Preliminary evaluation of the findings by archaeologists. The archaeologist must make a rapid assessment of the site or find to determine its importance. Based on this assessment the appropriate strategy can be implemented. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage such as aesthetic, historic, scientific or research, social and economic values of the find;
6. Sites of minor significance (such as isolated or unclear features, and isolated finds) should be recorded immediately by the archaeologist, thus causing a minimum disruption to the work schedule of the Contractor. The results of all archaeological work must be reported to the Ministry/Agency, once completed.
7. In case of significant find the Agency/Ministry (Ministry of Culture and Sport) should be informed immediately and in writing within 7 days from the find.
8. The onsite archaeologist provides the Heritage team with photos, other information as relevant for identification and assessment of the significance of heritage items.
9. The Ministry must investigate the fact within 2 weeks from the date of notification and provide response in writing.
10. Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological importance) conservation, preservation, restoration and salvage;

11. Construction works could resume only after permission is granted from the responsible authorities.
12. In case no response received within the 2 weeks period mentioned above, this is considered as authorisation to proceed with suspended construction works.

One of the main requirements of the procedure is record keeping. All finds must be registered. Photolog, copies of communication with decision making authorities, conclusions and recommendations/guidance, implementation reports – kept.

Additional information
Management options for archaeological site

- **Site avoidance.** If the boundaries of the site have been delineated attempt must be made to redesign the proposed development to avoid the site. (The fastest and most cost-effective management option)
- **Mitigation.** If it is not feasible to avoid the site through redesign, it will be necessary to sample it using data collection program prior to its loss. This could include surface collection and/or excavation. (The most expensive and time-consuming management option.)
- **Site Protection.** It may be possible to protect the site through the installation of barriers during the time of the development and/or possibly for a longer term. This could include the erection of high visibility fencing around the site or covering the site area with a geotextile and then capping it with fill. The exact prescription would be site- specific.

Management of replicable and non-replicable heritage
Different approaches for the finds apply to replicable and non-replicable heritage.

Replicable heritage
Where tangible cultural heritage that is replicable[20] and not critical is encountered, mitigation measures will be applied.
The mitigation hierarchy is as follows:

- Avoidance;
- Minimization of adverse impacts and implementation of restoration measures, in situ;
- Restoration of the functionality of the cultural heritage, in a different location;
- Permanent removal of historical and archaeological artefacts and structures ;
- Compensation of loss - where minimization of adverse impacts and restoration not feasible.

Non-replicable heritage
Most cultural heritage is best protected by in situ preservation, since removal is likely to result in irreparable damage or even destruction of the cultural heritage.

Nonreplicable cultural heritage[21] must not be removed unless all of the following conditions are met:

- There are no technically or financially feasible alternatives to removal;
- The overall benefits of the project conclusively outweigh the anticipated cultural heritage loss from removal; and

[20] Replicable cultural heritage is defined as tangible forms of cultural heritage that can themselves be moved to another location or that can be replaced by a similar structure or natural features to which the cultural values can be transferred by appropriate measures. Archaeological or historical sites may be considered replicable where the particular eras and cultural values they represent are well represented by other sites and/or structures.

[21] Nonreplicable cultural heritage may relate to the social, economic, cultural, environmental, and climatic conditions of past peoples, their evolving ecologies, adaptive strategies, and early forms of environmental management, where the (i) cultural heritage is unique or relatively unique for the period it represents, or (ii) cultural heritage is unique or relatively unique in linking several periods in the same site. Examples of non-replicable cultural heritage may include an ancient city or temple, or a site unique in the period that it represents.

Any removal of cultural heritage must be conducted using the best available technique advised by relevant authority and supervised by archaeologist.

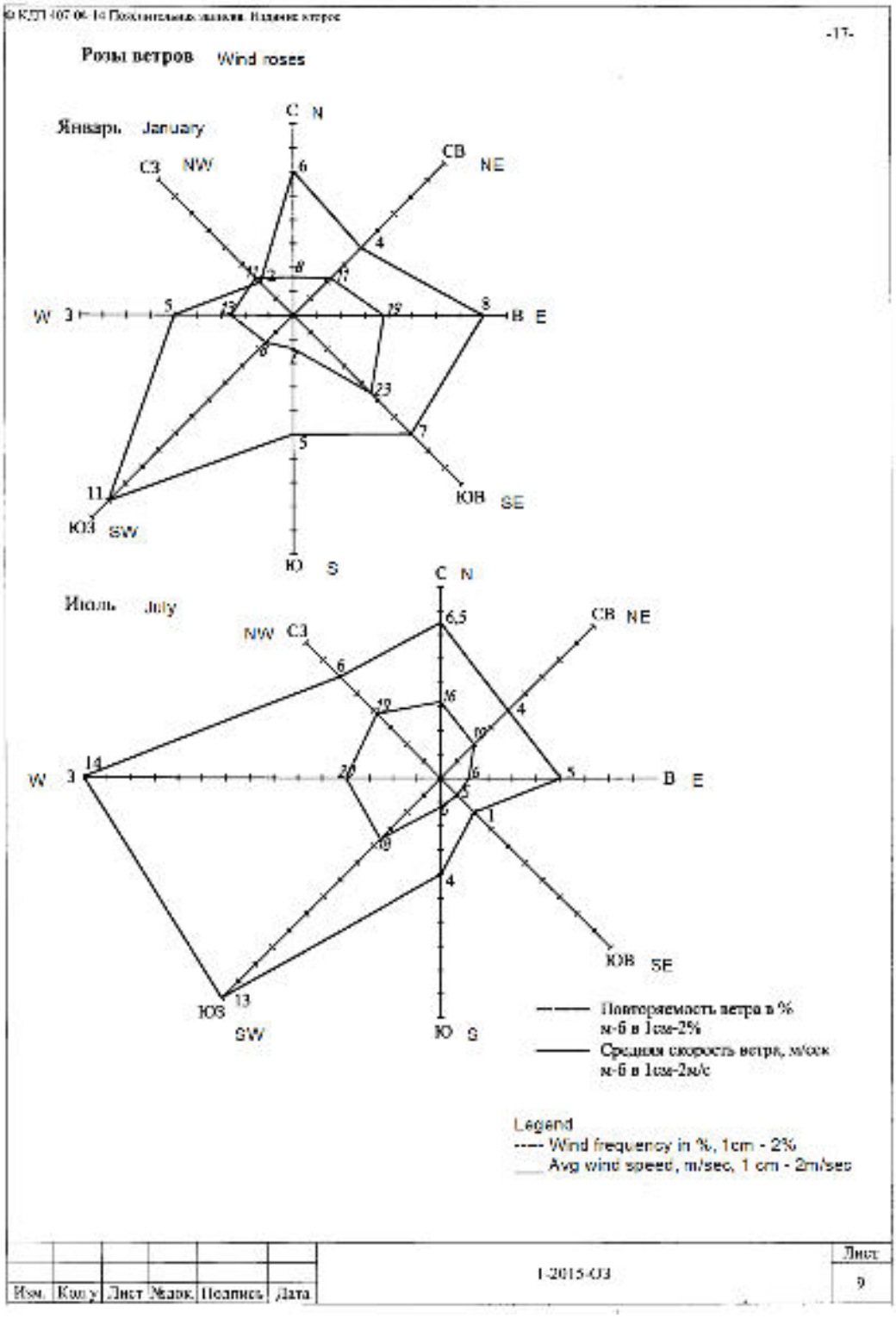
Human Remains Management Options
The handling of human remains believed to be archaeological in nature requires communication according to the same procedure described above.

