

Initial Environmental Examination (IEE)

For The

**KAZ: Proposed Multitranche Financing Facility for the
CAREC Transport Corridor I (Zhambyl Oblast Section)
Investment Program**

TA No. 7071-KAZ

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Acronyms and Kazakh Terminology

Term	Unit	Definition
Airshed		Refers to the area of air over the road- and most affected by pollutants
Akim		Town Mayor
CEAP		Construction Environmental Action Plan
Code	na	Codes are the specific standards supporting a regulations or norms
DOE		Department of Environment (Oblast level)
EA		Environmental Assessment
EIA		Environmental Impact Assessment
CFH		MOA's Committee of Forestry and Hunting
FIDIC		Internationally accepted construction contract template
FS		Feasibility Study
IEE		Initial Environmental Examination
KAZDOPREKT		Preliminary Design Consultant (Almaty)
MEMR		Ministry of Energy and Mineral Resources
MOA		Ministry of Agriculture
MOEP		Ministry of Environmental Protection
MOH		Ministry of Health
MOTC		Ministry of Transport and Communication
Norm		Norms are regulations supported by the standards or codes
Oblast		Province
PEIA		Preliminary EIA
PMC		Project Management Consultant or Contract Management Service
Rayon		District
RC		MOTC's Roads Committee
SES		Sanitary and Epidemiological Services of MOH
Synergistic Effects/Impact		Two or more impacts that have an effect greater than the sum of the two.

1. Introduction

1. This Initial Environmental Examination (IEE) is a direct requirement of the ADB's safeguards policy for development project planning. The two road sections for which the IEE is being prepared are a subset of seven and comprise the first of three Projects of the Multi-tranche Financing Facility (MFF) loan being provided to the Government of Kazakhstan (GoK). The Project 1 roads are categorized¹ as "B", meaning that only an IEE and Summary IEE (SIEE) are needed, and no 120 day public review is required. The two road sections all part of the East-West National Road passing through Zhambyl Oblast.

2. This IEE is based on the Preliminary EIA (PEIA), prepared by a government consultant in 2007. The PEIA represents a 2-month desk exercise with no field investigation. Under Kazakh law this is a mandatory scoping document, setting the stage for the full EIA which is completed during the detailed design period. It is the EIA that the government uses to guide the mitigation and monitoring actions. Between now and the end of December 2008, alignments, timetables even methods will be modified, therefore the chainages, distances and conditions forming the baseline for this IEE will change, in some instances significantly.

3. *The IEE is a statement of commitment by the Government of Kazakhstan to specific environmental mitigation and monitoring actions, and has been prepared by a ADB consultant on behalf of the proponent the Ministry of Transport and Communication (MTC).*

1.1. Purpose of The IEE

4. The IEE is a guideline to the actions needed to prevent and/or mitigate negative environmental effects. It provides a detailed description of the direct and indirect environmental effects associated with the two proposed Project 1 Roads during key periods of work, and costed mitigative and monitoring actions in the form of an Environmental Management Action Plan or EMP. The IEE also includes an assessment of the implementing agency's capacity to implement and follow up environmental tasks defined and agreed to in the EA documentation such as the implementation of mitigative and monitoring measures and environmental contract clauses. Should significant gaps be identified an institution strengthening program is proposed. The IEE concludes with recommendations for follow up environmental work, such as an EIA and any other more specialized environmental study.

1. Identification of the Project and Project Proponent

5. The Government of Kazakhstan has given presidential priority to the upgrading of the southern road corridor running from Khorgos on the border with PRC east to Aktobe, the border with the Russian Federation, a distance of more than 2,800 km. Further, the Central Asia Regional Economic Cooperation (CAREC) group recently endorsed the Khorgas to Aktobe section through Kazakhstan as an integral link in the upgrading of the Western Europe-Western China Transport Corridor. The GoK has requested assistance from the four main multilateral donors, and an agreement has been reached to proceed with the ADB portion via a small Technical Assistance grant to address engineering and safeguard issues.

¹ ADB categorizes its projects into three main types, A requiring a complete EIA, B requiring only an IEE and C requiring no special assessment other than the inclusion of standard environmental procedures in the contractual agreements between the country and the bank as well as between the country and the contractors undertaking the work (see details in ADB Environmental Guidelines, 2003).

2. The Nature, Size, Location and Importance of the Project

6. The government has requested that ADB provide partial funding for 480 km of this corridor located entirely within Zhambyl Oblast bordering Kyrgyzstan (Map 1). The MFF will be delivered in three Projects, each separate loan involving a number of projects, and therefore each with their own safeguard needs. Each Project will have its own safeguards designation based on the classification of the most sensitive projects within a Project.

7. Project 1 (Table 1) will involve the upgrading of Section 3 between Taraz and Kulan-A for a distance of 79 km and Section 6 between Blagoveschenka and Korday for a distance of 50 km.

Table 1. Description of Project 1 Sections

Proj. No.	Description	Km	Kazakh Road Category	Length	Existing Pavement Width	Existing RoW Width	New Alignment (incl. in Length)	EA Category	New/Existing
		Units		km	m	m	km		
3A	Taraz - Kulan	404-483	I	79	9	40-100	0	B	Improvement of the existing road from Cat-II to Cat-I with concrete pavement
6	Blagoveshchenka - Korday	210 - 260	II	50	9	40-100	0	B	Improvement of the existing road with asphalt pavement Cat-II

km = kilometer, m = meter

8. Kazakhstan has no IEE boundary or scoping specifications per se, therefore internationally accepted standards were applied. The IEE boundaries (Table 2) reflect the distance from the road that potentially significant environmental effects are possible under standard conditions as observed for similar road projects. The distances are based on decades of study and knowledge of the sensitivity of roadside features in response to road improvements (no new road sections or realignments). Further, these boundaries assume that there are no protected or unusual habitats, species, or cultural features located within a 2 km corridor of the roads (confirmed for Project 1 roads).

Table 2. IEE Boundaries

Terrestrial Environment	Aquatic Environment	The Airshed	Acoustic Environment
200m on either side of the road.	50m upstream and 100m downstream of any project road crossing of river	200 m from CL of carriageway [<i>and rising 100m from the road centreline</i>]	200m from CL of road and extended on sensitive areas such as towns and viaducts over settled areas

Note: For any nationally significant or protected site, the impact zone extends to 1 km on either side of the carriageway centerline

9. These boundaries, plus results of consultations with Kazakh technical specialists, were used to establish impacts as well as mitigation and monitoring actions.

10. Kazakhstan has a "protection" zone of 50m extending from either side of the carriageway for the entire length of the E-W road corridor (Personal Communication, April 2008 KAZDORPROJECT Consultant).

11. Within this corridor no landuse such as farming, animal grazing or small business operations is technically permitted, and has been established to reduce accidents and limit health risks from pollutants such as lead in the roadside soils².

1.2. Legal and Administrative Framework for Environmental Protection

12. Kazakhstan's environmental protection system is based on the Soviet command and control top down management system and has three levels. It is implemented via the Ecological Code revised in 2007, and more than 120 norms and codes define how the law must be implemented.

13. At the top is the Environmental Expertise Committee (EEC) established and chaired by the Ministry of Environmental Protection (MOEP), and is located in the capital and has the first and last word on all national level EIAs. After the approval of a ToR and the selection of a licenses EA specialist consultant, a preliminary environmental assessment (PEIA), essentially a scoping-level desk study, done in parallel with an engineering feasibility study is prepared. It is this PEIA that the ADB consultant used to prepare this IEE.

14. At the second level is the Oblast Environment Department which reviews the PEIA first and provides written comments to the MOEPs EEC located in Astana. If needed, specialists from within the Oblast Dept. of Agriculture's Water Resources Committee and Forestry and Hunting Committee and from the Ministry of Health's Sanitary and Epidemiological Services (SES) are asked to contribute. In practice this is rarely done.

15. The EEC-Astana receives the comments and recommendations, reviews/edits them, then sends these to the MOTC, the third level, for action during the detailed design stage of the work.

16. The consultant who prepares the PEIA usually undertakes the EIA (in this case KAZDORPROEKT) and proceeds with the detailed analysis focusing on field work and primary data collection, with strict reference to Kazakh norms and codes. The focus of the EIA is on the preparation of a comprehensive environmental mitigation and monitoring plan (EMP), in the past prepared separately and referred to as an Ecological Passport, but now included as a section of the EIA. The EIA is prepared in parallel with the Detailed Design Study.

17. The EIA undergoes a similar review; first at the Oblast level and then to MOEP and any other agencies MOEP decides to include. Comments are reviewed, edited and assembled by the MOEP. This step takes 30 days, after which the EIA authors are required to defend the EIA at a consultation session with all stakeholders in attendance (usually not the general public). During this 30 day period the public can comment on the EIA, but receive only one announcement in a local newspaper that the EIA is available for review. Provision of contact information and names is not required. After the 30 days, and the EIA defence is complete, there is a public debate where the authors and the proponent can answer questions from anyone. The distribution of contact information for a coordinator or liaison officer leading such a public forum is not required, nor are invitations sent out to concerned stakeholders.

² 85-90% of the country's petrol is leaded and its car and truck fleet is old, with no pollution control devices installed.

18. Once complete, the EIA is revised and a final document is prepared and a certificate to proceed to the next stage is given to the proponent; but usually only after another 30-day waiting period, allowing for any additional comments.

19. Next, the bid documentation, which usually includes a minimum mention of safeguards (similar to what is found in the standard FIDIC template), is completed. The contractors submit bids and a selection committee, which may include safeguard expertise, chooses the winning contractor.

20. The contractor must obtain permits (clearances) to conduct any work where environmental effects are likely, e.g. the tree removal, vegetation clearing, removal of soils, culvert replacement, etc.. These permits can only be issued once the contractor has prepared an environmental work plan or Construction Environmental Action Plan (CEAP) showing how the mitigation and monitoring actions defined in the EMP will be implemented. The preparation of the CEAP requires a licensed person, thus the contractor must retain expertise to do this work and must keep that person/firm to oversee the operation throughout the contract period. These actions and deliverables are excellent but their implementation depends on active and consistent enforcement by the MOTC, which unfortunately is not common.

21. Compliance monitoring is undertaken by the Inspection Unit of the Zhambyl Oblast Environment Department, which has enforcement and fining powers. Inspection occurs once per year and the contractor must receive at least a two-week notice prior to the inspection visit. Further, the contractor is fined only if a 3rd offence occurs and this happens rarely since most contracts are <3 years long.

22. One year into the operating period there is a final inspection and contractor's final payment is released only after a fully compliant audit is recorded. Any issues arising during the audit must be addressed before release of payment.

1.3. Methodology Applied

23. A consultant retained by the GoK completed a Feasibility Study and the PEI for the entire E-W corridor, (road within Zhambyl Oblast were presented as a separate sub-section) in late 2007. The EIA (Chapter 9 of the FS) was examined, followed by consultations with the authors as well as a field reconnaissance of both Project 1 sections. Interviews with national level agencies as well as oblast and rayon-level managers were also undertaken. Collectively these data, plus the information taken from a review of past studies, comprised the information used in this IEE. Aside from the field reconnaissance, this IEE is based totally on secondary information and from other many similar studies.

1.4. Acknowledgement

24. The proponent wishes to acknowledge the participation and contribution to this work of Government of Kazakhstan officials from more than 10 agencies in Taraz, Almaty and Astana at the national, oblast and rayon levels. Without their technical knowledge and experience, this IEE could not have been completed. The provision of data and information from the PEIA authors at KAZDOPROEKT is also acknowledged.

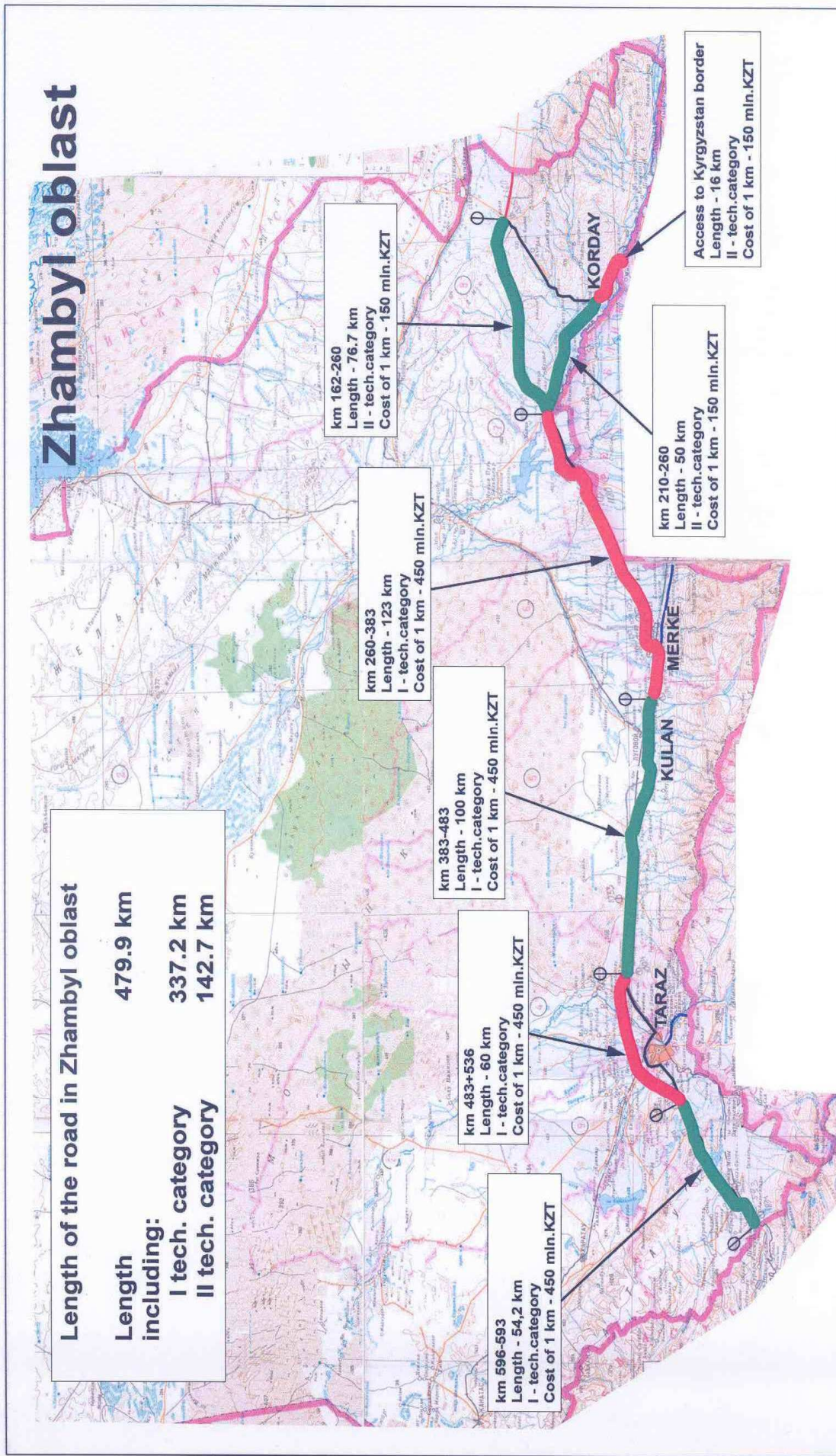


Figure 1. The MFF Loan Project Roads Highlighting the Tranch I Roads No.3 and 6
 Note: the Taraz Merke Section (Sect. No. 3) has been reduced to Taraz-Kulan Bypass A (86 km)

2. Description of the Project

2.1. Type of Project

25. The overall project is an MFF for road rehabilitation within Zhambyl Oblast. The MFF is being delivered via three loans, the first one containing two road sections all requiring improvements, but with no new construction. The work includes road widening, shoulder improvements, pavement strengthening and drainage upgrading, and the reconstruction of 90 culverts and 13 bridges, all within a 40-60m wide RoW.