There are two possible courses of action:

- **Avoid.** The development project is redesigned to completely avoid the found remains. An assessment should be made as to whether the remains may be affected by residual or accumulative impacts associated with the development, and properly addressed by a comprehensive management plan.
- **Exhumate.** Exhumation of the remains in a manner considered appropriate by decision makers. This will involve the predetermination of a site suitable for the reburial of the remains. Certain ceremonies or procedures may need to be followed before development activities can recommence in the area of the discovery.

APPENDIX I

AKTOBE WIND ROSE



APPENDIX J

CONSULTATION INFORMATION

Attachment 1. Announcement on public consultations in the local oblast newspaper (Aktobe Vestnik, N128, from 2 November 2018

Attachment 2. Minutes of public consultations in Aktobe (8 November 2018)

ПРОТОКОЛ

Проведения общественных слушаний

г. Актобе Актюбинской области

Дата проведения: 08 ноября 2018 год 09:00 часов.

Место проведения: Актовый зал средней школы № 71 г. Актобе Актюбинской области

Общественные слушания организованы Аппаратом акима г. Актобе Актюбинской области Республики Казахстан через СМИ (газета "Актюбинский вестник" № 128 от 02 ноября 2018 года), телеканал "Актобе-Казахстан", мессенджер "Whats App"

Участвовали: Жители г. Актобе Актюбинской области (Список прилагается)

Повестка дня:

Ознакомление населения с подробным проектом дороги с подходами АБР к принципам отчуждения собственности (земель), принятые для проекта, экологических вопросов и механизме рассмотрения жалоб.

Выступили:

1. Директор Актюбинского филиала АО НК "Казавтожол" Махамбетов М. поприветствовав всех присутствующих, представил сотрудника и консультантов АБР по социальным вопросам, охране окружающей среды и защитным мерам для проекта по улучшению автодороги «Актобе-Кандыагаш», представил присутствующим основные технические детали проекта, который прошел государственную экспертизу.

2. Международный консультант АБР по охране окружающей среде и защитным мерам Бабаджанова М. представила основные подходы АБР по природоохранным защитным мерам для проекта улучшения дороги «Актобе-Кандыагаш», и проинформировала, что целью проведения общественных слушаний является предоставление информации о политиках безопасности АБР, ознакомление местных жителей о проведенных дополнительных обследованиях, касающихся оценки воздействия Проекта по реконструкции дороги Актобе-Кандыагаш на окружающую среду и социальную сферу. Жители были проинформированы о разработанном Плане управления Окружающей Средой для всех этапов реализации Проекта, содержащем превентивные/смягчающие меры и программу мониторинга, а также обязанности вовлеченных сторон по его реализации.

3. Национальный консультант АБР по переселению и социальным защитным мерам Сердалиев К.С. представил основные принципы отчуждения собственности в соответствии с политиками безопасности АБР, принятые для проекта по реконструкции дороги «Актобе-Кандыагаш», а также детально разъяснил механизм рассмотрения жалоб, охватывающий как социальные, так и экологические вопросы

представил контактную информацию МРЖ. Выступление национального консультанта было проведено на казахском языке, с целью обеспечения полноценного понимания и вовлечения участников слушаний. Было отмечено, что детальная информация также приведена в информационных брошюрах, напечатанных на казахском и русском языках и розданных аудитории.

Кроме того, для наглядности и облегчения восприятия информации участниками слушаний, выступления консультантов сопровождались демонстрацией презентаций, подготовленных в Power Point.

После выступлений присутствующим была дана возможность задать вопросы и получить разъяснения на интересующие их темы касательно проектной дороги.

Были заданы следующие вопросы:

1. Кубенов А.И. - руководитель "Управления природных ресурсов и регулирования природопользования" акимата Актюбинской области

   Вопрос: Как будут проводиться платы за эмиссии по охране окружающей среде?

   Ответ: Проектом предусмотрена плата за эмиссию по охране окружающей среде в соответствии с местным законодательством.

2. Куанышева С.

   Вопрос: Будут ли привлекаться во время строительства на работу местное население и куда направлять свои резюме и т.д.?

   Ответ: Проектом предусмотрено трудоустройство местного населения во время строительства автомобильной дороги, свои вопросы или резюме можете направлять на электронные адреса или звонить по телефонам, указанным в информационных брошюрах.

3. Ибраев У.

   Вопрос: Когда планируется начало строительства автодороги "Актобе-Кандыагаш"?

   Ответ: Будет проводится тендер, предварительно планируется начать строительство в 2019 году. Срок строительства согласно проекта 36 месяцев.

4. Тажбаков Р.

   Вопрос: Были проблемы на других участках касательно выкупа и изъятия в Казахстане? Можете привести примеры?

   Ответ: АБР финансировал проект реконструкции автодороги в Жамбылской области, где вдоль старой автодороги на государственных земельных участках были расположены киоски (вагончики), которые торговали медом (медовики). Однако, после реконструкции автодороги, вдоль новой автодороги были с двух сторон поставлены барьерные ограждения и владельцы киосков (28 человек) не могли уже торговать вдоль новой автодороги. Далее, акимат района предоставил специально для них земельный участок возле площадки отдыха для продолжения бизнеса, т.е. для торговли медом и они в данное время продолжают свой бизнес торговли медом.

5. Кубенов А.И. - руководитель "Управления природных ресурсов и регулирования природопользования" акимата Актюбинской области

Вопрос: Будут ли Подрядчики платить за использование воды и карьеров в ходе строительства?

Ответ: Согласно национальному природоохранному законодательству и также требованиям АБР, Подрядчики должны получать соответствующие разрешения не только за использование водных ресурсов на технические нужды, использование карьеров, а также на выбросы в воздух и сбросы в почву. Кроме того, за использование природных ресурсов и сбросы/выбросы в окружающую среду, размещение отходов и т.п., Подрядчик будет платить в соответствии с имеющимися нормативами в стране.

Присутствующие отметили важность улучшения дороги для улучшения благосостояния населения, и повышения надежности и безопасности дорожного движения в Актюбинской области.

Председатель общественных слушаний:
Директор Актюбинского областного филиала
АО НК "Казавтожол" Махамбетов М.

М.П.

Секретарь общественных слушаний:
Начальник отдела Актюбинского областного филиала
АО НК "Казавтожол" Альжанов А.

List of participants of the public consultations in Aktobe (8 November 2018)

List of Participants of the Public Consultation for
CAREC Corridors 1 and 6 Connector Road (Aktobe-Kandyagash) Improvement Project

Список участников общественных слушаний по проекту
улучшения автомобильной дороги соединяющей коридоры 1 и 6 ЦАРЭС (Актобе-Кандыагаш)

ОАӘЫ 1 және 6 дәліздерін байланыстыратын автомобиль жолдарын жаңарту жобасы (Ақтөбе – Қандыағаш) жоспары бойынша қоғамдық тыңдаулардың қатысушыларының тізімі

8 November 2018 г., November __, 2018 г., __ ноября 2018 года. 8 караша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жұмыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс деректері (тел., эл. мекен-жайы)	Signature Подпись Қолы
1	Утешова Ж.У.	71 школа	87719680501	Утеш
2	Ахсова Д.К.	71 школа	3775806 2538	Д.Ахс
3	Бердалиева А.А.	71 школа	8775 125 1270	А.Бер
4	Исатаева С.Ә.	71 школа	8701 637 2326	Исат
5	Ваисова А.Г.	71 школа	8708-264-31-05	Ваис
6	Ерманова Г.С.	71 школа	3778 567-70-26	Ерма
7	Ушкова Г.И.	71 школа	8771 609 1491	Ушк
8	Уразбаева Ж.Т.	71 школа	8 771 [illegible] 452	Ураз
9	Досмагамбетова Ж.Т.	71 школа	8 709-139-08-05	Досм
10	Карамурзина Ж.С.	№71 мектеп	8705 495 8240	Кара

Актобе, November 8, 2018 Актобе, __ ноября 2018 года, Актобе 8, __ караша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жумыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс акпарат (тел., эл. мекен-жайы)	Signature Подпись Колы
11	Юрьев Ю.Ю. (м)	ТОО "Строй деталь"	8 705 730 95 49	[signature]
12	Досмухамбетов Ж.И. (м)	ТОО "Строй деталь"	8 777 362 79 39	[signature]
13	Омар Ж.К. (ж)	71 школа	8 707 933 90 25	[signature]
14	[illegible] Б.К.	71 школа	8 771 545 99 41	[signature]
15	[illegible] Г.Ж.	№71 мектеп	87078742970	[signature]
16	[illegible] Н.А.	№71 мектеп	87785138369	[signature]
17	[illegible] С.Е.	№71 мектеп	87718202799	[signature]
18	[illegible] Н.Н.	№71 мектеп	8776874 9588	[signature]
19	[illegible] С.А.	№71 мектеп	87767541150	[signature]
20	[illegible] Ю.А.	№71 мектеп	8776-738-55-65	[signature]

Актобе 8, November __, 2018 Актобе 8, __ ноября 2018 года, Актобе, 8 караша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жумыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс акпарат (тел., эл. мекен-жайы)	Signature Подпись Колы
21	Тажинов Р.С.	КазАвтоЖол	8777 871 88 45	[signature]
22	Туриманова А.Б.	КазАвтоЖол	87770800534	[signature]
23	Калагаров Е.С.	Каз Автожол	8702 559 32 70	[signature]
24	Baladzhanova Malika	ADB Regional Environmental Consultant	+998918420944	[signature]
25	Aida Bekzhanova	ADB	+639999991477	[signature]
26	Махамбетов М.С.	КазАвтоЖол	8 771 566 31 44	[signature]
27	Кубенов А.И.	[illegible]	8 701 511 4664	[signature]
28	Серралиев К.С.	ADB	8705 722 70 44	[signature]
29	Абенов З.	ADB	—	[signature]
30	Алтенов А.Е.	[illegible] КАЗН.	8701 624 25 84	[signature]

Attachment 3. Minutes of public consultations in Bestamak (8 November 2018)

ПРОТОКОЛ

Проведения общественных слушаний

с. Бестамак Бестамакского сельского округа Алгинского района Актюбинской области

Дата проведения: 08 ноября 2018 год 15:00 часов.

Место проведения: Зал Дома культуры с. Бестамак Бестамакского сельского округа Алгинского района Актюбинской области

Общественные слушания организованы Аппаратом акима Алгинского района Актюбинской области Республики Казахстан через СМИ (газета "Актобинский вестник" № 128 от 02 ноября 2018 года), телеканал "Актобе-Казахстан", мессенджер "Whats App"

Участвовали: Жители с. Бестамак Алгинского района Актюбинской области (Список прилагается)

Повестка дня:

Ознакомление населения с подробным проектом дороги с подходами АБР к принципам отчуждения собственности (земель), принятые для проекта, экологических вопросов и механизме рассмотрения жалоб.

Выступили:

1. Представитель местных исполнительных органов, аким Алгинского района Актюбинской области Алдияров Н.С. поприветствовав всех присутствующих, представил жителям с. Бестамак представителей Актюбинского филиала АО «НК Казавтожол», Актюбинского филиала ТОО "Казахавтодор" и сотрудника и консультантов АБР по социальным вопросам, охране окружающей среды и защитным мерам для проекта по улучшению автодороги «Актобе-Кандыагаш»

2. Директор Актюбинского филиала АО НК "Казавтожол" Махамбетов М. поприветствовав всех присутствующих, предетавил присутствующим основные технические детали проекта, который прошел государственную экспертизу.

3. Международный консультант АБР по охране окружающей среде и защитным мерам Бабаджанова М. представила основные подходы АБР по природоохранным защитным мерам для проекта улучшения дороги «Актобе-Кандыагаш», и проинформировала, что целью проведения общественных слушаний является предоставление информации о политиках безопасности АБР, ознакомление местных жителей о проведенных дополнительных обследованиях, касающихся оценки воздействия Проекта по реконструкции дороги Актобе-Кандыагаш на окружающую среду и социальную сферу. Жители были проинформированы о разработанном Плане управления Окружающей Средой для всех этапов реализации Проекта, содержащем превентивные/смягчающие меры и программу мониторинга, а также обязанности вовлеченных сторон по его реализации.

4. Национальный консультант АБР по переселению и социальным защитным мерам Сердалиев К.С. представил основные принципы отчуждения собственности в соответствии с политиками безопасности АБР, принятые для проекта по реконструкции дороги «Актобе-Кандыагаш», а также детально разъяснил механизм рассмотрения жалоб, охватывающий как социальные, так и экологические вопросы представил контактную информацию МРЖ. Выступление национального консультанта было проведено на казахском языке, с целью обеспечения полноценного понимания и вовлечения участников слушаний. Было отмечено, что детальная информация также приведена в информационных брошюрах, напечатанных на казахском и русском языках и розданных аудитории.

Кроме того, для наглядности и облегчения восприятия информации участниками слушаний, выступления консультантов сопровождались демонстрацией презентаций, подготовленных в Power Point.

После выступлений присутствующим была дана возможность задать вопросы и получить разъяснения на интересующие их темы касательно проектной дороги.

Были заданы следующие вопросы:

1. Тулегенов К.

   Вопрос: Расстояние от опоры освещения до границы тротуара?

   Ответ: Проектом предусматривает расстояние опоры освещения до границы тротуара 710 см.

2. Шынтасов М. - пенсионер

   Население Алгинского района, в т.ч. с. Бестамак полностью поддерживает строительство автодороги "Актобе-Кандыагаш" и данный проект автодороги.

3. Алмашев Т. - пенсионер

   Вопрос: Может ли проехать трактор с сеном к моему дому?

   Ответ: Проектом предусмотрен местный проезд (автодорога) в с. Бестамак шириной 4,5 метра и тротуар шириной 1,5 метра.

4. Есбергенов Т. - пенсионер

   Когда планируется начало строительства автодороги "Актобе-Кандыагаш"?

   Ответ: Будет проводится тендер, предварительно планируется начать строительство в 2019 году.

Присутствующие отметили важность улучшения дороги для улучшени благосостояния населения, и повышения надежности и безопасности дорожного движени в Актюбинской области.

Председатель общественных слушаний:
Аким Алгинского района Актюбинской области
Алдияров Н.С.

М.П

Секретарь общественных слушаний:
помощник акима Алгинского района Актюбинской области
Сурбаев А.И.