2.2. Category of Project

26. This IEE covers Project 1 (of three), and contains two project both Category B, making the Project a Category B undertaking³.

2.3. Need for Project

27. In his 2007 address to key officials the President of Kazakhstan stated that this project was a number 1 priority of the country and it would be an essential link in the Western China to Eastern Europe land transportation corridor, stimulating international trade and the local economies along the route. The three major donors endorsed the project for the same reasons, underscoring the need to upgrade Kazakhstan's severely degraded road infrastructure.

2.3.1. Location and Size of Operation

28. As indicated earlier the project located in Zhambyl Oblast will be delivered as three separate loans all under the MFF. Project 1 will have two road sections, Project 2 two and Project 3 three (Table 1). The Project 1 work will likely be contracted as three contracts with the construction period of about 4 years.

29. Although along the same highway Sections 3 and 6 are in differing topographic regions (Figure 1). Section three is between end of the Taraz Bypass and the end of the Western section of the Kulan Bypass, for a total distance of 86 km and the Section 6 from Blogoveshenka to Korday for the total distance of 45 km for a combined total of 131 km

30. Section 3 passes through a near-foothill and undulating steppe region within 10 km of the Tian Shan Mountains, in generally dryer but nevertheless green areas (due to the shallow groundwater and snowmelt runoff). Section 6 is in an irrigated alluvial plain area created by the Shu River. Section 6 is between 0.5 and 4.0 km from the river which flows from Kyrgyzstan northward to Blagoveshenka.

2.3.2. Selection of IEE Projects

31. Project 1 projects (Sect.3 and 6) were selected, since the ADB classified both as B, facilitating quick processing and allowing the work to begin as soon as possible. The two sections were assessed in a single IEE at the request of the ADB and justified on the grounds that environmental effects from upgrading within the RoW involving no realignments and no unusual construction methods in a reasonably uniform climatic zone could be examined in a single assessment.

³ As of June 1st the project was reorganized and Sections 1 and 2 will now be funded by the Islamic Development Bank, but following ADB safeguard procedures as defined in the EARF.

2.3.3. Rapid Environmental Assessment Results

32. The Rapid Environmental Assessment (REA) completed for all 7 projects by the ADB identified Project I as category B, while Project II and III were both A since both contained roads with many km of new construction in complex ecological areas⁴ (Table 1).

2.3.4. The selected Road for IEE application

33. The project is located totally within Zhambyl Oblast, and involves two roads referred to as Project 1 of the MFF Loan package.

34. Project 1 will involve Road Project No. 3 and 6 and three to four construction packages worth a total of about \$ 462 million, including the replacement of 90 large concrete box and steel pipe culverts, 13 road bridges and one railway elevated structure. An Environmental Assessment and Review Framework (EARF) has been prepared (Sect. 5) for the Project 2 and 3 roads. EARF will provide guidance on how future EAs are to be undertaken, including guidance on methods, likely impacts, mitigation and monitoring needs, consultation and reporting and evaluation by both the proponent and the donor. This framework will be used by the three donors participating in the overall trans-Kazakhstan road improvement project.

2.4. Proposed Implementation Schedule

35. The implementation schedule is now being formulated but in general terms (based on internal discussions and comments by the MOTC) tendering will be completed by mid 2009 with mobilization of the contractors by the end of 2009 or the first quarter of 2010. Construction is expected to continue from 3-4 years through 2012 and end sometime in late 2012 or early 2013. To date bid document preparation has not started and in fact detailed design has begun but the full EIA work has not started. As indicated in Section 1.2 the bid document preparation needs to be undertaken with the completed EIA and its EMP in hand. The size of contracts has not been decided but there will likely be anywhere from three to seven contracts, each worth between USD 66 -175 million each.

2.5. Project Layout and Components of the Work

36. Project 1 work will be undertaken totally within the existing RoW along the two road sections defined in Sect 2.3.1 and Table 1. The work will include doubling the carriageway width, strengthening/paving shoulders, raising the vertical alignment, replacing the asphalt with stronger and longer wearing formulas, replacing some asphalt sections with a concrete carriageway, replacing all culverts and replacing (some widening, repairing and strengthening) nearly all bridges. Contractors will require large volumes of fill material, rocks and aggregated. The procurement of necessary aggregate materials will require sourcing from existing sand new aggregate sites for which licenses will be needed. Transport will be road and rail, depending on cost. The sequence of the work is unknown at this time but will be elaborated in the contractor's CEAP, prepared by the EIA expertise that will be retained by each contractor (a legal requirement under Kazakh law).

⁴ The World Bank's sections are much longer and contain long new bypasses but since located for the most part in semi-desert areas with population densities of <1person/km², and no private land was needed, the Category B was appropriate.

3. Description of the Environment

3.1. Physical Resources

3.1.1. Climate

37. Generally the climate on the project area is temperate and continental, with rain accumulations of 31 cm from during a short rainy period and snow fall of about 38 cm over the November to March period. These data are for Zhambyl oblast as a whole and therefore values for the project corridor are likely 25% higher, given the proximity of the mountains. Temperatures are hot in the summer reaching into the high 30s and in winter well below freezing and as low as -25C. Section 3 being close to the mountains has unpredictable weather with severe rainstorms in the summer and snow with high winds in the winter creating blizzard and wind-chill conditions.

38. Korday and points east have about 32% more rain and snow than Road Sect. 3

39. Being at about 44° North latitude, there are approximately 8 hours daylight in the winter and 16 hours in full summer.

40. Winds are variable but generally are from the West at about 2.8m/sec. and move along the foot of the mountain range. Occasionally winds blow in from the north bringing bitter temperatures in the winter and cooler air in the summer and fall. Near Korday weather influenced by the river and massive Kyrgyz mountains results in a much windier condition with average wind speeds of 6 m/sec, mostly from the Southeast.

3.1.2. Air Quality and Noise

3. Air Quality

41. Air quality within a 100 m wide corridor over the road was estimated using the CREDA model. For Sect. 3 a traffic volume of 5385 vh/day and for Sect. 1120 vh/day was applied. Other key parameters added were a breakdown of the fleet make up, average speeds, age of the fleet and diesel versus petrol use. Road roughness measures were also included. For Sect. 3 at 10m from the road all but NOx and lead are within standards. Both lead and NOx exceed the standard even at 50m from the roadside. The large exceedence for lead can be explained by the use of leaded petrol by as much as 90% of vehicle fleet⁵.

⁵ GoK has indicated that as of 2009 it will be stop producing leaded fuel

Table 3. Ambient Air Quality Within 50 m from Pavement Edge

Parameters Modeled All units mg/m ³ except Pb in ug/m ³ Meters from pavement	KAZ Standard	Terez-Merke: No 3: Km 1004-1123 (119 km)				Blagoveschenka-Korday: No 6: Km 1269-1271 (2 km)			
		North Side		South Side		North Side		South Side	
	mg/m ³	10	50	10	50	10	50	20	60
Carbon Monoxide	3.0	2.442	1.112	2.244	1.080	0.000	0.000	0.41	0.18
Oxides of Nitrogen	0.04	1.643	0.748	0.510	0.726	0.000	0.000	0.04	0.02
Hydrocarbons	1.5	0.229	0.104	0.211	0.101	0.000	0.000	0.08	0.04
Soot (TSP)	0.150	0.036	0.016	0.033	0.016	-	-		
Lead	0.0003	0.00071	0.00032	0.00065	0.00031	0.000	0.000	0.0000	0.0001

Note: Values are averaged over the length of the road sections and data errors are a minimum 25 % under estimates.

Source: KAZDOPROEKT 2007 PEIA Study; CREDO model estimates (to be verified during EIA)

42. The estimates for Sect. 6 seemed to have all but failed since with a traffic volume more than double that for Sect. 3, pollution levels of 0.00 for most parameters is impossible. Based in the traffic volumes alone the emission levels along Sect. 6 are certainly at least the same as for Section 3 and likely much higher since its traffic volume is double that of Sect. 3.

43. Given the known association with brain function impairment, particularly in children, lead has been banned from fuels in many countries for decades. Values estimated in the PEIA even at 100m from the road are alarming, namely almost three times the GoK standard⁶. Aerosol (in the air) lead is the most easily absorbed and most dangerous for humans, and may be taken in by construction workers as they excavate the shoulders for road widening.

44. NOx is a byproduct of the burning of diesel fuel. The higher the NOx emissions the poorer the quality (due to poor refining) of the fuel. NOx when mixed with water forms nitric acid and comes to earth as acid rain and acidic aerosol, damaging people, plants and structures. For Road Sect. 3, NOx levels even 100m from the road were almost 20x the permitted level.

45. With other parameters so high it is questionable whether the model results for soot are correct, since Kazakh truck and bus fleets is at least 10 or more years old with many vehicles more than 20 years old, are poorly maintained and emit large amounts of TSP. Further any newer vehicles coming to Kazakhstan would have their catalytic converters, rendered useless after even the first tank of leaded fuel.

4. Noise

46. Using the same approach and same traffic volume and characteristics data average noise levels at varying distances from the roadside was estimated. Predictions presented in Table 4 are for four distances from the carriageway edge. With less than half of the traffic of Sect. 6, Sect. 3 noise levels are on average 10dBA higher. Under field conditions this would mean that traffic volumes would need to be almost 3X that of Sect. 6 instead of the other way around?

47. Given the speed at which vehicles travel and the many acceleration deceleration cycles that take place, noise levels in the 75-80 dBA at 10m from the road would be more appropriate,

⁶ The GOK standard is significantly less stringent than internationally accepted human health impact lead levels.

then the levels estimated. However, if one were to assume that the noise levels for 50 m are reasonably correct then noise should not be an issue during the daytime.

Table 4. Noise Levels for 2007 Averaged Over Road Lengths for Sect. 3 & 6

Section Name and No.	Peak Traffic Vol. (vh/day)	Km along Road: (chainage)	Noise (dBA) at Distance from Carriageway Edge				
			Distance	7.5	25	50	100
Taraz-Merke: (No. 3 plus Kulan Bypass B)	5385	1004-1123	73	72	69.7	66.5	
			Distance	10	25	50	100
Blagoveschenka-Korday: No. 6	11120	1269-1271	65	62.5	59.7	56.7	

KAZ Regulation (Standards) Summary: KZ has only a single standard of 70 dBA for roadside areas.

Source: Kazdoproekt Preliminary EIA report. 2007

Note: The noise levels provided are based on the Russian CREDO model which estimates both noise and air quality levels based on traffic volumes and a number of other factors. No field verification was undertaken, and **levels at the 10 and 25 m distance appear to be under estimates**, based on past experience and the roadside noise experienced in the field by the survey team.

Noise above 60dBA at night is annoying and will result in sleep deprivation among residents, even 100m away from the roadside.

48. Predicted noise levels are within the 70 dBA limit but exceed night time limits using internationally accepted standards between 55-58 dBA maximums. Internationally accepted daytime measurements for residential Landuse areas should be ≤ 65 dBA. For Sect. 3 even at 100m the noise level is slightly above (inaudible to the human ear) the international daytime standard.

3.1.3. Topography, Geology and Soils

5. Topography and Geology

49. The topography of the two road sections is quite different with Section 3 passing across an undulating inclined steppe and foothills terrain, while Section 6 is basically in the flat Shu River alluvial plain paralleling the water course.

50. The geology reflects this difference in that Section 3 has gravel and unconsolidated aggregate deposits extending as fingers from the Shan Tian mountains northward toward the dry steppes, covered with a relatively thin topsoil, while Sect. 6 is on deep alluvial deposits left by the meanders of the Shu River, as it flows from Issyk kul Lake in Khyrgyztan through the Tashomkesh Reservoir near Blagoveschenka northward in a long arc across the center of Zhambyl Oblast.

51. The geology through Sect. 6 presents a problem in that aggregate sources are not readily available and will need to be hauled either by truck or preferably by rail to a storage area for use by that project. Section 3 has readily available supplies but selection of new sites will be important given the visually stunning landscape and gently sculpted terrain.

6. Soils

52. In the context of this IEE discussion of soils will focus on roadside soils that will need to be excavated as part of the widening activity. The use of leaded fuels by >90% of cars has

made roadside soils toxic. For this reason the roadside soil quality was modeled by the PEIA consultant. The data, even without any fieldwork, present a dangerous picture (

53. Table) and indicate that the roadside soil surface layer to at least 50cm depth is highly contaminated with lead, as much as 15-20 times the GoK standard⁷. Somewhere between 40 and 50m from the roadside levels fall to at or near the standard. Interestingly, Section 6 did not show the same level of contamination, however only the actual field sampling will reveal the truth.

Table 5. Estimated Lead Levels in Roadside Soils in Relation to 20 Yr. Averages

Parameters Modeled	KAZ	Taraz-Merke: No 3: Km 1004-1123 (119 km)				Blagoveschenka-Korday: No 6: Km 1269-1271 (2 km)			
	Standard	North Side		South Side		North Side		South Side	
	mg/ kg soil	10	20	10	20	10	20	10	20
Lead: 1986-2006 Avg.	32	61.6	13.23	61.6	29.07	5.2	0.85	3.8	7.63
Lead: 2007 Pollution In Soil	32	183.7	36.74	403.7	80.74	12.5	2.36	80.8	17.16

Source: KAZDOPROEKT 2007 PEIA Report

Note: At 40 m distance values fall just be permissible level of 32 mg/kg soil

3.1.4. Surface and Groundwater Quantity and Quality

7. Surface Water

54. The work on Section 3 will not require any new water crossings but there will be approximately 90 culverts replaced; many being enlarged concrete box culverts, partially poured in place. Old culverts will be removed and during that process any existing water flows will be diverted, creating the potential for increases in sediment loads, bank erosion and damage to existing stream channels. No data exist for the quality of these mostly intermittent flow channels, but they will be marked on the design drawings.

Table 6. Ambient Water Quality Conditions in Rivers Near or Crossed by the Road Sections

Sections and Water Bodies		Zinc	Copper	Oil	BOD ₅	Chrom 6+	Phenol	TSS
Units of Measure	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Taraz-Kulan A: No. 3	There are no river or stream crossings along this stretch							
		No data			No data	No data		No data
Blagoveschenka-Korday: No. 6								
Shu River (Site No.	11/07		0.0037	0.08			0.002	
Aksu River	11/07		0.0027				0.002	
Tashutkul Reservoir (short distance downstream of Shu crossing)	11/07		0.0046				0.002	
Kaz Standard: Drinking and Community Use Water		1.0	1.0	0.30	3.0	0.05	0.001	
Kaz Standard: Waters Utilized by Fish and Fisheries		0.01	0.001	0.05	3.0	0.02	0.001	

Source: Shu-Talas River Basin Authority and KAZHYDROMET 2006 data

Note: despite TPM being the greatest polluter from roads and construction Kazakhstan does not sample for this parameter.

⁷ It should be noted that these standard are significantly below internationally accepted standards making the lead levels that much more dangerous. The fact that these areas are used for vegetable growing and animal grazing poses serious health hazards.

55. Sections 3 and 6 have 13 bridges which all have to be rebuilt and widened. The Shu River is the largest river and is crossed by the existing Section 6 at Blagoveschenka. It drains Issyk Kul Lake in Kyrgyzstan and flows northward into Kazakhstan, through central Zhambyl Oblast. It receives Bishkek's raw sewage in a large discharge canal as well as untreated industrial wastes before flowing into Kazakhstan. Along the way into Kazakhstan there is considerable diversion and intensive agriculture, reducing the flow and further contaminating the water. The water quality of the Shu (Table) is badly degraded and the bridge replacement work will not contribute to further contamination so long as careful construction methods (as outlined in Annex 4) are applied.

56. While no data exists for the two other named rivers crossed by the Sect. 6, they are both tributaries of the Shu, draining the intensively used grazing and farming lands to the NE of the Sect. 6 road and therefore likely degraded. Estimated water quality conditions are shown in Table.

8. Groundwater

57. Groundwater aquifers in Sections 3 and 6 occur at two levels. The shallow groundwater aquifer is within 1-2m below the surface and is heavily influenced by surface water contamination, such as from road runoff and agricultural drainage. To examine the shallow GW aquifer quality surface water quality was used as an indicator. This approach suggested that the shallow aquifer is contaminated and was confirmed by the fact that it is not used for drinking unless treated.

58. Modest concerns for the shallow aquifer are that road runoff will increase leading to higher petroleum, phenol and lead contamination. While not measured, an examination of the concentrations in the air and soil near the road suggests that there is a strong likelihood that significant road-related pollution is taking place. Fortunately most of the stormwater runoff does not flow directly (other than from bridge decks) into streams, but instead is diverted to an infiltration area near the shoulder of the road before emptying into a water course or percolating into the soil. The exception is in urban areas where there are concrete drains.

59. Rainfall along the road is relatively infrequent, with a total annual precipitation (2007) of 30.3 cm, all occurring within a few weeks in the spring and early summer. This means that the first flush of stormwater is highly contaminated.

60. The deep groundwater aquifer located 20-30 m below the surface is relatively unaffected by the road works since there will be no pile driving or deep excavation and groundwater quality data were not available.

3.2. Ecological Resources

3.2.1. Forests, Wildlife, and Rare and Endangered Species

61. An examination of the Kazakhstan and World Wildlife Fund Redbook on endangered plants and animals, the Birdlife Int'l. website, the RAMSAR website, and discussions with the Env. Department in Taraz as well as the FHC expert recorded no rare, endangered species or protected sites in the project corridor. The closest site is 50km away.

62. The Kazakhstan Ecological Atlas (2006) was also examined and a search of the text found no reference to any protected species or habitat anywhere within the corridor of impact.

63. There are no natural forest lands along either Section, but instead shelter belts, in some cases 4-8 trees deep, extend for several kilometers along Sect. 6, with mature ash and poplar dominating. These are between 30-50 years old and form a kind of micro-habitat along the road. There is unusual vegetation associated with this habitat, including the wild blue columbine and the wild garlic (both common in shaded edges of shelter belts in general. Wild poppies often occur as well, but are very common and considered a pest species by farmers.

64. There are a few small wetlands along Sect. 3, particularly as the road alignment comes closer to the Tian Shan mountain range or to other smaller streams West of Kulan. These wetlands are likely formed by shallow groundwater upwellings supported by snowmelt runoff and shallow subsurface flows, but likely dry out in late summer.

65. The rapid reconnaissance did not permit a careful survey of wildlife but common birds noted included doves, ravens (several rookeries are located in the shelter belt along Sect. 3), large flocks of common mynah birds. Larger animals include the Asiatic ground squirrels (far from the alignment) and the Eurasian or Asiatic wolves which occasionally invade from the north and prowl the relatively fertile and mild area in search of food, principally livestock. These are wary animals and encounters with traffic in winter are extremely rare and construction will have very little impact.

66. The project corridor is on the Caspian, Siberian and/or Central Asian Flyways to and from the Siberian wetlands and as such large migrating flocks can be seen in the fields beside the road from spring through early summer and again in the fall. During field visit along Sect. 3 on May 6th, several flocks of steppe eagles, numbering in the many 100s, were seen in the roadside fields. This is an established species and thrives in the steppe zone and lower mountains of the Tian Shan range.

3.3. Human and Economic Development

3.3.1. Population and Community

67. The population of Zhambyl Oblast in 2007 was about 1.009 million people, with the density of about 7 people to km². Population is predominantly Kazakh ethnics (64.8%), with Russians (18.1%) being the next largest group, followed by Uzbeks (2.3%), Tatars (1.3%) and Germans (1.2%). There are 10 districts (rayons) in the oblast, 3 cities (excluding Taraz) and more than 300 villages. The Road Section 3 and 6 will go through 3 districts (rayons) of Zhambyl Oblast: T. Ryskulov, Merke and Korday. All 3 districts are primarily rural, consisting of more than 3,500 cooperative and private farm units cultivating more than 250 thousand ha. of farmland (Table). The T Ryskulov district has the population of 61 thousand people, with the density of 6.7 people/ km². The Merke and Korday district, which is part of the Section 6 road alignment, has the combined population of 184 thousand people, with about 11 people/km² (Table).

Table 7. National and Oblast Population, Poverty and Unemployment

Oblast	Population, Poverty and Unemployment							
	Total, 000 (2007)	Urban, 000 (2007)	Rural, 000 (2007)	% Urban population (2007)	% rural population (2007)	Density (people/km ²)	% of people below subsistence minimum (2006)	Unemployment level (2006)
Zhambyl oblast	1,009	453	555	44.98%	55.01%	7	23.6%	9.2%
Kazakhstan Total	15,397	8,833	6,563	57.37%	42.63%	5.7	18.2%	7.8%

Source: National Agency for Statistics 2007

68. Though the area is sparsely populated, much of the arable land to the south of the alignment is occupied and used for farming. Section 3 of the Project 1 project passes through 8 towns and villages of the T. Ryskulov rayon directly on the road and another 4-5 within 20m of the pavement edge. A large number of small feeder roads connect with the highway suggesting that this is a significant access point to larger markets for the villages scattered in the foothills.

69. All communities (towns and villages) operate on the traditional Kazakh village model with a government assigned Akim, a council and the citizens' committees involved in managing the affairs of the local area. As a carryover from the soviet era, a strict chain of command-and-control policies and division of labour exists, resulting in very slow and protracted institutional involvement.

Table 8. District Population and Agricultural Production

Rayon	Total Population (2007)	Area of Rayon (km ²)	Density (people/km ²)	Volume of Production, (million Tenge)	Total number of Farm Units	Farmland, thousand ha	Investments, (million Tenge)	Average Monthly Salary, Tenge
T. Ryskulov Rayon- Section 3	61,200	9,100	6.73	495.44	1149	87.8	920.2	28,351
Merke Rayon- Section 6	73,300	7,100	10.32	936.81	1297	68.4	525.8	26,612
Korday Rayon- Section 6	111,300	9,000	12.37	1,043.91	1334	96.4	879.0	29,539

Source: National Agency for Statistics 2007

3.3.2. Infrastructure and facilities (water supply, sewerage, drainage/control)

70. Outside the main urban areas infrastructure aside from electrical power is scarce. Power supplied from the grid provides a reasonably steady supply to the villages and towns in and near the road corridor. In urban areas the stormwater is drained into stormwater canals or in few cases actual sewers for discharge in local streams. Most of the stormwater is simply directed to the side of the road and then infiltrates into the soil. Overall there is very little drainage control. At bridges water is directed vertically through drain holes in the bridge deck to the stream or area below.

71. Potable water comes from local wells and boreholes, with piped potable water in homes a rarity (aside from Taraz, Merke and Blagoveschenka). An estimated 65 % of the corridor population has no piped potable water in their homes.

72. The vast majority of sewage treatment is via pit privies and septic tanks, with much of the waste being disposed of manually after cleaning of the privy storage tanks. Sewage is usually buried as there is no tradition of using these materials as fertilizer. About 90 % of the households in the corridor rely on outdoor plumbing, and in winter must haul and heat water for consumption cooking and washing.

73. It is hoped that the improved road may bring small scale investment and raise the living standard of local people, including the provision of better municipal services.

74. There is no solid waste collection or disposal system, therefore most towns and villages are littered with glass and plastic bottle, many of them broken. Interestingly, roadsides in the corridor are for the most part quite litter free.

75. Also please see Sect. 3.4 below.

3.3.3. Industries and Employment

76. In Zhambyl Oblast, manufacturing comprises the major part of industry at 82.6% of the oblast's production (Table). This includes one of the largest phosphorous and agricultural fertilizers production facilities in Kazakhstan. The Taraz Metallurgy Plant (formerly phosphorous plant) currently produces 120 thousands tones of various phosphorus products as well as 97.8 thousand tones of mineral fertilizers per year. Other industrial production includes electricity and natural gas at 12.6%, and other mining at 4.8%.

77. More than 55% of population lives in rural agricultural area, pursuing dryland farming, livestock raising and some market garden and orchard farms near the mountains some distance from the road. Agricultural production consists of approximately 362 agro-industrial enterprises, 12,196 farms, and 166,787 small scale private farms, which all roughly provide 6% of all agricultural production of the country. The agricultural production includes wheat, various vegetables and fruit, meat and meat products, dairy and dairy products. Recently under the Government Programme for Industrial and Innovation Development, the new large-capacity meat processing and tinning factory has been opened in Merke. In the Section 3 corridor there is also a large apiculture industry, reflected in the large amount of roadside honey sales.

Table 9. Economy, Investment and Transport

Oblast	Economy, Investment and Transport (Millions of Tenge)							
	Industrial Production	Total Agricultural Production	Plant-growing Production	Live-stock farming production	Volume of Provided Services	Investments	Turnover of cargo transport, Mil. Tonne-km	Turnover of passenger transport. Mil. Tonne-km
Zhambyl oblast	74366.4	45737.4	26188.3	19549.1	11030.2	22182	1283.2	3156.8

3.3.4. Transportation (road, rail air)

78. At present, the project corridor has one truly all weather road which is the main road to Tashkent as well as the Caspian Sea. Sections 3 and 6 are a part of that road. There is a second road which travels north from Kulan to Shu Town but after Shu narrows to a dirt track for about 50 km between Shokpar and Bel before becoming a class II road again.

79. East of Blagoveschenka, there are a number of N-S options but all are Class III and IV road, most impassable during parts of the year.

80. The corridor is well served by the national railway system, with virtually every town and village having a railway stop. The railway actually parallels road Section 3 for its entire route between Taraz and Kulan. Most large volumes of dry goods are shipped by rail.

81. For road Sect. 6 the road network is considerably better, but consists of short north-south feeder roads. Section 6 is still the only Class I option to the east.

82. The only international airport servicing the corridor is in Almaty, although Bishkek is frequently used as the international hub for people from the region. There is also a local airport in Shimkent.

3.3.5. Landuse and Terrain

83. Landuse along the corridor is dominated by agriculture; mostly grazing and dry cash crops such as wheat and corn. Given the predominantly undulating landscape with many small gullies, large field operations are not suitable. As such there are few wheat growing areas, but

instead a great deal of cattle, goat and sheep grazing. Sect. 6 is flatter and sits on an alluvial plain formed by the Shu River. As a result this area is more heavily oriented to crop as opposed to livestock farming.

3.4. Quality of Life and Health Services

84. Life in the villages and towns within the corridor is harsh. This is particularly true for Sect. 3 where most household heat with wood, have communal outdoors wells, have outdoor pit privies and in winter have no services for snow clearing and road maintenance (most roads are gravel and mud during the spring thaw). Tuberculosis and anthrax are two dangerous diseases common in the region, particularly during the cold months (October-March). During the winter it is difficult to reach the main road, with feeder roads often impassible.

85. There are 58 hospitals with 2.5 thousand doctors and 7.8 thousand other medical personnel in Zhambyl Oblast. Currently, the healthcare system is organized into representatives in oblast, rayon and municipal levels of responsibility. The Soviet system of the 1980 with a healthcare network of hospitals and ambulatories from oblast level to municipalities, and to small clinics in the villages collapsed after 1990. Presently, village level clinics cannot deliver health care or have very limited capacities because of severe a shortage of personnel (e.g., usually 1 nurse or midwife representative per village or several villages).

Table 10. Summary of Oblast Public Health Services and Conditions: 2006

	Number of doctors per 10,000 people	Number of nurses per 10,000	Number of midwives for 10,000	Births per 1,000 people	Deaths per 1,000 people	Deaths for newborn for 1,000	Number of hospital beds for 10,000	Number of ambulatory hospital beds for 10,000	Tuberculosis all forms for 100,000 people	Diabetes all types for 100,000	Heart Attacks for 100,000	All types of Cancers for 100,000
Zhambyl oblast	25.5	53.3	8.8	23.73	8.8	13.42	58.9	48.7	126.8	1008.3	425.2	410.3
Overall Kazakhstan	37.6	54.2	5.7	19.17	10.27	13.91	68.3	52.3	132.1	1081.1	478.6	811.4

86. Also, the oblast and rayon level healthcare institutions are being restructured from being purely public to being semi-private institutions. The construction of the new road will likely give the rural population easier access to healthcare services based in municipalities, and could also attract healthcare workers given much improved year-round high quality paved roads.

87. Table 11 suggests a fertile population with a replacement rate of about 2-3 births per death, i.e., the population is increasing in the three project Rayons.

Table 11. Births, Deaths in The Districts (Rayons) of Zhambyl Oblast

Rayon Name	Births	Deaths
Ryskulov	1542	460
Merke	1800	627
Korday	3237	945

3.4.1. Education

88. In Zhambyl, as in other regions of Kazakhstan, public secondary education is mandatory for all children under 18 years of age. According to National Statistical Agency, for January 2008, 99.6% of schools in Zhambyl oblast are computerized, 93% of schools connected to telephone land lines, and 88.2% of schools have access to internet. The colleges and universities are not free and charge substantial annual tuition fees. Zhambyl oblast has 476 schools with 204.5 thousand students, 28 colleges with 24.1 thousand students, and 5 higher education institutes and universities with 37.3 thousand students. Most of higher education institutions are located in Taraz, and Karatau.

3.4.2. Recreational Resources and Development

89. The project area, particularly along Sect. 3 is presently undeveloped in terms of recreational resources, but has enormous potential given the spectacular beauty of the land, the proximity of snow-capped peaks, alpine forests, the unique steppe ecosystem and the small villages scattered through the foothills. The road passes within a few kilometers of all these features.

90. At present the view from the road presents a pastoral scene of grazing and farming lands set in rolling hills, framed by snowcapped peaks, ideal for recreational activities.

91. Section 6 has few recreational opportunities as it passes through basically flat agricultural lands, ending in Korday, with a magnificent view of the Khyrgyz mountains.

3.4.3. Archaeological, Historical and Cultural Treasures

92. No known cultural relics or historically important sites will be disturbed by the road improvements planned. There are a number of roadside grave markers and graves of accident victims which will need to be moved to accommodate widening. It is estimated that there 10-14 of these on Section 3 and 5-10 along Section 6.

93. While graveyards are visible from the road they are more than 75m from the edge of the carriageway

3.4.4. Cultural Values

94. Culturally the project area is settled by Kazakhs 64.8%, Russians 18.1%, Uzbeks 2.3%, Germans 1.2%, Tatars 1.3% and others 12.3%.

3.4.5. Human Settlement in the RoWs

95. Zhambyl Oblast's population in 2007 was about 1million people with the density of 7 people/ km². Much of that population lives in a 15km wide belt along the foot of the Kyrgyzskiy or Tian Shan Mountain and Karatau Mountain ranges and along the Shu River. Since about 75% of the population is in this narrow belt, making up about 30% of the total land area, the effective population density is much higher, and is clearly noticeable as one travels along the road. There are many small villages of a few houses along or near the road and much of the roadside land is used for agriculture. There is little or no heavy industry anywhere along the two sections, other than in the towns of Blagoveshenka, Merke, Kulan and Taraz, with bypasses planned for the latter three.

4. Screening of Potential Impacts and Mitigation Measures

96. Twenty-four significant potential impacts were identified, as well as an equal number of mitigative measures that will need to be implemented. For the preconstruction period there are five, for the construction period 14 and for the operational period five. Many of the measures involve several sub-actions (See Annex Tables 1A and 1B).