List of participants of the public consultations in Bestamak village (8 November 2018)

List of Participants of the Public Consultation for
CAREC Corridors 1 and 6 Connector Road (Aktobe-Kandyagash) Improvement Project

Список участников общественных слушаний по проекту
улучшения автомобильной дороги соединяющей коридоры 1 и 6 ЦАРЭС (Актобе-Кандыагаш)

ОАА3Ы 1 және 6 дәліздерін байланыстыратын автомобиль жолдарын жаңарту жобасы (Ақтөбе – Қандыағаш) жоспары бойынша қоғамдық тыңдаудың қатысушылардың тізімі

Bestamak, November 8, 2018 Бестамак, 8 ноября 2018 года, Бестамак, 08 қараша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жұмыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс ақпарат (тел., эл. мекен-жайы)	Signature Подпись Қолы
1	Тулеленов Ж. Е. (м)	пенсионер	8 777 156 50 71	
2	Шинтасов М. Ж. (м)	пенсионер	8 705 944 47 76	
3	[illegible] Ж. Е. (ж)	[illegible]	[illegible]	
4	Жумина Ж. С. (ж)	«Бестамак» балалар бақшасы	8 777 354 27 15	
5	[illegible] А. И. (ж)	«Бестамак» балалар бақшасы	8-777-581-28-15	
6	Наукенова А. Н. (ж)	«Бестамак» балалар бақшасы	8775 685 4913	
7	[illegible] (ж)	«Бестамак» балалар бақшасы	[illegible]	
8	Курманова [illegible] (ж)	[illegible]	87021036097	
9	[illegible] Б. О. (ж)	«Бестамак» балалар бақшасы	[illegible]	
10	[illegible] (м)	[illegible]	8705 530 05 47	

Bestamak, November 8, 2018 Бестамак, 8 ноября 2018 года. Бестамак, 8 қараша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жұмыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс ақпарат (тел., эл. жекен-жайы)	Signature Подпись Қолы
11	Маханова Маргабат (...)	Бестамак, [illegible]	8-705-579-37-94	
12	[illegible] (...)	Бест орта мектебі	8 747 416 53 59	
13	[illegible]	мектеп	8 705 565 58 96	
14	[illegible]	БОМ	87716114334	
15	[illegible]	Б.О.М.	87025731864	
16	[illegible]	Б.О.М	87711573805	
17	[illegible]	БОМ	87029300280	
18	[illegible]	БОМ	87058387218	
19	[illegible] З. А	БОМ	87715185868	
20	Балмагамбет С.С	БОМ	87014545445	

Bestamak 8, November __, 2018 Бестамак, 8 ноября 2018 года, Бестамак, 8 қараша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жұмыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс ақпарат (тел., эл. жекен-жайы)	Signature Подпись Қолы
22	[illegible] Б.К	пенсионер		
23	[illegible]	-"-		
24	[illegible] С	-"-		
25	[illegible]	-"-		
26	[illegible]	-"-		
27	[illegible]	-"-		
28	[illegible]	-"-		
29	Искендиров С	-"-		
30	[illegible] Б.Б.	-"-		

Bestamak, November 8, 2018 Бестамак, 8 ноября 2018 года, Бестамак, 08 караша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жумыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс акпарат (тел. эл. мекен-жайы)	Signature Подпись Колы
31	[illegible]	[illegible]	87715993049 [illegible] 16-1	[signature]
32	Кусаинов Касен [illegible]	Пенсионер	Бокенбай батыра 13 тел. 35-254	[signature]
33	Кусаинов Амангельды [illegible]	Пенсионер	тел. 35-214 Бокенбай батыра 4а	[signature]
34	Коныбаев [illegible]	Пенсионер	Бокенбай батыра 32	[signature]
35	Жамангараев [illegible]	Пенсионер	Бокенбай батыра 36	[signature]
36	Джусупов [illegible]	Пенсионер	Арынская №9	[signature]
37	Нуртаев [illegible]	пенсионер	Алинина 74/1	[signature]
38	Кожмагамбетов [illegible]	пенсионер	Бокенбай батыр, 73	[signature]
39	Оразалиев [illegible]	пенсионер	[illegible], 15	[signature]
40	[illegible]	пенсионер	Бокенбай. б/ф 63/3	[signature]

Bestamak, November 8, 2018 Бестамак, 8 ноября 2018 года, Бестамак, 8 караша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жумыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс акпарат (тел. эл. мекен-жайы)	Signature Подпись Колы
41	Бекетаева [illegible]	Бестамак ОШ	8-741-[illegible]-05	[signature]
42	Калиакаева [illegible]	Бестамак ОШ	8-705-[illegible]	[signature]
43	[illegible]	[illegible]	8-701-[illegible]	[signature]
44	[illegible]	[illegible]	8705 4763435	[signature]
45	[illegible]	[illegible]	8705 493 65 09	[signature]
46	[illegible]	[illegible]	[illegible]	[signature]
47	[illegible]	[illegible]	8-777-[illegible]-06-36	[signature]
48	[illegible]	[illegible]	8-777-[illegible]	[signature]
49	[illegible]	Бестамак ОШ	8705 235 00 86	[signature]
50	[illegible]	Бестамак ОШ	8708 472 9187	[signature]

Bestamak, November __, 2018 Бестамак, 8 ноября 2018 года, Бестамак, 08 караша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жумыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс акпарат (тел. эл. мекен-жайы)	Signature Подпись Колы
51	[illegible]	ADB Environmental Consultant	+[illegible]	[signature]
52	Aida [illegible]	ADB	+63 9999991497	[signature]
53	Zareh Hayrapetyan	ADB consultant	[illegible]	[signature]
54	[illegible]	КазАвтоЖол	8 701 [illegible] 25 84	[signature]
55	УТЕМУРАТОВ АКИМЖАН [illegible]	ТОО КАЗАХАВТОДОР	8-777-714-3333	[signature]
56	[illegible]	[illegible]	8705 630 00 97	[signature]
57	[illegible] К.	ADB	8705720[illegible]	[signature]
58	[illegible] К.	[illegible]		[signature]
59	[illegible]	[illegible]	8725 6 85 5837	[signature]

Attachment 4. Minutes of public consultations in Alga (9 November 2018)

ПРОТОКОЛ

Проведения общественных слушаний

г. Алга Алгинского района Актюбинской области

Дата проведения: 09 ноября 2018 год 10:00 часов.

Место проведения: Актовый зал средней школы №2 Алгинского района Актюбинской области

Общественные слушания организованы Аппаратом акима Алгинского района Актюбинской области Республики Казахстан через СМИ (газета "Актюбинский вестник" № 128 от 02 ноября 2018 года), телеканал "Актобе-Казахстан", мессенджер "Whats App"

Участвовали: Жители г. Алга Алгинского района Актюбинской области (Список прилагается)

Повестка дня:

Ознакомление населения с подробным проектом дороги с подходами АБР к принципам отчуждения собственности (земель), принятые для проекта, экологических вопросов и механизме рассмотрения жалоб.

Выступили:

1. Представитель местных исполнительных органов, заместитель акима Алгинского района Актюбинской области Кадырбергенов Р.С. поприветствовав всех присутствующих, представил жителям г. Алга представителей Актюбинского филиала АО «НК Казавтожол», сотрудника и консультантов АБР по социальным вопросам, охране окружающей среды и защитным мерам для проекта по улучшению автодороги «Актобе-Кандыагаш»

2. Директор Актюбинского филиала АО НК "Казавтожол" Махамбетов М. поприветствовав всех присутствующих, представил присутствующим основные технические детали проекта, который прошел государственную экспертизу.