4.1. Impacts

97. Impacts are broadly defined as any effect whether direct or indirect which have the potential for degrading the natural or biophysical environment. These can stem from physical actions or from policy or program inaction, causing a problems. The impacts and mitigative measures highlighted in Sections 4.1.1-4.1.3 represent a subset of the full number described in detail in the EMP and specifically in the two Annex 1 tables. Mitigation and monitoring measures have been cross referenced, such that contractors can easily use them to prepare their mandatory CEAP as specified by GoK law.

4.1.1. Pre Construction

98. Annex Table 1A defines 7 preconstruction mitigative measures, each addressing actions needed by either the proponent or the designers to prevent negative impacts from occurring later in the project's development. This section presents a set of preventative policy, programmatic and design actions which when implemented will avoid impacts, save costs and reduce potential delays.

99. The most frequent reasons why EIAs and their EMPs are not used is because the implementing agency or proponent lacks the knowledge and experience to do the work, is not provided the proper documents in the local working language and thirdly has no knowledge of how to integrate mitigation and monitoring requirements into the bid and contract documentation. MOTC will ensure that this does not happened and will provide the necessary translated materials to all key stakeholders.

100. Another major mitigative action is for the design team to include at least four design elements addressing the problems of livestock on the roads, shelter belt protection, construction traffic management and culvert and bridge replacement. MOTC will insure that this takes place.

101. The PEIA study suggested high lead levels in the roadside soil as much as 20 times the accepted standard, stemming from the extensive use of leaded fuels. These contaminated roadside areas will require excavation for road widening and are presently used for livestock grazing and growing of consumable crops. Given the potential for contractors having to handle a toxic material, a testing program will be undertaken to examine the lead contamination in the soils and a number of foods coming from these areas and based on the findings a protocol will be defined. The sampling design framework is proposed in Annex Table 1B but details will be arranged with the Sanitary and Epidemiological Services (SES) of the Ministry of Health. Should these areas need to be excavated, contractors will have to obtain special permits and find suitable sites for burying the contaminated soils. These materials will not be reused as fill since such use could easily reintroduce lead into the surface water and local airshed. Highly contaminated sites will be posted and local farmers notified.

102. MOTC and its Roads Committee (RC) and the road design team preparing the detailed design study will be responsible for implementing all pre-construction mitigation measures. It may be that a Project Management Consultant (PMC) will take over control of all aspects of

project management and control⁸ in which case it will make sure that mitigative measures are implemented.

4.1.2. Construction Period Potential Impacts

103. Fourteen construction period impacts are identified in the ANNEX Table 1A with implementing responsibility falling with the contractors and all subcontractors doing the work. Monitoring of the implementation of these measures will be supervised by the RC or the PMC. A few of the important impacts and mitigative measures are summarized below.

1. Inadequate Technical Capacity

104. The essential first mitigative action will be for the contractor to retain environmental safeguard expertise to complete the CEAP or “Ecological Passport” as it was referred to in the regulations, and obtain the various permits to begin the work. The MOTC’s RC will ensure that each contractor has this expertise and it is retained for the duration all contracts. The GoK recognizes that hiring an ‘environmental expert’ is not a guarantee that credible work will be done, and therefore will hold a training workshop in EMP implementation and monitoring focusing on donor requirements. The target audience will be contracts, the monitors and other Zhambyl Oblast agencies. This will be supported with the provision of an international safeguard’s specialist to assist each contractor with the preparation of their CEAP.

2. Earthworks and Aggregate Site Operations Mismanagement

105. Five impacts and associated mitigative measures (Annex Table 1A) address issues surrounding earthworks. These are the handling and transport of materials, storage of topsoil, repair to cut and fills, aggregate site planning and management of construction related dust and noise. Detailed actions are indicated and the RC and/or the PMC will insure that the steps as specified in the IEE’s EMP are undertaken.

3. Failure to Manage Lead Contaminated Soils

106. The roadside soil lead testing program will identify the general levels of contaminated in terms of distance from the road and to what depth. Any soil found to have lead levels consistently above the GoK standard and requiring excavation to widen the road will be treated as toxic material and need a disposal permit and agreement with the experts on how to dispose of or detoxify the soils. Strict record of all such works will be maintained by the contractor. The SES will be directly involved in establishing any needed disposal protocol.

4. Failure to Manage Construction Camp Wastes and Fuels

107. Proper management of construction work camps, maintenance and storage areas is often a serious compliance issue. Impacts associated with inadequate waste management, poor fuel handling and inadequate site rehabilitation on completion of the work will be mitigated by the contractor taking five specific steps to make sure that none of these problems become an issue. These actions include the proper handling and management of all fuels and petroleum products (mitigative action no. 2.13 in Annex Table 1A provides details) proper handling and disposal of sewage and garbage and finally environmentally safe decommissioning of the any temporary work area to near-preconstruction condition.

5. Poor Management of Asphalt and Concrete Production Process

⁸ The donors and MOTC are discussing the establishment if a Project Management Consultant (PMC) to carry forward all implementation and monitoring of the entire multi-donor project with a view to training a national agency to take over all functions. Safeguards monitoring would be such a function since the existing system is non-compliant with any international standards and as such final approval of safeguard cannot be given.

108. Large quantities of bitumen will need to be handled and one or two mobile asphalt plants established. Careful plant siting and bitumen handling and storage procedures will be a major mitigation task. Spills and sloppy handling of the bitumen must be avoided. Further, concrete batch plants will also be established, generating dust and noise. Both pollutants must be managed, particularly cement dust, as it contains Chromium +6 a highly carcinogenic form of this heavy metal. Batch plants will need to have dust suppression equipment installed and noise will be controlled by limiting operating hours and locating the plants at least 3 km from any settlement and at least 1 km from any water course. The MOTC or its PMC will ensure that this happens.

6. Construction Period Air Pollution

109. A constant complaint by local populations near construction operations is local air pollution stemming from improper fleet maintenance, overloading of vehicles, inadequate diesel generator maintenance, poor dust suppression, excessive vehicle speed and the habit of keeping vehicles idling when not in use. To minimize that six actions are specified in the EMP, which the contractors and all their sub-contractors will be required to follow.

7. Unacceptable Culvert and Bridge Replacement and Repair

110. For Road Sect. 3 and 6 all existing 90 culverts and 13 bridges will need to be replaced. This means a good deal of work in and near water courses, the potential for siltation, chronic erosion and flow blockages and obstructions during runoff periods. To reduce the likelihood of problems arising from faulty construction a short safeguards advisory note has been prepared and is included as Annex 4.

8. Excessive Tree Cutting

111. Since both road sections, particularly Road Sect. No. 6, have roadside shelterbelt trees, in some cases providing the only mature tree area for many kilometers around, the widening must avoid cutting as much as possible. Secondly, these trees, while maintained by the MOTC are considered protected and under the management of the Ministry of Agriculture's CFH, specifically the Zhambyl Oblast Territorial Office of CFH. During the detailed design a cutting plan will be prepared and approved by the Oblast CFH and included in the contract specifications.

112. Contractors will be required to limit cutting and pay strict attention to the detailed design measure which will propose ways to reduce the loss of these trees through creative options such as designing shelterbelt road sections where the carriageway width is reduced, etc. Contractors will be required to confirm cutting plans with the Oblast office of the FHC.

4.1.3. Operating Period Potential Impacts

113. At least four significant impacts and one program-level inaction could lead to serious future problems. To prevent and/or mitigate the predicted effects a number of actions will be required; are described in Annex Table 1A and summarized in this section.

1. Inadequate Preparation of the Post-Commissioning Project Audit

114. As a requirement under the environmental assessment law of Kazakhstan, all large projects require a full compliance audit 1 year after operations begin. This audit examines all elements of the project and matches specifications with what was actually done. To properly audit environmental safeguards, the auditors will use the EMP as the base guide and confirm that each item was completed. The output will be a checklist report. Should any non compliance issues be found, immediate corrective actions will be taken by MOTC and if problems are for the

construction period, final payment to the contractor will be withheld until compliance is confirmed.

2. Air Quality Changes

115. The improvements of the road surfaces and widening will improve the flow of traffic, reduce deceleration- acceleration cycles and idling periods, therefore leading to the overall reduction in the emission levels, despite an increase in the overall traffic volume. The expected annual growth in traffic will be 6% after construction is completed, or a 2% generated and diverted traffic increase over pre construction levels. Not enough to be significant project-related emission.

116. Further, since existing vehicle speeds exceed the posted speed limit of 90 kph by 30-40 kph, the improved roads will affect safety concerns but only marginally increase emissions. Trucks on the other hand presently travel at 50-70 kph, well below the posted limit. With the improved roads this will change and emission from trucks, primarily TPM and SO₂ and Soot will increase by 2-5% within the road corridor airshed. This can only be controlled by enforcement of speed limits.

117. Buses are a group on their own as they seem to speed at all times and emissions are not expected to change beyond normal growth figures. The improved road will not change the driving pattern of the bus drivers.

118. Kazakhstan's 50m roadside use restriction should be enforced to help deal with the localized air pollution. The construction of bypasses will further improve conditions in towns and will reduce truck traffic through the densely populated areas.

119. The alarmingly high NO_x estimates, based on the CREDOC model, will be verified through field measurements during year 1 of the operating period and if consistent with the existing data, the annual vehicle inspection program for all vehicles overseen by the police and MOTC will be strengthened to make sure that NO_x emissions are kept in check through proper vehicle maintenance, particularly trucks and buses. The issue of better refining is a much more difficult challenge which the GoK is now working to resolve through a refinery modernization program.

120. Finally, should Kazakhstan continue to use leaded petrol, lead contamination of roadside soils and airsheds will continue to grow.

3. Noise Issues

121. Traffic analysis suggests that the annual increase without the project will be about 4% per year and therefore noise levels will continue to stay more or less the same for many years since an audible rise associated with a 3dBA change occurs every time there a doubling of the traffic or a large shift in the fleet composition. Considering both generated and diverted traffic, a project-related traffic volume increase of only 2% per year is expected, making project generated noise a non issue along these sections. Given the proposal for bypasses at Kulan and Merke, noise levels should drop in the more populated urban areas.

122. The existing noise projections do show high existing noise levels close to the road, therefore a careful monitoring of any attempts by people to live close to the road edge will be undertaken and the GoK's 50m rule for Class I and II roads, restricting any use of this corridor for all but road-related activities, will be enforced. Beyond 50m the noise predictions indicate levels at or below 65 dBA.

123. The actual data collected during the final EIA (to be completed before December 2008) will establish the real conditions and if the same as in the PEIA no further action will be needed. If standard exceedences are recorded, a noise monitoring program will be needed covering sensitive sites within 150m of the road, focusing on schools, hospitals and any quiet zones. Noise levels at night will be carefully monitored (although data suggest that there is little traffic at night).

4.1.4. Special Measures

1. Recognition of the Tian Shan Mountains Steppe Ecosystem and Flyways

124. The project area has no known identified protected species, habitat or any flora and fauna needing protection. These preliminary findings will be confirmed during the EIA being conducted by the GoK. However, the area in general is comprised of wet and dry steppe and foothills bordering the Tian Shan Mountains, with a rich biodiversity and needs to be conserved given the existing level of agricultural development. All construction work, particularly the establishment of any new aggregate sites, will require permitting and clearance by the Oblast authorities in charge, including the Territorial Office of the FHC, and must be confined to a small area as possible. Given that the project areas, particularly Sect. 3, is inside at least two major bird migration routes and the area is a resting and feeding site, prior to any excavation, contractors will be required to meet with local land users to establish if the area is used as a migratory bird resting and/or feeding area. No excavation will be permitted if this is the case and alternate sites will be established. The MOAg's Forest and Special Natural Protected Areas Department in Taraz will be consulted to ensure that the construction activity has the smallest impact possible on this ecological feature.

4.2. The Environmental Management Plan (EMP)

125. The EMP, consisting of mitigation measures matched with a set monitoring actions, is provided as two matrix tables (Annex Table A-1 and A-2). Both mitigation and monitoring measures are presented according to the three project development stages, i.e., preconstruction, construction and operations, since distinct impacts tend to reoccur regularly at each of these stages.

126. The tables are self explanatory and will be used not only by the contractor(s) to prepare their CEAPs but also by the team writing the bid documents, to make certain that all measures are reflected in the environmental clauses legally binding the contractors to undertake them.

127. The overriding responsibility for the project will rest with the MOTC, its Zhambyl Oblast office and the PMC. They will receive all reports and undertake any necessary disciplinary actions for non-compliance.

128. During the pre-construction period the day-to-day responsibility for mitigation will rest with either MOTC's RC or the PMC and the team undertaking the detailed design.

129. During the construction period the contractor will have to prepare the CEAP as defined in the EMP, and provide quarterly progress reporting to the MOTC/PMC. A second key responsibility will lie with each *Contract Supervising Engineer*, who will need to certify all reports and materials prepared as part of the mitigation and monitoring activity. Reports will be submitted by the *Contract Supervising Engineer*, to the Safeguards Unit of the MOTC/PMC⁹.

⁹ Given the size of the project a safeguards unit will need to be established within the PMC or formed by the RC, or the Oblast DOE Inspection Department will need to be strengthened and given a new mandate to monitor according to international standards.

Each contractor will prepare an end-of-construction monitoring report for use by the PMC or MOTC for the 1yr Post Commissioning Audit.

130. During the operating period MOTC and or the PMC will be responsible for not only implementing but also ensuring that all mitigative actions, monitoring and reporting takes place according to the general schedule defined in the EMP.

131. The safeguards unit's responsibility will be environmental oversight and quality compliance monitoring. At any time in the work program, they will be able to conduct spot audits using the EMP, and determine compliance and enforce immediate remedial actions.

132. The GoK's monitoring process, as presently defined by law, conflicts with the monitoring required by the ADB, and as such the MOTCs Safeguards Unit will be established. Detailed discussion of this issue is presented in Chapt. 6 of the IEE.

4.3. Social Impact Assessment and Resettlement

133. Based on the resettlement investigations there are no private land acquisition and resettlement issues for Road Project No. 3 and 6.

4.3.1. Community Perspective

134. The project should benefit the local communities by reducing traffic through urban areas and improving the access to services at major centers, by significantly reducing travel time.

4.3.2. Economic Impact

135. Despite the loss of traffic due to the construction of bypasses, the general economic impact will be largely positive, with road upgrading leading to more reliable and faster traffic movement.

4.3.3. HIV/AIDS

136. The road upgrading is expected to generate an additional 2% traffic, mostly diverted from other roads. Therefore there will not be a new pool of potential HIV/AIDS problems.

4.3.4. Poverty Impact

137. The impact on poverty is expected to be positive during construction as local labour will bring additional revenues to the towns where roadwork is taking place. In the long term no significant negative or positive effects due to the road are predicted.

5. Environmental Tools For Use with Multi-tranche Financing Facility(MFF) Loan

138. An MFF loan triggers two special ADB safeguard requirements; the preparation and use of an EARF and the completion of an MFF level cumulative impact assessment (CIA). To that end an EARF and a CIA Guide and Terms of Reference (CIA) have been prepared as two separate documents

5.1. The Environmental Assessment and Review Framework (EARF)

139. The EARF is the borrower's guide to multi-donor environmental assessment.

140. The EARF is to be applied to all donor projects which use the MFF modality; the World Bank with two Projects, the EBRD with two and the IsDB with two as well.

141. The EARF is a guide on how both IEE and EIA level assessment are to be planned, carried out, documented, and approved under the multi-donor specifications, which in a number of instances exceed or actually conflict with the GoK's norms and codes. The EARF specifies the process, presents a list of the common concerns and impacts associated with this set of projects and suggests a number of well known and frequently applied mitigative measures to deal with these impacts.

142. The EARF also presents a comparison of the Donors' and GoKs environmental assessment steps and approval requirements and an assessment of the institutional needs for strengthening EIA skills.

5.2. Cumulative Impact Assessment (CIA) Terms of Reference

143. The ADB loan will involve three Projects with a total of 7 road sections, all being undertaken less simultaneously. In addition there will be two EBRD projects, two IsDB projects and at least two World Bank project. The total loan will be around 7.8 billion dollars. Disbursing this loan will mean, contract packages between \$150 and \$200 million each, or between 40 and 50 contractors and an equal number of subcontractors all working at the same time. For the ADB portion totaling \$2 billion this could mean between 11 and 20 contractors (Projects I-III) and a number of subcontractors working in the same region and using the same resources, during the same time period.

144. In addition there are other development projects ongoing in the region during the same time period, requiring additional natural and human resources from the finite baseline.

145. The CIA will be used to focus these disparate effects and examine if there are serious negative (as well as positive) impacts result from all projects moving ahead at the same time, particularly to predict any additive and synergistic impacts. The CIA will try to find ways to prevent negative outcomes and enhance any identified positive effects.

146. The CIA Terms of Reference and budget have been prepared as a separate report and include a framework for undertaking CIA plus the ToR for doing this work.

6. Institutional Requirements, Monitoring and Costs

6.1. Institutions and Their Strengthening

147. Five ministries are directly involved in the EA completion and approval process. These are MOTC, MOEP, Ministry of Agriculture (MOAg) and Ministry of Health (MOH) and Ministry of Energy and Mineral Resources (MEMR), with the latter three providing expert review and permitting advice to MOTC, the RC, as well as participating in the bid evaluation.

148. Within MOTC it is the RC that will be directly responsible for the two Project I road sections, and will be supported by the Oblast-Level Department of Roads. RC will rely on their own environmental expertise and MOEP Astana for advice and Oblast DOE for site monitoring and enforcement of safeguard requirements.

149. In Astana the RC safeguards capacity consists of a Scientific and Technical Council with general environmental expertise, which based on the IEE consultants observations, is not relevant for the type of work ahead. In examining the way in which GoK regulations (norms) and standards (codes) are used, it was established that the laws permit unlimited exceedances of the standards so long as payments are made. In other words, a road project may request a permit to discharge raw sewage from work camps into local water courses even though it is not

according to the code, but due to the norm governing exceedance payment, the contractor can pay and continue to pollute. Therefore it could be said that any environmental safeguard standard can be exceeded with only money as the limiting factor. Unfortunately this was the position taken by Zhambyl Oblast authorities involved in the EIA implementation process. *The problem arising is that this approach to enforcement is not compliant with donor requirements and as such loan processing cannot proceed without change.*

150. Further, there is the looming problem concerning the monitoring function, since under GOK rules the entire monitoring process is non-compliant with even basic good international monitoring practices. The major problem is with the need to give contractors 2-weeks notice and the restriction on the number of inspections per year. Most internationally accepted monitoring procedures provide unencumbered site access without prior notice.

151. A review of GoK's strengths and weaknesses in relation to ADB safeguard requirements indicates the RC and its Oblast department, as well as the MOEP, contractors and their environmental specialist will need considerable strengthening in EMP implementation oversight and compliance monitoring and reporting.

152. A training and a separate policy workshop/dialogue with a goal improving the monitoring capacity will be planned and delivered by international specialists working with MOEP's Institute for Ecology and Climate Research, and as many national experts as needed. The details will be prepared by the PMC or oversight consultant assigned to help implement the Project 1 loan.

153. Additional training and assistance will be required, including the policy dialogue on the revisions to the norms governing monitoring procedures and the process of compliance with standards; bringing the GoK's approach in line with international good practice. In order to meet ADB requirements, the training workshop and policy assessment meetings need to be undertaken during the detailed design period. Since the processing of the loan is contingent on the monitoring and compliance unrestricted and un-announce monitoring, the MOTC will devise a means for the completion of this monitoring. One suggestion being explored is the establishment of an internal MOTC monitoring unit that undertakes unannounced audits and if problems are found files a complaint with the official monitoring department and an audit sanctioned by the Chief Prosecutors office can proceed—should the MOEP's Territorial Inspection Unit wish it.¹⁰

154. The total cost for these two sessions is estimated to be USD >15,000, assuming that participants pay part of their expenses. Another USD 8,000 has been budgeted for the policy dialogue activity.

155. The requirement for contractors to prepare their own CEAP's as well as monitoring methods, etc, will be difficult to achieve given the existing level of expertise in the country. To address this gap a Int'l. safeguards specialist will, at the start of the construction period, work with the contractors to assist with the preparation of credible CEAPs. The cost of this is estimated at USD 24,650.

6.2. Monitoring

156. A monitoring plan (Annex Table 1B), mirroring the mitigation plan, has been prepared for direct use by the proponent and the contractors. It was observed that monitoring, based on

¹⁰The MOEP's Territorial Inspection Unit is under no legal obligation to actually follow up a complaint made by the MOTC.

acceptable international practice and as defined in the table, cannot be undertaken under existing GoK rules, since the ADB process requires unencumbered and unannounced inspection of any operations and powers of enforcement and work stoppage if serious non-compliance issues are found. The monitoring plan has therefore been prepared with the assumption that either the regulation will be revised or that a PMC will undertake the monitoring using a new independent authority.

157. Under normal circumstances the preconstruction monitoring will be done by the MOTC and its Detailed Design Team (likely KAZDORPROEKT) to ensure that planning activities are completed to prevent negative impacts from taking place.

158. Construction period monitoring will likely be completed by the RC or the PMC as well as the MOEP Oblast Territorial Office Inspection Unit in Taraz. The PMC's reports will be forwarded to MOEP as well as MOTC, while the Oblast MOEP's inspections will follow a specific route of MOTC and MOEP. Any non-compliance issue will be addressed on the spot by the PMC inspectors¹¹ as well as by the MOEP inspectors.

159. During the operating period monitoring will be undertaken by the PMC or RC representatives. Monitoring will be completed to ensure that the five mitigative actions defined in Annex Table 1B have been implemented and that the 1-year post commissioning due diligence audit has been undertaken and that a report and any actions have been recorded and signed off on. This means that the operating period monitoring will extend over the first two years of operation (this could be longer if noise measurements indicate future problems).

6.3. Mitigation and Monitoring Costs

160. The total mitigation and monitoring cost for the Project I sections (Table 10) is estimated to be USD 1,213,267. This cost includes all mitigation, monitoring and capacity building and expenses for the 6.5 year duration, assuming that all items referred to as environmental fall under this budget. A major extraordinary cost is the overall soil-lead contamination testing and management program for a total of USD 237,925 and the noise monitoring at USD 87,100 plus per diems. Should the soils testing conducted during the detailed design stage show only minor contamination, much or all of the remaining USD 199,125 in fees and costs plus USD 196,125 in per diems, for a total of 392,250 targeted for work during the construction and operational periods will not be needed.

161. Further, the MOTC has commissioned the preparation of 7 separate detailed EIAs for the ADB road sections, and has said that these will be completed, with approvals by December 31, 2008. If these EIAs, once reviewed by an ADB safeguards specialist, quantify the risks and indicate a low likelihood of problems the budget will be further reduced.

162. However, should the lead sampling reveal serious contamination, the excavation and removal costs will be more than USD 100,000/km. These costs are not included in the budget since no actual field data are available and there may be an option to excavation.

163. The NOx air sampling during the 1st year of operations will be undertaken to establish the scale of the actual problem in relation to the traffic volume and composition, and measures as defined earlier in this EIA will be implemented.

¹¹ PMC inspectors will be needed since the GoK's inspection system permits only 1 inspection per year. The contractor must be given 2-week notice before the inspection can take place. Contractor can be non-compliant 2X before being fined or shut down. Most contracts will be for 3 years or less.

7. Public Consultation and Information Disclosure

169. A program for consultation with the general public was initiated prior to the start of the field, but with little success since the permits required to conduct such meetings needed multiple approvals and a lead time of at least 3 weeks-exceeding the entire project field period. Secondly, the general public is not familiar with such consultations and will view them with considerable suspicion and not participate for fear of offending local official, primarily the Akim's office. True public consultation is a new concept slowly finding its way into the Kazakhstan public but given the existing administrative system, will take some time to receive acceptance.

170. However, two sessions were conducted. The first was a set of small consultations among all levels of the public sector, from village policemen to vice ministers and agency director generals, in this way gauging both public and private sector opinion. In total 15 such sessions, each with 1-6 people, were held in Taraz, along the road sections near Kulan, Merke, Almaty and Astana. The second was a more formal meeting held in Korday at the akimat office. Minutes of all meeting are available and the three most important ones are presented in Annex Table 2A and 2B.

7.1. Logistics and Delivery

171. Meetings were delivered via small information exchange sessions, mostly with officials ranging from district staff to Provincial Directors. The Korday meeting was presented by an MOTC consultant and the District Transport Department Official at the district office in Korday.

7.2. The First Session

7.2.1. Issues Raised

172. The following issues were raised at the meeting held in Zhambyl Oblast and in Almaty (Table 13). These are listed and the propose approaches to dealing with them

Table 13. Issues Raised and Proposed Actions at Consultations in Zhambyl Oblast & Almaty

No.	Issue Raised: including real and perceived environmental issues	Action to Be Taken
1	Preliminary Environmental Impact Assessment has been prepared in 2 months (no field work) with the help of the CREDO simulation model. All data on environmental pollution is simulated for preliminary considerations only.	Detailed EIA will be undertaken as required by KAZ law in order to being to bring environmental safeguards into compliance.
2	Problems with coordinating international organizations, public agencies (national-level and regional-level), and private contractors, involved with the project	Organize a clearer chain of command and better project collaboration/communication network
3	International/National level project management and reporting requirements will presuppose the limited environmental institutional capacities of oblast- and rayon-level public organizations.	Training and counterpart assistance for KAZ experts to be undertaken
4	Good quality detailed design documentation should prevent non-compliance issues.	The inclusion of mitigation items from the EMP of the IEE should help to address this issue
5	Contractor's compliance with environmental norms and cooperation with local public agencies.	Solid contract specification and appropriate monitoring and enforcement should significantly reduce this concern
6	The permit for planned environmental inspection requires several months of preparation and approval of oblast prosecutor's office.	The permit to intitiate the construction could delay the beginning of the work considerably, and to that end a fast-track process is suggested where a

No.	Issue Raised: including real and perceived environmental issues	Action to Be Taken
		team assigned to the project (given its nearly \$ 500 million size) and credibly process the permits (which included not only environmental permits)
7	Environmental inspection can be carried out on request in the case of formal application of complaint from the public.	For the environmental safeguard to be accepted by the donor the monitoring process will need to be revised to permit unannounced, unencumbered construction monitoring for as many times per year as needed
8	Contractor's compliance of rules and norms, and cooperation with local people through Rayon Akimat.	Contractor compliance will be improved by the inclusion of appropriate safeguard clauses in the contract document, such that if non-compliant the contract will have monthly payments delayed/withheld.
10	Merke small businesses (cafes and shops) along the existing road through town mostly likely will lose customers. However Deputy Akim does not consider Merke as a high risk area for resettlement or environmental problems during road construction.	Social survey of socioeconomic impact of the creating of a bypass and improvement to the road to the north of Merke in the local business needs to be completed, and if negative effects shown a plan of action prepared and implemented by 2010.
11	Deputy Akim raised a risk of construction and resettlement of highly populated area of mountain range between Zhambyl and Shimkent, and the importance of the local people participation.	Sections 3 and 6, comprising Project 1, will have no resettlement.
12	Mudslides and flooding of season rivers	This will be an important issue in Section 4 and 5 but to date no indication this this is an issue along Section 3 or 6.
13	Erosion of in mountain areas	Same as above
14	The project required cooperation of Oblast Meteorological stations and Environmental Inspection agencies in the region.	As part of the proponents effort to improve collaboration among the specialist agencies , KAZHYDROMET needs to be included

is presented. The mitigative actions suggested in Table will form the basis for all actions to be taken.

173. Along section 3 before Kulan, a policeman working the local radar trap was interviewed and revealed that in general the people of Kulan welcomed the bypass and indicated that despite knowing they would lose business as a result of the traffic using the bypass instead of passing through town, the reduction of noise and air pollution was well worth that loss.

174. A second round of meetings was held in Astana, with all the specialist agencies as well as the MOTC. These results are also summarized and presented in Table.

7.3. The Second Session

175. The second session held in Korday consisted of the presentation of the IEE results to the group of approximately 30 people assembled—focusing on the EMP and its mitigation and monitoring measures.

7.3.1. Issues Raised

176. The following issues were raised at the consultation session held on Korday (for details see Annex 2B).

Issue Raised: including real and perceived environmental issues	Actions to Be Taken
Tree removal program: whether old trees and shelter belt plantings along roadsides will be liquidated?	According to the technical description of road reconstruction on unit 6, provided by Zhambyl Oblast Territorial Road Department, trees located very closely to the road will be removed and replaced by replanting young trees of the same species.
How much will be widened the existing road? Will the existing carriageway be wider, on how many meters exactly?	The improved road will have 15 m width, carriage way- 7,5 m, shoulders- 3.7m each, RoW– 40 m, etc.
Road reconstruction inside Korday village: where and what exactly will be done?	Roads inside Korday village, as well as pavements, pedestrian zones and traffic lights create big concern of local people. Improvement of pavements and establishing new traffic lights are very much needed currently. If unit 6 connects Korday with Blagoveschenka, people do hope, that roads inside Korday village will be repaired, too.
Contractors will not be forced to apply mitigation measures the will cause a lot of damage	Better enforcement and reporting with oversight by ADB
Contractors will not consult with local landowners before commencing work	Pre-construction protocol defined in EMP and will become the contractor's guideline.

177. Interestingly little was said regarding the lead or NOx issues raised in the IEE. Local officials expressed concerns that graveyards along the road not be disturbed. Since all such areas are well outside the road RoW there is on such danger. Overall the akimat and lower level official attending the meeting expressed concern that consultation(s) had not taken place earlier when MOTC was defining the project corridor, i.e. before much of the design had been fixed.

7.4. Use of Consultation Results

178. The consultation results have been fully integrated into this IEE, the EMP and in the recommended actions and associated budget for the environmental safeguards program which will operate in parallel with the design, construction and operation of the roads.

7.5. Follow Up Program

179. At both sessions, the people consulted expressed some concerns that contractors would not be complying with EMP requirements and the government would enforce the rules. To address this concern, monitors will interview rayon-level officials during the construction period and address any complaints received. Similar interviews during the post construction audit will be included and contractors will be required to provide compensation where impacts were not addressed.

8. Conclusions and Recommendations

180. The following are the conclusions and recommendations, relying on PEIA data and consultation information and reflect the need to meet ADB environmental safeguards.

181. The two sections within Project 1 do not present difficult engineering or design issues and no likely environmental impacts that cannot be prevented or adequately mitigated. The problems come with the level of confidence of the available data, primarily the PEIA and the experience of all stakeholders with donor safeguard requirements. In addition to the finding that the PEIA results are pure modeling output lacking any verification, a more careful examination

revealed many internal inconsistencies suggesting something was wrong with the input data and the assumptions used. Just one example is in the roadside air quality modeled using traffic volumes. Road section 6 yielded almost no roadside air pollution while Sect. 3 with less than half the traffic volume had several parameter exceeding standards to a dangerous level. This has raised serious doubts on the overall validity of the PEIA outputs.

182. To counter this problem, the MOTC has commissions 7 full EIAs, one for each of ADB-funded roads. For Project I Road Sections 3 and 6, the Kazakh EIAs will include robust mitigation and monitoring plans and be fully verifiable according to international safeguard standards. They will be used to supplement and adjust the IEE as needed.

8.1. Process and Policy Issues

183. The PEIA is not only technically limited, but seems to use inaccurate input data, making the output very general. This is particularly true for air, noise and water quality data.

184. The full EIA, which is needed before the project can receive approval under GoKs process, has not been started, while at the same time the detailed design is scheduled to be finished by the end of 2008 at which time the bid documents will be nearing completion. Should this schedule be maintained, the bid documents will be prepared without the benefit of a complete EIA and its Environmental Management Plan. To avoid this, the EMP included in this IEE will be used to guide preparation of environmental contract specifications.