3. Международный консультант АБР по охране окружающей среде и защитным мерам Бабаджанова М. представила основные подходы АБР по природоохранным защитным мерам для проекта улучшения дороги «Актобе-Кандыагаш», и проинформировала, что целью проведения общественных слушаний является предоставление информации о политиках безопасности АБР, ознакомление местных жителей о проведенных дополнительных обследованиях, касающихся оценки воздействия Проекта по реконструкции дороги Актобе-Кандыагаш на окружающую среду и социальную сферу. Жители были проинформированы о разработанном Плане управления Окружающей Средой для всех этапов реализации Проекта, содержащем превентивные/смягчающие меры и программу мониторинга, а также обязанности вовлеченных сторон по его реализации.

4. Национальный консультант АБР по переселению и социальным защитным мерам Сердалиев К.С. представил основные принципы отчуждения собственности в соответствии с политиками безопасности АБР, принятые для проекта по реконструкции дороги «Актобе-Кандыагаш», а также детально разъяснил механизм рассмотрения жалоб, охватывающий как социальные, так и экологические вопросы представил контактную информацию МРЖ. Выступление национального консультанта было проведено на казахском языке, с целью обеспечения полноценного понимания и вовлечения участников слушаний. Было отмечено, что детальная информация также приведена в информационных брошюрах, напечатанных на казахском и русском языках и розданных аудитории.

После выступлений присутствующим была дана возможность задать вопросы и получить разъяснения на интересующие их темы касательно проектной дороги.

Были заданы следующие вопросы:

1. Конжарулы Ж. - председатель совета ветеранов

Вопрос: Почему автодорога не проходит по существующей трассе, в частности через г. Алга.

Ответ: Проект предусматривает обходы городов, в т.ч. Алга и Кандыагаш в целях безопасности движения и населения. Также старая автодорога пройдет ремонт и будет сдан в автодорогу местного (областного) значения.

2. Муханова С.А. - бухгалтер

Вопрос: У меня имеется дача в Алгинском районе. Будет ли изыматься для строительства автодороги мой земельный участок с недвижимым имуществом.

Ответ: Согласно проекта автодороги и землеустроительного проекта в зону воздействия автодороги попадают только государственные земельные участки, кроме трех магазинов в с. Бестамак. В случае попадания в зону воздействия проекта выйдет соответствующее постановление акима Алгинского района об изъятии земельного участка и вам будет предложены либо альтернативный земельный участок или денежная компенсация. По всем интересующим вопросам можете обратиться через контактные данные, которые имеются в информационных брошюрах, розданных Вам.

3. Жумабаев Б. - секретарь Алгинского районного маслихата

Население Алгинского района полностью поддерживает строительство автодороги "Актобе-Кандыагаш" и данный проект автодороги.

4. Кашкинбаев Ж. - пенсионер

Когда планируется начало строительства автодороги "Актобе-Кандыагаш"?

Ответ: Будет проводится тендер, предварительно планируется начать строительство в 2019 году.

Присутствующие отметили важность улучшения дороги для улучшения благосостояния населения, и повышения надежности и безопасности дорожного движения в Актюбинской области.

Председатель общественных слушаний:
Заместитель акима Алгинского района Актюбинской области
Кадырбергенов Р.С.

М.П

Секретарь общественных слушаний:
помощник акима Алгинского района Актюбинской области
Сурбаев А.И

List of participants of public consultations in Alga (9 November 2018)

List of Participants of the Public Consultation for CAREC Corridors 1 and 6 Connector Road (Aktobe-Kandyagash) Improvement Project

Список участников общественных слушаний по проекту улучшения автомобильной дороги соединяющей коридоры 1 и 6 ЦАРЭС (Актобе-Кандыагаш)

ОАА ЭЫ 1 және 6 дәліздерін байланыстыратын автомобиль жолдарын жаңарту жобасы (Ақтөбе – Қандыағаш) жоспары бойынша қоғамдық тыңдаудың қатысушылардың тізімі

[illegible], November 9, 2018 [illegible], 9 ноября 2018 года, [illegible], 9 қараша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жұмыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс ақпарат (тел., эл. мекенжайы)	Signature Подпись Қолы
1	[illegible]	№2 Алга ОШ	4-35-31	[signature]
2	[illegible]	№2 Алга ОШ	4-39-31	[signature]
3	[illegible]	№2 Алга ОШ	4-39-31	[signature]
4	[illegible]	Отдел финансов	87024320498	[signature]
5	Жусаинова Зухра	№2 Алга ОШ	8701-190-80-72	[signature]
6	Нурханов Сабит	№2 Алга О.Ш	8771 184 11-42	[signature]
7	Исабеков [illegible]	№2 ~~Алга~~ О.Ш	8705 597 90 60	[signature]
8	[illegible]	№2 Алга О.Ш	87053799207	[signature]
9	[illegible]	№2 Алга ОШ	87056059004	[signature]
10	Бекім [illegible]	ГУ, Алгинский РО земельных отношений	87053813847	[signature]

List of Participants of the Public Consultation for CAREC Corridors 1 and 6 Connector Road (Aktobe-Kandyagash) Improvement Project

Список участников общественных слушаний по проекту улучшения автомобильной дороги соединяющей коридоры 1 и 6 ЦАРЭС (Актобе-Кандыагаш)

ОААЭЫ 1 және 6 дәліздерін байланыстыратын автомобиль жолдарын жаңарту жобасы (Ақтөбе – Қандыағаш) жоспары бойынша қоғамдық тыңдаудың қатысушылардың тізімі

Алға, November 9, 2018 Алға, 9 ноября 2018 года, Алға, 9 караша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жұмыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс ақпарат (тел., эл. мекен-жайы)	Signature Подпись Қолы
11	Джантасов Н.А	"Нұр Отан"	8 71332 43736	
12	Кожнарчев Ж.	Архитектор ...	87761091948	
13	Тулегенов Б.М	Қоғамдық кеңес	87054751279	
14	Кайшиуров Ж	Зейнеткер	87051781556	
15	Қашинбаев Ж	Зейнеткер	87053577146	
16	Картбаев Б.П	Зейнеткер	87712914318	
17	Сатарова Э.Р	мұғалімі №2 Алға ОШ	87029432543	
18	Галиева А	№2 Алға ОШ	87711873389	

Алға, November 9, 2018 Алға, 9 ноября 2018 года, Алға, 9 караша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жұмыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс ақпарат (тел., эл. мекен-жайы)	Signature Подпись Қолы
19	Кашимова Н.Г	Районо бухгалтерия	4-37-35	
20	Мусанова С.А	Районо бух	4-37-35	
21	Шынжанова Г.Н	Районо бух	4-37-35	
22	Балтагулова С.А	Районо бух	43735	
23	Оспан А.К	мұғалімі №2 ОШ		
24	Ахмедова Н.Ж	№2 ОШ мұғалімі		
25	Кулбаева А.Е	№2 Алға ОШ		
26	Мырзатова Б.Е	№2 Алға ОШ мұғ		
27	Шамбаева Г.С	№2 Алға ОШ мұғалімі		
28	Чекрас Т.А	№2 Алға ОШ [illegible]		

Aktobe, November 9, 2018   Актобе, 9 ноября 2018 года,   Ақтөбе, 9 қараша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жумыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс акпарат (тел., эл. мекен-жайы)	Signature Подпись Қолы
29	Мухамбеталина Г. Ж.	Шаруашылық [illegible] Жұртшы [illegible]	8 777 142 22 79	
30	[illegible] К. А.	Жұр [illegible] ш.о	8 777 267 5681	
31	[illegible] С. Е.	[illegible] ш.о	8 771 295 02 76	
32	[illegible] Г. Ж.	[illegible] ш.о	8 705 145 6889	
33	[illegible] Р. З.	[illegible]	8 701 625 62 98	
34	[illegible] К. С.	«Жұр [illegible]»	8 705 383 66 84	
35	Фиценко И. П.	сш № 2 г. Акт	8 777 239 26 79	
36	[illegible] Р. З.	сш № 2 г. Акт	8 705 475 43 28	
37	Самарская В. Р.	сш № 2 г. Акт	8 775 563 82 75	
38	[illegible] Т. А.	сш № 2 г. Акт	8 777 120 23 59	