185. GoK standards seem to be used not as absolutes to protect the environment, but rather as levels above which pollution is permitted so long as adequate payment is received (as it was explained by the Inspection Division of the DOE in Taraz). Therefore, it is questionable if any standards really end up protecting the environment. Clearly this must change and MOTC will enforce standard as levels established to protect the biophysical environment and people from serious negative effects, leading to costly mitigation or worse chronic negative impact. MOTC will instruct its monitors to strictly enforce the standards and not permit exceedences, unless authorized in writing by the Project Engineer.

186. GoK's Ecological Law and related regulations stipulate that environmental monitoring can only take place after a request has been filed and approved by the Chief Prosecutor's Office and the contractor is given a 2-week notice before any audit can begin. Further there is a one-per-year limit on inspections, unless special circumstances arise, and contractors are allowed two failed inspections, after which they are fined. Since most contracts are 3 years long, the contractors have little to fear from compliance monitoring. In other words compliance monitoring, according to existing GoK rules is unacceptable under donor rules. An amendment to these norms is urgently needed if safeguard standards are to be met¹². MOTC will organize a policy discussion to resolve this problem.

187. Further, the ADB requires project implementation report every 6 months. These reports will include an environmental section and therefore monitoring will be necessary.

¹² Contractors are required to submit quarterly safeguards monitoring reports to the Oblast MOEP. MOTC can undertake unofficial audits at any time and if issues arise, file a 'compliant' triggering an MOEP investigation (however at the discretion of MOEP). This is based on a recent addition of a sub-regulation to the Ecological Code (Law) of 2007, but remains unvarified.

8.2. Technical Capacity

188. Kazakhstan has highly skilled technical experts, who have spent their careers, following norms (there are >120 related to environment) and standards without much question. The skills of interpreting results and relating them to standards and norms are only marginally available. Credible environmental assessment output which requires such skills, points to a need for training in EIA methods. This would include training via case examples and counterpart work in a) provision of preventative environmental design, b) practical mitigation; c) establishment of adequate feedback mechanisms through clear and functioning monitoring and d) enforcement and reporting.

189. Kazakh experts do not understand these elements well, and having to find their way through a minefield of often conflicting and restricting norms and standards, the thought process is not about reasoning and possibilities but rather on how can the project not fall afoul of a norm and/or code, etc.

190. In addition to workshops and an environmental policy revision session, the capacity building should focus on learning by doing, where Kazakh specialists are partnered with an international specialist or a Kazakh who has been trained and has practiced outside Kazakhstan.

191. Contractors will not be left out of the training loop and to that end assistance with the preparation of CEAPs will be provided by an international safeguards specialist once contractors are ready to mobilize.

8.3. Significant Environmental Issues

192. Lacking reliable data on pollutant levels a number of issues need to be addressed in full.

8.3.1. Lead from Petrol in Roadside Soils

193. Both roads will be widened and as such the shoulder areas will need to be excavated and material transported, deposited, etc. The PEIA modeling data suggest that these roadside soils have lead levels 10-20 times above acceptable GoK standard. The modeling results further indicate that these levels exist 30-40m from the edge of the pavement. At the same time this zone is used by local farmers to graze their goats and sheep. No doubt the milk is used in the dairy industry and the meat is consumed. Some vegetables and cash crops are also grown in this zone. There is a danger that roadside lead is getting into the food chain.

194. For the past 30+ years the dangers of lead have been well known and very small concentrations are known to permanently affect mental and motor functions in humans, particularly children.

195. The excavation of these shoulder areas (there will be more than 75,000 m³ of this material to be handled) during dry periods, could easily transfer the lead into the air attached to dust particles, leading to a greater likelihood of lead poisoning.

196. To address this problem a program of soils, milk and food testing along the road is planned during the detailed design stage. Should contamination be found, a handling and treatment protocol will be undertaken during the construction period and local users will be warned of the dangers. The GoKs 50-m exclusive use rule for Class I and II roads will need to be enforced as well.

197. Given the high lead levels predicted for the roadside soils, contaminated surface waters and local groundwater is likely. Despite this high risk there is no mention of it in the PEIA.

198. The continued use of leaded fuels will only increase the soil and airshed lead pollution, threatening the health future generations.

8.3.2. NOx

199. Should NOx also prove to be as large an issue once actual field sampling is done during Yr. 1 of the operating period, MOTC will push toward a better enforcement of the vehicle and emission inspection programs. Further the government is advancing in the modernization of its refineries, therefore improving the quality of diesel fuel.

8.3.3. Construction and Operating Period Noise

200. Noise data from the PEIA suggest marginal issues and minor non-compliance, when applying the single 70 dBA standard (as suggested in the PEIA). Problems were thought likely when during the field period a) excessive noise levels were disturbing people in towns and villages and b) the model's noise outputs for Road Section 3 were significantly higher than for Section 6, even though traffic volumes for Section 6 were twice that of Section 3. These gaps mean that the MOTC will undertake an operating period noise monitoring program at sensitive sites (where the road is within 30m of residences, schools and hospitals) along the two roads for at least one year of operations (see EMP for details).

201. Construction period noise is less of an issue assuming that monitors can check compliance with requirements defined in the IEE's mitigation and monitoring plans.

8.3.4. Work Camp and Maintenance Yard Good Housekeeping

202. Management of construction camps, maintenance yards, asphalt plant and concrete batch plant sites is often very badly done, primarily because there is no inspection and enforcement. To avoid this, a set of measures designed of controlling waste and fuel pollution and to ensure proper operation and decommissioning of contractor and subcontractor managed sites, will need to be undertaken and enforced through regular quarterly unannounced inspections. If non-compliance is found the inspections will increase and fines will be levied.

8.3.5. Aggregate Site Development and Operations

203. Widening and raising the vertical alignment of the two roads means a lot of fill material for the sub-base and rock and aggregate for the asphalt and concrete surfaces.

204. To date there are few data on where the rock will come from , but it will likely be foothill quarries, with materials trucked or transported by rail to the crushing plants.

205. The existing process of locating a new source of aggregate is a matter of location on a geological map and choosing the location closest to the work. Under GOK rules there is no mandated screening of sites to establish any environmental limits and there is little concern for local landuse¹³. Usually people accept money without understanding the real consequences of such actions. To reduce these problems a process of screening is proposed, including discussions with local akims and local land users to determine the existing use of the aggregate

¹³ There is an unofficial requirement of the contractor to undertake an environmental screening of any proposed aggregate operation and present such findings with the application to open and operate such a site, but this has not been confirmed nor has there been any record if such a screening have been done.

sites and make sure that these locations are not important for the natural environment and at least they are out of the line of sight from the road. For any aggregate site access road construction, safe use, maintenances and decommissioning will a basic requirement each contractor will have to comply with.

206. The inspection of the rehabilitation and decommissioning activity of each site will be a part of the mandatory 1-year post commissioning GoK audit.

207. The field and internet search revealed that the area running E-W between the road and the foot of the Tian Shan mountains is crossed by at least three bird flyways, and as such various species could use these strip as a resting and feeding area on the way to and from the Siberian wetlands. Therefore aggregate site selection will have to include consideration for migratory bird resting area disturbance. Contractors will therefore need to consult the CFH's office in Taraz and consult with the person in charge protected natural areas.

8.3.6. Culvert and Bridge Replacement

208. The two roads will require the replacement of 90 or so culverts, many of these being large partially poured-in-place concrete box culverts, as well as the replacement and widening of 13 bridges. Working in and over water and along river banks can mean a great deal of damage very quickly. To help prevent this, guiding principles on environmentally sensible culvert and bridge reconstruction are provided in Annex 4 of the IEE. As a bare minimum, contractors will be required to adhere to the steps and will be inspected to check compliance.

8.3.7. Other Issues Found

209. Water quality data were so scarce that little could be said about the conditions along the road. The PEIA contained no water quality data other than a listing of standards. An examination of the KAZHYDROMET data on rivers in the area revealed that these data were being inconstantly reported. For example, data for obscure small streams were invariably available and indicated significant contamination, while large river data, e.g., the Shu River which is crossed by Road Sect. 6, had almost no data, but included a conclusion that its waters were mildly polluted. This is unusual also because it is common knowledge that all the sewage and most industrial liquid waste from Bishkek ends up in the Shu river, which is only 100km from where passes the KAZHYDROMET Shu R. sampling station at Blagoveshenka; and after receiving all sorts of effluents on the way.

210. Only copper, oil and phenol level data were available and they indicate contamination. Phenols were two times the allowable standard for human use, while all measurements exceeded levels for water used by fish and fisheries!

211. Fortunately, the road and bridge work is not expected to have significant impacts on surface water quality, as long as guidelines are followed and are enforced. However any construction induced pollution will be much harder to detect since there are no baseline data. To mitigate this MOTC has instructed the EIA teams to be sure to collect some baseline water, air quality and noise data.

8.4. Recommendations

212. Assuming business as usual in relation to monitoring and the use of standards, the environmental safeguard requirements for the project will remain non-compliant. The completion of EIAs, including field data etc. and favourable reviews by the Bank, will go a long

way to bringing the Project 1 safeguard conditions and their management into compliance with international norms.

213. Mitigative measures as defined in the EMP will be translated into a CEAP by the contractor and strictly implemented. Standards cannot be 'reduced' through penalty payments.

214. MOTC will plan, facilitate and participate in the training and policy dialogue tasks defined in the EMP, since without this, little progress can be made with any of the other key actions.

215. During the preconstruction period the MOTC will implement the road shoulder soils and food lead testing program and establish if there is a problem with lead contamination along roadsides and if so take immediate action as defined in the IEE and as recommended by the SES of the Kazakhstan Ministry of Health.

216. MOTC will provide the services of a senior international safeguards specialist to assist the contractors with the preparation of their CEAPs and help design their monitoring forms and reports (assuming that the quarterly reporting requirements is valid).

217. The MOTC will undertake regular unannounced audits of all operations and submit reports for review by the MOEP and ADB at any time.

218. Non-compliance during any stage of the project will be dealt with swiftly and fairly, with a view to fixing the problem instead of undertaking a police action.

219. Therefore as present conditions stand, the project remains marginally compliant, with a number of large overarching conditions needing to be dealt with. A passing safeguards grade is contingent on the conditions and actions as defined in Section 8.3 and in the EMP (Annex Tables 1A and 1B) being implemented, with a guarantee of unencumbered compliance monitoring, rapid reporting and swift actions to rectify any non-compliant items¹⁴. Completed EIAs, reviewed and signed off on by an int'l safeguards specialist, and a revised IEE EMP based on these documents would go a long way toward meeting the conditions.

220. Only when this is completed will Project I projects meet ADB safeguard requirements, and MOTC is committed to making this happen.

¹⁴ During meetings in Astana, a way around the requirement for inspection permits from the Chief Prosecutors Office and the 2- week notice to contractors was proposed. MOTC will retain a Project Management Consultant for the ADB contracts and a number of environmental inspectors (if there are 7 contracts, there will be three inspectors) could work under this unit conducting inspections as needed, but not before being provided adequate training in methods and reporting acceptable to donors. Each contractor would be required to have at least one person with environmental mitigation training on site at least monthly.

**ANNEX TABLE 1A AND 1B
ENVIRONMENTAL MITIGATION (TABLE 1A) AND MONITORING (TABLE 1B)**

Appendix Table 1A. Environmental Management Plan: Mitigative Measures

Environmental Impact/Issue	Mitigative Measures	Location ²	Time Frame	Responsibility	
				Implementation	Supervision
1. PRE-CONSTRUCTION PERIOD					
1.1 Lack of any capacity to understand and implement environmental mitigative measures	MOTC will operationalize the Environmental mitigation and monitoring measures as defined in the IEE and provide the necessary instructions to the contractor and the oblast level agencies responsible and conduct such a session either in Almaty or Taraz	In Taraz or Almaty	Within 1 week of the start of contractor mobilization	Specialists from within the PMC or retained experts to plan and deliver this training	Project Management Consultant (PMC) and the MOTC Roads Committee (RC)
1.2 No provision for translation of IEE and related documents for use by Oblast Inspectors, and for use in Bid documents (at least the EMP)	MOTC RC will provide the successful contractor with the translated IEE , including the EMP, with instructions on how the mitigative measures and monitoring are to be undertaken, making provision for assistance to the contractor in preparing the Construction Environmental Action Plan (CEAP). Secondly, the Site Engineer assigned will provide the DOEP inspectors with the EAI EMP and any supporting reports for use in their inspection process. Given the uncertainty of inspection qualifications MOTC and the PMC will organize 1-day workshop in Taraz field for technical inspectors to review environmental compliance monitoring and reporting, and fill any gaps arising from this session.	Not applicable As part of 1.1 a Workshop will be held in Taraz	Translate during detailed design stage and provide instructions prior to contractor field mobilization. To be determined	MOTC RC MOTC RC	MOTC RC MOTC RC
1.3 Bid documents prepared without access to or use of the IEE and particularly this EMP	No bid documents will be prepared without the authors have read and having a copy of the mitigation and monitoring plans found in the IEE. These tables plus sample environmental clauses together help formulate the safeguard clauses to include in the contract specifications.	Almaty	Before the bid documents for Section 3 and 6 contracts are completed	Detailed Design Consultant and MOTC Specialist	MOTC and PMC with advice from MOEP
1.4 Failure of designers to include design measures that will prevent later impacts such as: livestock crossing management, poor traffic management and excessive tree removal	During detailed design the design team will consult with MOEP-EEC team and develop best practice means for: 1. management of livestock crossing the road 2. minimizing the removal of mature trees from roadsides during widening operations; 3. planning for optimum traffic management during construction operations 4. provision of step-by-step guidance on environmentally acceptable bridge and culvert replacement methods	1. At any sites along Sect. 3 and 6 where crossings are frequent 2. At any locations where mature trees will be cut down 3. At all sites along an existing road 4. N A	1. Interviews with local people and shepherds 2. Initially at preconstruction planning and then prior to work starting in a treed stretch. 3. Continuous 4. Early in the construction period before any bridge building tasks place	1. Detailed Design team to visit field 2. Detailed Design team in consultation with Forestry and Hunting Committee (FHC) to prepare tree removal and replanting scheme for heavily treed sections of road, such	MOTC RC

Environmental Impact/Issue	Mitigative Measures	Location ²	Time Frame	Responsibility	
				Implementation	Supervision
				as No. 6 3. Transport Planners prepare a protocol. 4. Detailed Design Team with help of ecology expertise	
1.5 Failure to carry out a roadside soil testing program to establish lead contamination.	MOTC in cooperation with the SES of the Ministry of Health will undertake a roadside sampling program for lead, establish the distance from the pavement edge and depth of dangerous contamination including a treatment plan and map of locations and depths. Testing of products such as milk and foods such as lettuce melons and cucumbers derived from this area will also be tested. Testing will take place at least 6 sites on both sides of the pavement and replicated at least twice. These data will form a lead management protocol	Anywhere where roads shoulders are to be work in/on along the road	During the detailed design stage	MOTC and SEC of Ministry of Health	MOTC and RC
1.6 Failure to update environmental assessment document should there be last – minute alignment changes	For most environmentally sensitive projects, especially category A projects, major site selection issues should have been addressed by the time of Board approval. Where uncertainty exists about specific locations or alignments of major infrastructure or project facilities at the time of Board approval, the EIA or IEE must include an EMP that presents full details on the agreed process to be followed for environmental assessment, including any special studies of environmental issues and specification of environmental mitigation measures during project implementation. The pertinent details must be presented in the SEIA and summarized in the RRP. The details must also be reflected in the loan agreement.	For the entire project	During the Detailed Design stage	MOTC and RC	MOTC and RC
2. CONSTRUCTION PERIOD					
2.1 Contractor fails to retain a ecological expert to prepare the CEAP and to implement all mitigation and monitoring measures, leading to a failure to implement the EMP	As specified by law, contractor will be required to retain an ecologic expert with EIA experience to prepare the CEAP and obtain all relevant permits. The contractor will not be permitted to mobilize the workers without an approved CEAP and the appropriate permits in place	Prior to the start of the construction work.	NA	Contractor	MOTC and PMC
2.1A . Despite the 1.5 day workshop proposed in 2.12 ,	MOTC provides senior int'l. safeguards spec to assist contractors with CEAP and monitoring protocol and reporting format, etc.	Each contractor	Start of construction period once	PMC and Int'l Safeguards	MOTC and PMC