Aktobe, November 9, 2018   Актобе, 9 ноября 2018 года,   Ақтөбе, 9 қараша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жумыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс акпарат (тел., эл. мекен-жайы)	Signature Подпись Қолы
39	Babadzhanova Malika	ADB env. consultant	+[illegible]	
40	Zarina Kazybayeva	ADB consultant	[illegible] consultant@adb.org	
41	Aida Sadykbekova	ADB	+63 999 999 1477	
42	Кадырбеков Расул	Аким	8 775 312 13 01	
43	[illegible]	[illegible] района		
44	[illegible] Салимжанов [illegible]	[illegible]	8 776 566 31 44	

Attachment 5. Minutes of public consultations in Kandyagash (9 November 2018)

ПРОТОКОЛ

Проведения общественных слушаний

г. Кандыагаш Мугалжарского района Актюбинской области

Дата проведения: 09 ноября 2018 год 16:00 часов.

Место проведения: Актовый зал здания НГДУ г. Кандыагаш Мугалжарского района Актюбинской области

Общественные слушания организованы Аппаратом акима Мугалжарского района Актюбинской области Республики Казахстан через СМИ (газета "Актюбинский вестник" № 128 от 02 ноября 2018 года), телеканал "Актобе-Казахстан", мессенджер "Whats App"

Участвовали: Жители Мугалжарского района Актюбинской области (Список прилагается)

Повестка дня:

Ознакомление населения с подробным проектом дороги с подходами АБР к принципам отчуждения собственности (земель), принятые для проекта, экологических вопросов и механизме рассмотрения жалоб.

Выступили:

1. Представитель местных исполнительных органов, заместитель акима Мугалжарского района Актюбинской области Кулмаганбетов Б.К. поприветствовав всех присутствующих, представил жителям г. Кандыагаш, представителей Актюбинского филиала АО «НК Казавтожол», сотрудника и консультантов АБР по социальным вопросам, охране окружающей среды и защитным мерам для проекта по улучшению автодороги «Актобе-Кандыагаш»

2. Директор Актюбинского филиала АО НК "Казавтожол" Махамбетов М. представил присутствующим основные технические детали проекта, который прошел государственную экспертизу.

3. Международный консультант АБР по охране окружающей среде и защитным мерам Бабаджанова М. представила основные подходы АБР по природоохранным защитным мерам для проекта улучшения дороги «Актобе-Кандыагаш», и проинформировала, что целью проведения общественных слушаний является предоставление информации о политиках безопасности АБР, ознакомление местных жителей о проведенных дополнительных обследованиях, касающихся оценки воздействия Проекта по реконструкции дороги Актобе-Кандыагаш на окружающую среду и социальную сферу. Жители были проинформированы о разработанном Плане управления Окружающей Средой для всех этапов реализации Проекта, содержащем превентивные/смягчающие меры и программу мониторинга, а также обязанности вовлеченных сторон по его реализации.

4. Национальный консультант АБР по переселению и социальным защитным мерам Сердалиев К.С. представил основные принципы отчуждения собственности в соответствии с политиками безопасности АБР, принятые для проекта по реконструкции дороги «Актобе-Кандыагаш», а также детально разъяснил механизм рассмотрения жалоб, охватывающий как социальные, так и экологические вопросы представил контактную информацию МРЖ. Выступление национального консультанта было проведено на казахском языке, с целью обеспечения полноценного понимания и вовлечения участников слушаний. Было отмечено, что детальная информация также приведена в информационных брошюрах, напечатанных на казахском и русском языках и розданных аудитории.

После выступлений присутствующим была дана возможность задать вопросы и получить разъяснения на интересующие их темы касательно проектной дороги.

Были заданы следующие вопросы:

1. Кулмаганбетов Б.К. - заместитель акима Мугалжарского района Актюбинской области

   Вопрос: Новая автодорога будет обходит г. Кандыагаш. Что будет со старой автодорогой?

   Ответ: Проект предусматривает обходы городов, в т.ч. Алга и Кандыагаш в целях безопасности движения и населения. Старую автодорогу отремонтируют и затем она будет сдана в автодорогу местных исполнительных органов.

2. Сареенова С.

   Вопрос: Когда планируется начало строительства автодороги "Актобе-Кандыагаш"?

   Ответ: Будет проводится тендер, предварительно планируется начать строительство в 2019 году.

   Несколько участниц слушаний отметили, что часто ездят в г. Актобе и много тратят денежных средств для ремонта своего транспорта из-за плохого состояния существующей автодороги.

Присутствующие отметили важность улучшения автодороги для улучшения благосостояния населения, и повышения надежности и безопасности дорожного движения в Актюбинской области.

Председатель общественных слушаний:

Заместитель акима Мугалжарского района Актюбинской области
Кулмаганбетов Б.К.

М.П

Секретарь общественных слушаний:
руководитель отдела организационно-правовых работ аппарата акима
Мугалжарского района Актюбинской области Емжарова С.

List of participants of the public consultations in Kandyagash (9 November 2018)

List of Participants of the Public Consultation for
CAREC Corridors 1 and 6 Connector Road (Aktobe-Kandyagash) Improvement Project

Список участников общественных слушаний по проекту
улучшения автомобильной дороги соединяющей коридоры 1 и 6 ЦАРЭС (Актобе-Кандыагаш)

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Kandyagash, November 9, 2018 Кандыагаш, 9 ноября 2018 года, Қандыағаш, 9 қараша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жұмыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс ақпарат (тел., эл. мекен-жайы)	Signature Подпись Қолы
1	[illegible] Е.С. ж	РайОО	3-18-46	
2	Куршамшина С.Б. ж	РайОО	3-18-45	
3	Мукашева А.О. ж	Райотдел Эк СП	3-98-93	
4	[illegible] ж	РайОЗ и СП	3-18-42	
5	[illegible] ж	РайОЗ и СП	3-41-47	
6	[illegible] ж	[illegible]	3-51-37	
7	Днуржанова [illegible] ж	[illegible]	3-18-33	
8	Жумахметова [illegible] ж	ЗАГС	3-13-99	
9	[illegible] ж	РайОО [illegible]	3-11-41	
10	[illegible] ж	РайОО [illegible]	3-29-11	

Kandyagash, November 9, 2018 Кандыагаш, 9 ноября 2018 года, Қандыағаш, 9 қараша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жұмыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс ақпарат (тел., эл. мекен-жайы)	Signature Подпись Қолы
11	Мамыева Э.Ш. ж	РайОО	87057206485	
12	[illegible] Б.К. ж	РайОО	87771850109	
13	[illegible] Ш.Ш. ж	РайОО	87016373954	
14	[illegible] Г.А. ж	РайОО	8775-601-83-08	
15	Маженова А.Ш. ж	РайОО	8775 498 45 53	
16	Муранова А.Д. ж	РайОО	8747 404 1480	
17	[illegible] ж	РайОО	87756197303	
18	М.А. Ахметов ж	РайОО	87775597575	
19	Жумабекова Ш.А. ж	РайОО	87021433506	
20	[illegible] К.Ш. м	Жұмыс жоқ	8775 305 0709	