Environmental Impact/Issue	Mitigative Measures	Location ²	Time Frame	Responsibility	
				Implementation	Supervision
contractor lacks capacity to prepare key CEAP and related materials			contracts awarded	Spec.	
2.2 Improper management of earthworks transport and Storage procedures, including cleaning; leading to dust and air pollution (Also see 2.5)	Large volumes of quarry rock, aggregate and sand will be transported and stored in the airport work site. These operations and storage areas will be constantly exposed to the elements and will create primarily dust during the frequent windy conditions. Dust will be managed by daily use of watering trucks. All topsoil needs to be collected and reused to rehabilitate/revegetate the areas disturbed.	Throughout the construction period	Anywhere where there is material moved, earthworks cutting and filling	Contractor	MOTC and PMC
2.3 Inadequate erosion control and slope stabilization leading to land slip and chronic erosion at cuts and water crossings.	Contractor will be required to know the subsoil materials that are being cut into and excavated and have ready appropriate plans to stop land slippage and erosion, particularly in the valleys of Section 3. At water crossings where structures are to be replaced careful replacement and use of gabions with culverts and bioengineering methods for rapid revegetation and slope stabilization will be used.	Based in a analysis of soils conditions by contractor and consultation with KAZHYDRO MET	Throughout the construction period	Contractor	MOTC and PMC
2.4 Side borrow operations leading to erosion, landslide and destruction of landscape	While not strictly forbidden, the practice of taking fill material from the side of the road, creating a landscape of craters is not acceptable to MOTC and therefore should not be done, unless complete landscaping and erosion control follows. Any such borrow areas should not intrude visually on the road, meaning it should be out of eyesight from the road with proper site re-contouring and replacement of topsoil. The traditional method of scooping materials and leaving craters will not be permitted.	During construction period along any stretches where road will be raised and fill is needed, particularly in areas with long visual distances	Throughout the construction period	Contractor	MOTC and PMC
2.5 Failure to maintain the earthworks and materials handling process, including aggregate sites, haul roads to quarries/agg. processing sites including management of dust, noise, drainage during haulage of materials	Mitigation will involve <ol style="list-style-type: none"> 1. upgrading the haul road so it becomes an all weather road; 2. enforcing a speed limit of 30 KMP within 500m of any village and the use of chemical dust suppressants at least on road for 500m on either side of a village, Same approach is to be taken if the other site is used. 3. restricting operating hours through roadside villages and settlements to between hours of 0800 and 1730. 4. Aggregate sites will require permits and contractors will be required to mark the boundaries, work within them and fully rehabilitate and stabilize the site as part of decommissioning. 	1-3. All access roads and haul routes for materials movement, particularly through settlement areas, villages and towns 4. Define restricted locations as anywhere within a 1 km distance of a settlement area, with a preference	Throughout the construction period	Contractor	MOTC and PMC

Environmental Impact/Issue	Mitigative Measures	Location ²	Time Frame	Responsibility	
				Implementa tion	Supervisi on
		for sites downwind of settlements.			
2.6 Inadequate handling of lead contaminated roadside soils	Should the tests during the preconstruction period indicate consistently contaminated soils and these need to be excavated, the contractor must treat these soils as hazardous materials, seek proper disposal permits and get expert advice on how and where to dispose or decontaminate these soils.	Any road shoulders where excavation is planned	Prior to any road shoulder excavation or clearing	Contractor and SEC of the Min of Health as well as MOEP	MOTC and PMC
2.7 Failure to adhere to construction related good housekeeping practices, including solid and sanitary waste management	<p>Contractors will adhere to standard good housekeeping practices as defined in the contract Terms & Conditions and Contract Specifications. Special considerations will be given to</p> <ol style="list-style-type: none"> 1. management of construction waste and water 2. equipment lubricants and fuel, including management and collection of waste oils and fuel particularly related to refuelling depots, maintenance areas and diesel generator sets (See further details in 2.13) 3. Sewage will require latrines or chemical toilets with complete clean up after the construction is complete. 4. Garbage will be collected and properly disposed of after recycling and sorting, <p>This work will be completed in accordance with GOK norms and codes which the contractor will be expected to know, based on the completion of the CEAP. Also, the contractor shall orient all construction workers in basic sanitation and health care issues, particularly as related to ticks which carry in southern Kazakhstan carry encephalitis, general health and safety matters, and on the specific hazards of their work and will need to certify to that effect at the start of the construction period.</p> <ol style="list-style-type: none"> 5. Once the site is no longer needed the contractor must fully decommission it, with special emphasis on waste removal and clean up of any spills or hazardous materials plus any necessary revegetation. 	All work camps, construction maintenance yards and any other areas operated by the contractor and involved in the project	Throughout the construction period	Contractor	MOTC and PMC
2.8 Failure of contractor to manage bitumen/asphalt and concrete production facilities	Siting and operation of the asphalt and concrete batch plants will require permits, including information in sighting and environmental controls. The contractor will be required to locate an asphalt plants at least 1 km from any existing or old water course and at least 3 km away from any residential or commercial dwelling, preferable down-wind. Concrete batch plants will have the same limits and must have dust suppression	At bitumen storage area, particularly at mobile asphalt plants where bitument is loaded into boiler and heated for	Throughout the construction period	Contractor	MOTC and PMC

Environmental Impact/Issue	Mitigative Measures	Location ²	Time Frame	Responsibility	
				Implementation	Supervision
	equipment installed. Operating periods for such facilities will be 0700-1500 Monday through noon Saturday.	mixing			
2.9 Modification of surface drainage during culvert and bridge replacement and raising of horizontal road alignment without repair and rehabilitation after construction is finished	<p>When modifying or interfering with surface drainage of any sort the contract will have to undertake the following:</p> <ol style="list-style-type: none"> 1. All culverts must be sized at or larger than the one being replaced and with care about slope and erosion protection at inflow and outflow. All construction materials in the channel must be removed so as not to provide any obstruction. Culvert removal and replacement will be done when there is low flows or no water in the channel and during the dry months of the year. 2. Bridges will be repaired and widened and as such there will be machinery at least at the water edge. Maximum care is needed to avoid degradation of the river, stream shore and to undertake excessive excavation at the shore and in the water (at least not when there is water in the stream). Demolition must be done in a way that prevents large junks of material from falling into the river. Stabilization of disturbed crossing banks must take place as part of the construction work and include filter fabric, gabions and preferably bioengineering techniques. 3. Where roadways are elevated to reduce flooding, extra care is needed to be sure that all drainage channels have a means to get under the road to the other side. To achieve this the contractor must undertake a surface drainage inventory of the future raised road sections and map out where existing and needed new culverts are to go. There may be cases where old culverts need to be relocated. 	<ol style="list-style-type: none"> 1. At all existing culvert sites and where new culverts are specified in the design drawings 2. At all bridges which will need widening and repair 3. Along any road sections where vertical alignments are to be raised via the addition of fill material. 	Throughout the construction period	Contractor	MOTC and PMC
2.10 Excessive construction-period air pollution	<p>Emissions will be kept to a minimum by:</p> <ol style="list-style-type: none"> 1. ensuring that the contractor's fleet of vehicles are properly maintained and use acceptable fuel and haul loads within specified limits. 2. Vehicle idling time limits to no more than 2 minutes and 3. equipment maintenance specifications will be imposed through construction inspection and regular reporting, 4. Dust control at the construction site will be particularly stringently controlled by watering, setting strict 	Anywhere at construction sites where vehicles of the contractor or under the contractor's control (including paying for services), such as subcontracted trucks	Throughout the construction period	Contractor and all subcontractors as directed by the Contractor	MOTC and PMC

Environmental Impact/Issue	Mitigative Measures	Location ²	Time Frame	Responsibility	
				Implementa tion	Supervisi on
	<p>speed limits of no more than 30kph in an near settled areas, and clean up of paved haul roads.</p> <p>6. Equipment such as the diesel generator will be included in the emission control program and will be and regularly tuned to prevent excessive TPM pollution.</p>	hauling materials			
2.11 Loss of Cultural/Arch. Heritage, including cemeteries and roadside graves/markers of accident victims	<p>There are a number of roadside graves/markers of accident victims along sections 3 and 6 and are often located within a few meters of the carriageway. To move these will require a process of consultation with the local Akim as well as the victims family in order to move the grave to an appropriate site.</p> <p>Since all the work is basically in previously disturbed soil the risk of loss of historical or cultural relics is highly unlikely. However when widening roads in villages and towns, contractors will have to meet with local Akims to consult about any possible past relics or foundations of old buildings along the road. Any finds must be reported to the Oblast Cultural Heritage Department and all construction work stopped until authorities have inspected the site.</p>	<p>At any gravesites</p> <p>Within 200m of any town or village located along the roads to be widened</p>	<p>During the construction period and ahead of excavation at any such site</p> <p>Prior to earth moving in these areas</p>	<p>Contractor</p> <p>Contractor and Oblast Cultural Heritage expertise</p>	<p>PMC, MOTC and any needed help from the Cultural Heritage Expertise</p>
2.12 The lack of technical capacity in CEAP implementation and reporting leading to the collapse of the environmental safeguards tasks defined in the EIA and GoK Norms and Codes	The MOTC will hire a consultant to deliver a 1.5 day training workshop to the Oblast and Rayon level in Zhambyl Oblast government agencies involved and the contractor. Focus will be in the complete understanding of the EMP, the mitigation and monitoring tasks, responsibility of the stakeholders and proper documentation. Approximately 12-13 people will be involved, plus three people delivering the workshop.	Taraz	Prior to the start of construction but after the contractor has been named and has appointed an ecological expertise	MOTC-PMC and any specialized consultant	MOTC and PMC
2.13 Contractor undertakes an excessive and unnecessary tree removal program damaging the old trees and shelter belt plantings along roadsides	For each section of the road, contractors are required to develop a sketch map of the location number and species of trees along the roadside that are located within the area likely to be cleared. In areas where there are large trees creating a long green tunnel, designers will be contacted and alternative designs, such as narrowing the carriageway and transforming this area into a roadside rest area should discussed and an option found that requires the minimum tree loss. Any tree removed will be replaced by replanting several (>2) young trees of the same species.	Along any section of the road were trees are encroaching into the area to be cleared for widening	Prior to any clearing taking place	Contractor, with advice from the Oblast FHC	PMC and MOTCP
2.14 Failure to properly manage petroleum products such as fuel, lubricants and bitumen, leading to spill and	<p>Contractor will be required to have the following spill prevention measures in place at all work sites:</p> <p>1. all fuelling to be done on a concrete surface provided with spill catch tank that can be cleaned and all spilled fuel recovered and recycled based</p>	At any work camps, maintenance yards and any other areas that the contractor	Throughout the construction period	Contractor and all subcontractors as directed by the Contractor	MOTC and PMC

Environmental Impact/Issue	Mitigative Measures	Location ²	Time Frame	Responsibility	
				Implementa tion	Supervisi on
contamination.	<p>on discussions with fuel supplier.</p> <ol style="list-style-type: none"> 2. All repair and maintenance work must either be done on a concrete surface with oil spill catch basin or oil catch pans must be provided at all service areas and training provided to all 'mechanics'. 3. All fuel use areas where spills and leakage is possible, eg the generator, must have drip basins installed to prevent any leakage. These recovered materials must be recycled. 4. A fueling areas must be equipped with proper fuel nozzles 5. All fuel tanks must have means for containment of accidental spills. 6. All bitumen handling must not permit any material from leaking to the ground, including transfer areas and any areas where bitumen is transported in drums. 7. Bitumen drums must be stored in a dry covered secure place where no leakage to water or ground is possible. Drums must be recycled at least 1X/yr. 8. Any spills must be cleaned up according to GoK norms and codes within 24 hours of the occurrence, with contaminated soils and water treated according to GoK norms and codes. 	uses or subcontractor use during the construction period			
3. OPERATING PERIOD					
3.1 Inadequate management of traffic-generated air pollution	The improvements of the road surfaces and widening, will improve the flow of traffic, reduce deceleration- acceleration cycles and idling periods, therefore leading to the overall reduction in the emission levels, despite an increase in the overall traffic volume. The expected annual growth in traffic will be 6% after construction is completed, or a 2% increase over pre construction levels, not enough to be significant project-related emission.				
3.2 Inadequate management of Traffic related noise					
3.3 Inadequate control of roadside farming, leading to lead ¹⁵ contamination in such items as any	<p>The road operator will undertake a heavy metal testing of grasses and crops grown within 50m of the carriageway and establish lead and heavy metal levels.</p> <p>National roads have a 50m farming restriction</p>	At 20 sites with steady existing traffic and grazing and crop growing	This will be done at 20 random sites where traffic volumes are known and for	Operator, in collaboration with KAZHYDRO-MET	MOTC

¹⁵ Between 75% and 85% of gasoline powered vehicles in Kazakhstan still use leaded fuel

Environmental Impact/Issue	Mitigative Measures	Location ²	Time Frame	Responsibility	
				Implementa tion	Supervisi on
leaf crops, melons and milk from roadside grazers	zone and the road operator will enforce this where possible should the data suggest that there are problems. Lead levels will be estimated for future traffic conditions and contamination predicted and appropriate action taken	within 50m of the carriageway edge.	at least roadside soil as well as grass, and food crops such as lettuce, cucumbers and tomatoes grown near the road and milk of goats and sheep grazing along the roadside.		
3.4 Increased risk of pedestrian accidents due to improved roads, faster speeds and greater traffic volume	To manage these problems the operator will enforce speed limits through increased 'radar' surveillance, better and more frequent signage and increased speeding fines. In villages at crossing the owner will improve the signage and include amber lights were possible. As many town bypasses as possible are planned and should reduce project generated traffic through towns and villages.	In every village and town where the road will be upgraded	Planned during the detailed design stage and installed during the construction period then completed at the start of operations		
3.5 Increased risk of haz. materials spills due to increased traffic volume and provision of larger capacity bridges and stronger road surfaces, inviting large trucks to use the road.	Although the risk is extremely small since most such materials are transported by rail, the road operator will: <ol style="list-style-type: none"> 1. Insure that all trucks carrying haz materials are marked according to GoK norms and codes 2. Enforce speed limits for trucks carrying haz material to <= 85kph or according the the GoK norms and codes. 3. Restrict of all truck carrying haz material from passage through town and villages where bypasses exist; 4. Assist Zhambyl Oblast to prepare a rapid spill response and clean up protocol so that in the event of a spill the appropriate people and equipment are quickly notified and action can be taken. 	In Taraz	Within the first year of the road being in operation	Road Operator	MOTC and Oblast Transport Committee , with help from MOEP