Kandyagash, November 9, 2018 Кандыагаш, 9 ноября 2018 года, Кандыагаш, 9 қараша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.		Occupation Место работы Жұмыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс ақпарат (тел., эл. пошта-жайы)	Signature Подпись Қолы
21	Балташев Нурлан	ж	[illegible]	87759316649	[signature]
22	Мухамедова [illegible]	ж	[illegible]	—	[signature]
23	[illegible]	ж	[illegible]	—	[signature]
24	[illegible]	ж	[illegible]	[illegible]	[signature]
25	[illegible]	ж	[illegible]	8702 [illegible]	[signature]
26	[illegible] М. М.	ж	[illegible]	8705 537-31-31	[signature]
27	[illegible] Т. К.	ж	[illegible]	8701-265-12-83	[signature]
28	[illegible] А. М.	ж	[illegible]	5-08-04	[signature]
29	[illegible] М. С.	ж	[illegible] Кандыагаш	[illegible]	[signature]
30	[illegible] Ш. К.	ж	[illegible]	8-701-719-80-67	[signature]

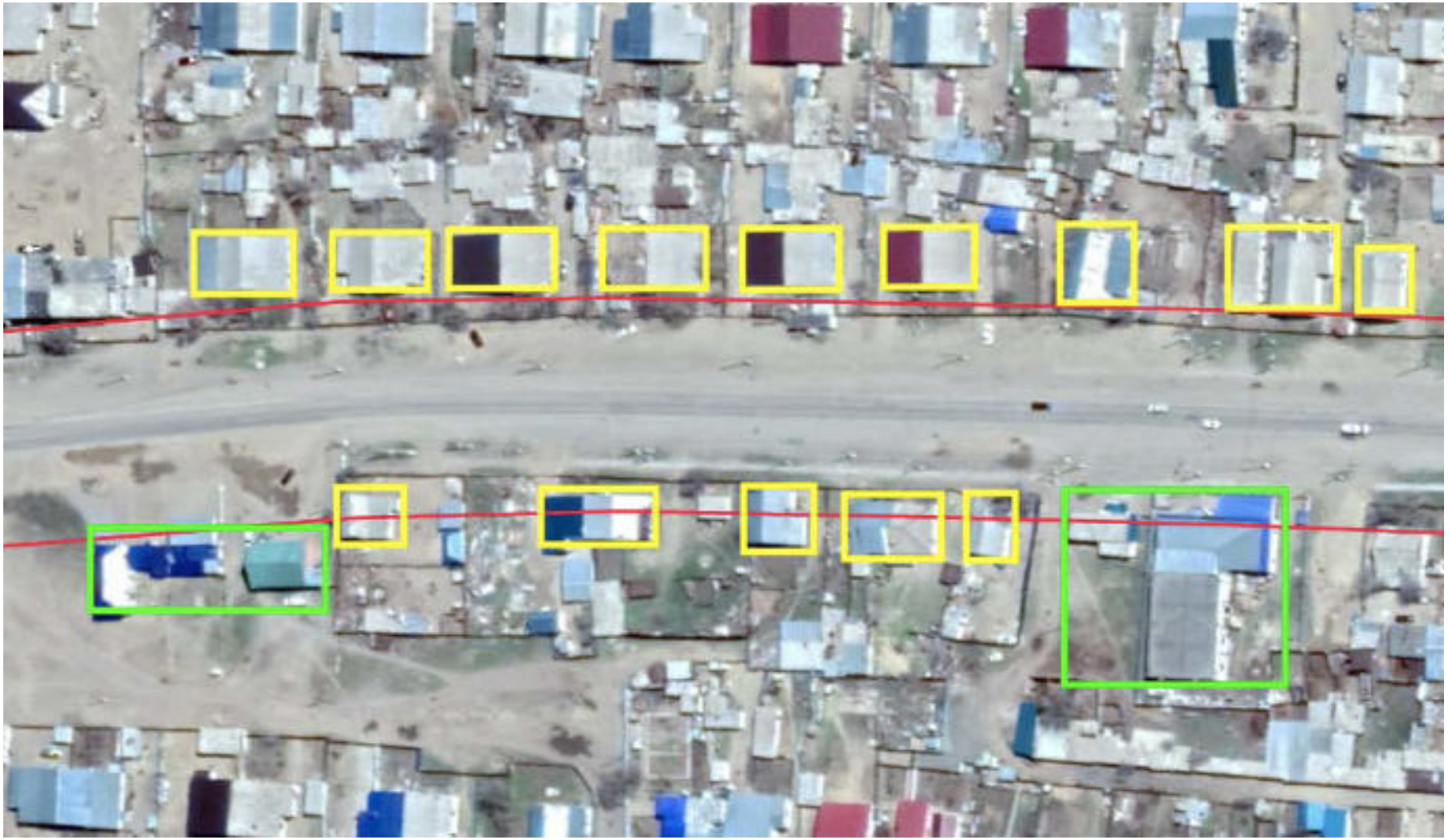
Kandyagash, November 9, 2018 Кандыагаш, 9 ноября 2018 года, Кандыагаш, 9 қараша 2018 ж.

№	Name, Surname Ф. И.О. А.Т.Ж.	Occupation Место работы Жұмыс орны	Contact details (phone, e-mail) Контактные данные (тел. эл. адрес) Байланыс ақпарат (тел., эл. пошта-жайы)	Signature Подпись Қолы
31	[illegible]	[illegible] Кандыагаш	3-68-68	[signature]
32	[illegible] К. С.	АДВ	8[illegible]	[signature]
33	[illegible]	АДВ	[illegible]	[signature]
34	[illegible]	Каз Авто Жол	8701 [illegible] 25 [illegible]	[signature]
35	[illegible]	Каз Авто Жол	87745663144	[signature]
36	[illegible] Кандыагаш			

APPENDIX K

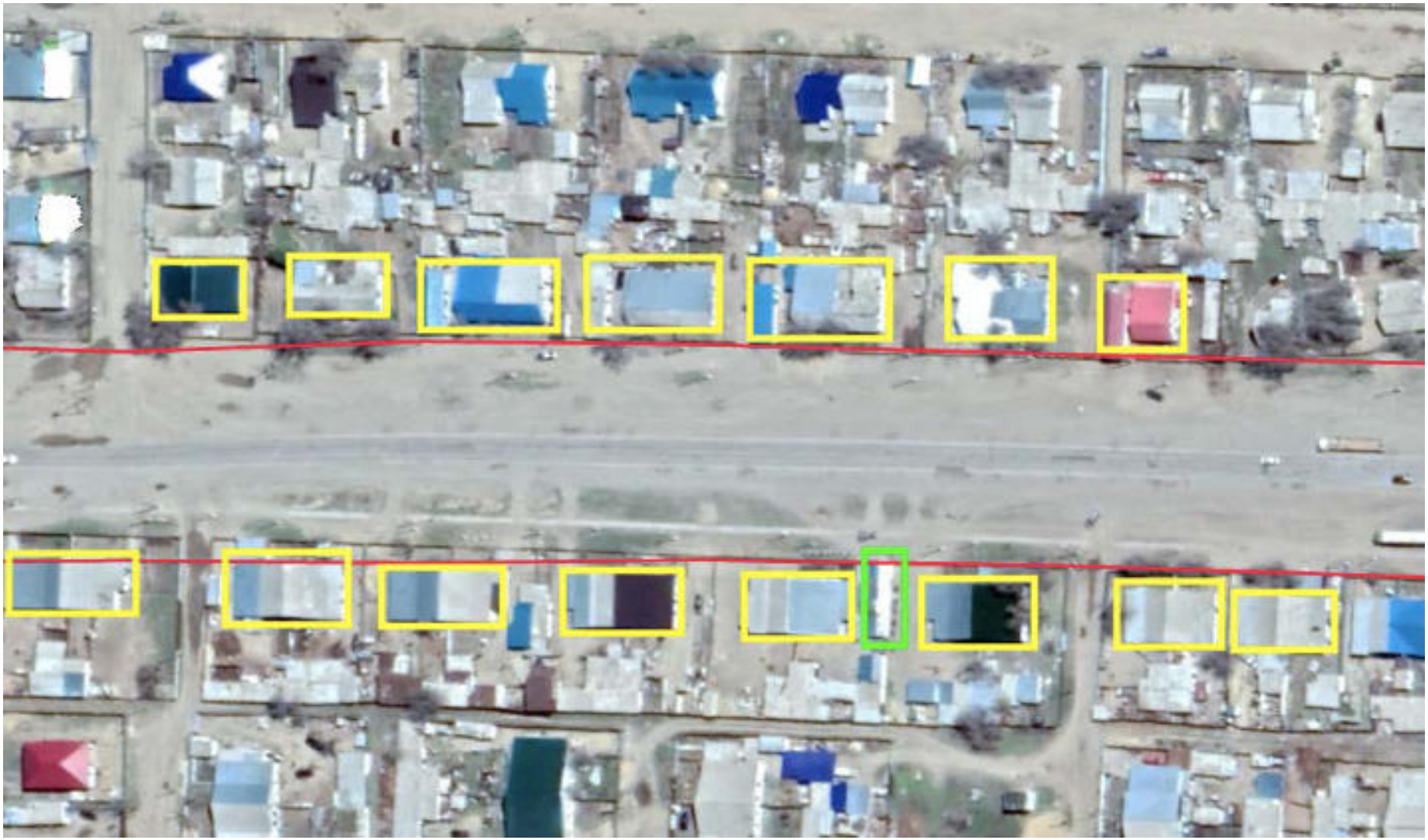
PROPERTIES POTENTIALLY AFFECTED BY CONSTRUCTION VIBRATION

Key:
Red Line / 25 meters from the road centerline
Yellow Line / Residential Property
Green Line / Commercial Property
Blue Line / Mosque



Key:
Red Line / 25 meters from the road centerline
Yellow Line / Residential Property
Green Line / Commercial Property
Blue Line / Mosque

Key:
Red Line / 25 meters from the road centerline
Yellow Line / Residential Property
Green Line / Commercial Property
Blue Line / Mosque



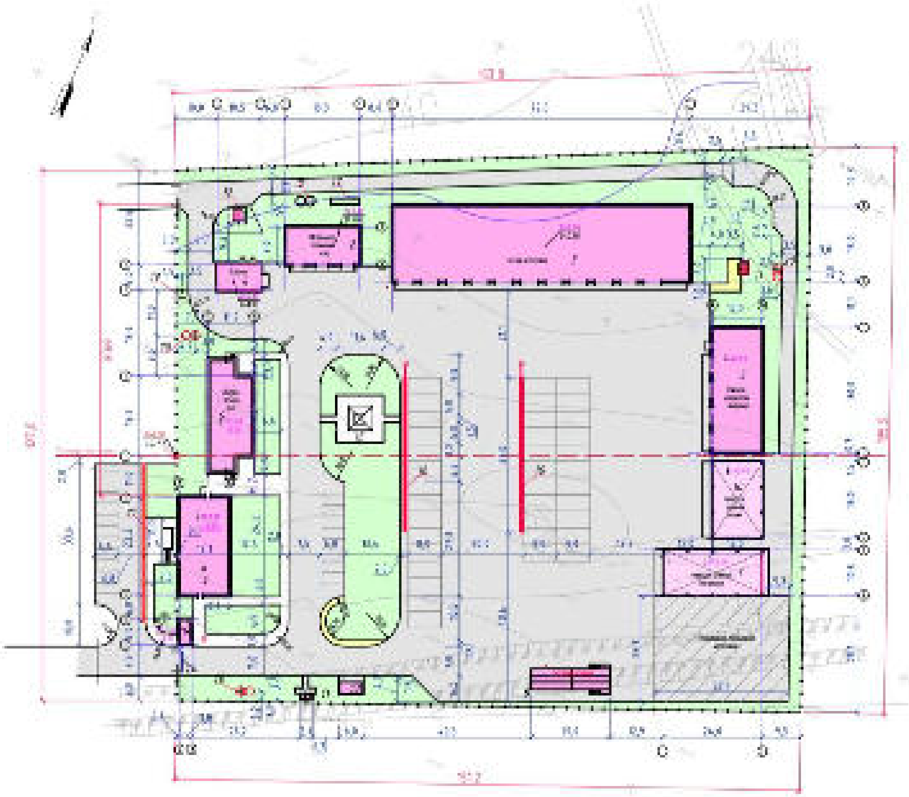
Key:
Red Line / 25 meters from the road centerline
Yellow Line / Residential Property
Green Line / Commercial Property
Blue Line / Mosque

Key:
Red Line / 25 meters from the road centerline
Yellow Line / Residential Property
Green Line / Commercial Property
Blue Line / Mosque

APPENDIX L

SCHEME AND LOCATION OF ROU-11

Scheme of ROU-11



Условные обозначения:

- ограждение участка
- проектируемое здание
- единая абсолютная отметка (разбивочный базис)
- дождеприемный лоток

Примечания:

1. Разбивочный план выполнен на топографической основе по материалам изысканий, произведенных ТОО "ПроектСтройДизайн Актобе" в 2019г.
2. Система высот - условная.
3. Система координат - условная.
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]

Экспликация зданий и сооружений

№ по плану	Наименование	Площадь застройки, м2	Примечание
1	Административное здание (23,18х12,74м)	226,2	Нов
2	Материально-технический склад (18,0х9,0м)	161,1	[illegible]
3	Теплая автостоянка (72,0х18,0м)	1302,5	[illegible]
4	Котельная (10,5х6,0м)	62,7	[illegible]
5	Ремонтно-механическая мастерская (30,9х12,0м)	412,3	[illegible]
6	Обмывочный пункт (19,2х11,2м)	231,0	[illegible]
7	Навес для хранения материалов (24,0х10,0м)	289,3	[illegible]
8	Смотровая эстакада	104,8	[illegible]
9	КПП (3,0х6,0м)	24,5	[illegible]
10	Навес для хранения техники (18,0х12,0м)	258,5	Нов
11	Санблок на 2 очка (2 шт.)	2х15,8	[illegible]
12	КТП-250кВА	3,5	Нов
13	Площадка для мусорных контейнеров (3,0х6,0м)	18,0	Нов
14	Шлагбаум		
15	Беседка	16,0	
16	Дождеприемный лоток	2х10,10	
17	Очистные сооружения дождевых стоков КОН-5	10,5	
18	Накопительная емкость очищенных стоков 2х5м3	2х2,16	
19	Емкость для для полива $V=5,0м^3$	5,55	[illegible]
20	Ж.б. выезд	2х10,6	
21	Дождеприемный лоток	35,1	

Location of ROU-11

Location of RMU