Appendix Table 1B. Environmental Management Plan: Monitoring Measures

ITEM	Monitoring Details	Timing	Executing Unit	Reporting Responsibility
1. PRE-CONSTRUCTION (DESIGN) PERIOD: all written confirmation and reports submitted to MOTC and PMC with copies to Oblase-Env. Department				
1.1 Lack of any capacity to understand and implement environmental mitigative measures	Collect written material indicating that MOTC has provided instructions for the contractors to use to better use the IEE output	During Detailed Design Period	MOTC	MOTC
1.2-1.3 No provision for translation of IEE and related documents for use by Oblast Inspectors, and for use in Bid documents (at least the EMP)	Confirm that Kazakh/Russian version of IEE and EMP are with the Zhambyl Oblast Inspectors Confirm that bid documents contain environmental clauses tailored to the project conditions as well as a general set	During Detailed Design Period	MOTC	MOTC
1.4 Failure of designers to include design measures that will prevent later impacts such as: livestock crossing management, poor traffic management and excessive tree removal	Confirm by reviewing design documents and discussion with design team that 1) livestock crossings in Section 3 have been addressed 2) a plan to protect roadside trees as much as possible has been prepared; 3) There is step-by-step protocol for traffic management during construction (as opposed to ad hoc, hap hazard existing system); and 4) a environmentally friendly bridge and culvert replacement guide has been prepared	During Detailed Design Period	Detailed Design Team under the direction of MOTC	MOTC
1.5 Lead contamination of roadside soil testing program	Monitor to verify that soil and local food stuffs, particularly goats and sheep milk is tested for lead contamination and that a management protocol is being developed with the participation of the SES of the MOH.	During Detailed Design Period	Specialist consultant hired by MOTC	MOTC and SES of MOH
2. CONSTRUCTION PERIOD -prepare and use this section as construction monitoring checklist				
2.1 ecological expert to prepare the CEAP and to implement all mitigation and monitoring measures with contractor	Confirm ecological expertise is with contractor at start of construction period: obtain name and CV.	At time of contractor appointment	PMC	MOTC
2.1A. International Safeguards spec. helping contractors to prepare CEAP and monitoring protocol	Confirm that international safeguards specialist is on the job	Shortly after contracts awarded	PMC monitor	MOTC
2.2 Earthworks transport and storage monitoring	Undertake, as part of the construction inspection, regular confirmation that earthworks are handled in an environmentally acceptable manner and dust control is undertaken at all time, including the use of tarpaulins by trucks hauling fine materials, as well as watering and use of chemical suppressants along the haul road sections for 1 km at villages, AND THAT A SPEED LIMIT OF 30KPH IS ENFORCED.	Every day, throughout the construction period	PMC Monitor	PMC and MOTC

ITEM	Monitoring Details	Timing	Executing Unit	Reporting Responsibility
2.3 erosion control and slope stabilization TO PREVENT land slip and chronic erosion at cuts and water crossings is being applied.	Undertake regular inspection to confirm that slope stabilization and standard erosion protection method are being used by the contractor for all work where there is clearing of topsoil, cutting and filling	Every day, throughout the construction period	PMC Monitor	PMC and MOTC
2.4 Side borrow operations leading to erosion, landslide and destruction of landscape	Undertake inspections to determine the type of borrow operations the contractor is applying and ensure that roadside borrowing is not taking place and is always out of the visual field from the road.	Throughout the construction period and monthly	PMC Monitor	PMC and MOTC
2.5 Environmentally acceptable earthworks and materials handling process, including aggregate sites, haul roads to quarries/agg. processing sites ; managing of dust, noise, drainage during haulage of materials	Using a checklist confirm the following: <ol style="list-style-type: none"> 1. haul road upgraded so it becomes an all weather road; 2. speed limit of 30 KMP within 500m of any village and the use of chemical dust suppressants at least on road for 500m on either side of a village is enforced, Same approach is to be taken if the other site is used. 3. haulage through roadside villages and settlements is restricted to between hours of 0730 and 1730. 4. Aggregate sites are operating legally and contractors have marked the boundaries, work within them, and fully rehabilitate and stabilize the site as part of decommissioning. 	Start of Construction period and thereafter monthly until use of roads/sites is finished.	PMC Monitor	PMC and MOTC
2.6 Contractor is following protocol related to the excavation of roadside lead contaminated soils (See No. 1.5)	The excavation of every roadside area needs to be matched with reasonable proof that the materials are not severely contaminated with lead and/or Chromium and if contamination exists, confirmation of proper handling and treatment	At every shoulder excavation site, anywhere where lead contamination is shown to be high	PMC Monitor	PMC and MOTC
2.7 Contractor is adhering to construction related good housekeeping practices, including solid and sanitary waste management	Using a monitoring checklist, confirm that the items as listed in the EMP; Mitigation Measures Table: Item 2.6 [1-5] are fully implemented.	Throughout the construction period and monthly	PMC Monitor	PMC and MOTC
2.8 Preventing bitumen/asphalt and concrete production spills and pollution	Confirm that sighting specification for both asphalt and concrete plants are according to norms and codes but also that are at least as far away from settlement areas as defined in the mitigation table. Bitumen storage and handling is done without spillage	Throughout the construction period and monthly	PMC Monitor	PMC and MOTC

ITEM	Monitoring Details	Timing	Executing Unit	Reporting Responsibility
2.9 Monitoring of surface drainage at construction area	The PIU will inspect and verify that adequate consideration and drainage works and protection have been provided: specifically that the 3 mitigative measures defined in 2.9 of the mitigation table are fully implemented in a timely manner.	5X during the construction period, once to confirm that sites have been identified and 2X during each rainy season for at least through 2010.	PMC Monitor	PMC and MOTC
2.10 Controlling construction-period air pollution	Using a monitoring checklist confirm that the six mitigative actions defined in 2.9 of the Mitigation Table are being implemented	Ongoing throughout the project as part of the construction inspection	PMC Monitor	PMC and MOTC
2.11 Loss of Cultural/Arch. Heritage, including cemeteries and roadside graves/markers of accident victims	Confirm that all roadside graves (based on an inventory of sites) are dealt with in a dignified and legal manner including viewing records of consultation with Akims and with family members and reviewing the process being taken for check the possible presence of cultural relics.	Ongoing with specific checks each time a construction inspection takes place	PMC Monitor working with local authorities	PMC and MOTC
2.12 Contractor has provided the capacity for CEAP implementation and reporting as defined in the defined in the project EIA, GoK Norms and Codes and this IEE	Meet with contractor's ecological expertise and discuss all issues and to confirm experts period on the job throughout the construction period	At start of the construction period	PMC Monitor	PMC and MOTC
2.13 Tree removal program damaging the old trees and shelter belt plantings along roadsides kept to a absolute minimum	Inspection of cutting plan and confirmation of consultation with FHC and review. recording of re-planting/revegetation efforts	Throughout the construction period (quarterly) and before cutting is to start in densely treed sections	PMC Monitor on cooperation with the FHC of the Oblast and Rayon were cutting is likely	PMC and MOTC
2.14 Management of petroleum products such as fuel, lubricants and bitumen, without spills and contamination being practiced by contractor and all subcontractors.	Using the monitoring checklist the 8 specific spill and contamination prevention measures listed in item 2.13 of the Mitigation table will be assessed and reported on. Any non-compliance will be rectified immediately	Quarterly inspections at all work sites, work camps, diesel generators, maintenance yards and fuel and bitumen storage facilities	PMC Monitor	PMC and MOTC
3. OPERATING PERIOD				

ITEM	Monitoring Details	Timing	Executing Unit	Reporting Responsibility
3.0 Conduct the 1-year post construction operational audit	The owner of the road must organize and undertake a complete audit of the project. This audit is to be undertaken by the Oblast-level DOEP and for this the owner (MOTC will cooperate fully). Findings must be reported within 15 days of completion of the field inspection and actions to repair any non compliance conditions started within 5 days of notification by the Inspection Department. All such actions must be completed or be well underway within 30 days.	No more than 13 months after the operating period has fully started.	MOTC. And MOEP	MOTC and Oblast-level Department of Env. Inspection Unit.
3.1 Management of traffic-generated air pollution	Should traffic growth exceed the projected 2%/year monitoring at sensitive areas such as roadside towns and villages will be required	Monitoring 1X/year for 2 continuous 24 hour period during the non-winter season at 9 station for Sect. 3 and 3 stations for Sect. 6	MOTC in cooperation with KAZHYDRO-MET	MOTC
3.2 Management of traffic-generated noise	Noise is an existing problem in roadside communities, particularly during the peak traffic season from about April through October. The improvements are expected to marginally affect noise levels and in some cases reduce noise through the use of bypasses and enforcement of speed limits for trucks and buses. A smoother road will also reduce noise. However noise will be monitored at sensitive sites	Monitoring will take place 1X/year during peak traffic periods over 2 24 hour continuous monitoring periods at 9 stations for Sect. 3 and 3 for Sect. 6	MOTC in cooperation with Ministry of Health's Sanitary and Epidemiological Service	MOTC
3.3 Control of roadside farming minimizing the ingestion of lead ¹⁶ in such items as any leaf crops, melons and milk from roadside grazers— due to leaded fuels	Conduct a testing program to establish the lead levels in products coming from roadsides in the corridor. Goat and cattle milk is to be tested as well as crops grown within 50 m of the road, including lettuce tomatoes and cucumbers and melos. If the tests show dangerous levels, discuss the enforcement of the 50m-rule with MOTC and ensure that this or similar measure are being undertaken	Monitoring to be completed on milk and at least 3 products coming from plots within 50m of the road. Testing is to be done during the construction period at 10 roadside sites and for at least 3 animal heard known to use roadside pasture	MOTC working closely with the Ministry of Health's Sanitary and Epidemiological Service to establish the sampling design and with KAZHYDRO-MET for sampling program	MOTC

¹⁶ Between 75% and 85% of gasoline powered vehicles in Kazakhstan still use leaded fuel

ITEM	Monitoring Details	Timing	Executing Unit	Reporting Responsibility
3.4 Manage risk of pedestrian accidents due to improved roads, faster speeds and greater traffic volume	Traffic volume due to the project of 2% per year is not expected to affect the accident rate, however the increased speeding will and to that end signage and enforcement will be essential. bypasses will help considerably and restriction of bus speed in town will help. Aside from aggressive enforcement, the best method will be to significantly improve speed limit signage, highlighting school and other high pedestrian use zones, and provide more cross walk lighting.	Undertake annual safety check and review statistics of pedestrian vehicle accidents and address those areas where problems occur	MOTC working with Oblast and Rayon level authorities	MOTC
3.5 Reduce risk of haz. materials spills due to increased traffic volume and provision of larger capacity bridges and stronger road surfaces, inviting large trucks to use the road.	Using a monitoring checklist annual inspection to confirm the implementation of 4 mitigative measures as define in Mitigation Table item 3.5 will be required	Undertake an annual audit of these conditions and actions	MOTC working with Oblast and Rayon level authorities	MOTC

**ANNEX TABLE 2: RECORD OF CONSULTATIONS
ANNEX TABLE 2A: FIRST SESSION**

**I. RECORD OF ENVIRONMENTAL CONSULTATION AND INFORMATION DISCLOSURE
SESSION(S)**

PREFACE

A program for consultation with the general public and stakeholders beyond the public sector was initiated prior to the start of the field work by the national consultant but with little success since the permits required to conduct such meetings needed multiple approvals and a lead time of at least 3 weeks-exceeding the entire project field period. Secondly, the general public is not familiar with such consultations and therefore will view them with considerable suspicion and not participate for fear of offending local official, primarily the Akim's office. This was confirmed when attempts at ad hoc interviews on the street were greeted with polite nos. True public consultation is a new concept slowly finding it way into the Kazakhstan's administrative process, and given the existing system this will take some time to receive acceptance.

A large number of consultation were undertaken among all levels of the public sector, from village policemen to vice ministers and agency director generals, in this way gauging, at least minimally, both public and private sector opinion. Project 1 projects with no work outside the RoW, will not have serious environmental issues.

In total 15 meeting with 1-6 people each, were held in Taraz, along the road sections near Kulan, Merke, Almaty and Astana. Minutes of the five most important ones are presented in Annex Table 2.

**I. RECORD OF ENVIRONMENTAL CONSULTATION AND INFORMATION DISCLOSURE
SESSION(S)**

- 1. Projects under consideration including details on design, capacities, sighting etc.**
CAREC Transport Corridor-Terez-Merek and Blagoveschenka-Korday Road Sections, Zambyl Oblast
- 2. Meeting Location: *province, city, agency building-***
Almaty City, KazDorProekt (Road Design and Feasibility Study)
- 3. Meeting Date:**
04/05/2008, 09:00-11:00
- 4. List of people delivering the session:**
Geza Teleki
Stan Peabody
Aliya Sartbayeva
- 5. Type of Presentation and Information provided, distributed as well as description of what was presented and received from the participants**

The objectives of the meeting were to discuss the feasibility study of project, especially the information and work process of the preliminary environmental impact assessment document.

6. List of attendees using the following Table format:

Agency Name or General Public	Name of Person	Title	Name Hometown or Village
KAZDORPROEKT	Yuriy Komov	Director of Kazdorproekt	Almaty city +7 727 2258205 415A Raimbek St. (former Tashkentskaya St.), , 4 th Floor, Almaty
KAZDORPROEKT	Nelya Ivanovna	Environmental Consultant (Author of Preliminary EIA), Kazdorproekt	Almaty city +7 727 2768856 415A Raimbek St. (former Tashkentskaya St.), , 4 th Floor, Almaty

7. Issues raised by all participants and how they will/are to be addressed:

Issue Raised: including real and perceived environmental issues	Approach to Addressing the Issue as suggested at Session; including <i>how, when and by whom</i>
Preliminary Environmental Impact Assessment has been prepared in 2 months (no field work) with the help of the CREDO simulation model. All data on environmental pollution is simulated for preliminary considerations only.	The detailed EIA is now underway—being prepared by KAZDOPROEKT

8. Conclusion by the group(s) consulted regarding the need, value and environmental problems associated with the work and the upgraded road.

KazDorProekt is currently in progress to prepare a detailed environmental impact assessment

II. RECORD OF ENVIRONMENTAL CONSULTATION AND INFORMATION DISCLOSURE SESSION(S)**1. Projects under consideration including details on design, capacities, sighting etc.**

CAREC Transport Corridor-Terez-Merek and Blagoveschenka-Korday Road Sections, Zhambyl Oblast

2. Meeting Location: *province, city, agency building-*

Zhambyl Oblast, Taraz City, Zhambyl Oblast Territorial Road Department, Committee of Roads, Ministry of Transport and Communication

3. Meeting Date:

5/05/2008, 15:30-17:30

4. List of people delivering the session:

Geza Teleki
Stan Peabody
Aliya Sartbayeva

5. Type of Presentation and Information provided, distributed as well as description of what was presented and received from the participants

The objectives of the meeting were to discuss the environmental impact of this road project, highlight possible concerns and clarify the following issues:

- Institutional structure of Oblast- and Rayon-level road public management institutions and their interconnection and cooperation with other agencies on environmental management and decision-making for large road-construction projects;
- Internal capacities for environmental planning, assessment and management;
- The responsibilities of Oblast and Rayon road and environmental public agencies;
- Contractor's compliance problems, which includes environmental management of work camps, mobile aggregate plants, wastes and emissions, as well as maintenance of equipment and rational use of natural resources.
- Knowledge of possible environmental concerns along the road (erosion, water crossing, surface drainage, potential impact on existing environmental features).

6. List of attendees using the following Table format:

Agency Name or General Public	Name of Person	Title	Name Hometown or Village
Zhambyl Oblast Territorial Road Department, Committee of Roads, Ministry of Transport and Communication	Yerlan Balykbayevich Zhunusov	Head of Zhambyl Oblast Territorial Road Department, Committee of Roads, Ministry of Transport and Communication	Taraz city +7 7262 316006 +7 7262 316004 (Secretary: Rita)
Zhambyl Oblast Territorial Road Department, Committee of Roads, Ministry of Transport and Communication	Toishibay Zhanadilovich Aliakhmetov	Deputy Head of Zhambyl Oblast Territorial Road Department, Committee of Roads, Ministry of Transport and Communication	Taraz city +7 7262 316006 +7 7262 316004 +7 701 524 5341 (Mobile)

7. Issues raised by all participants and how they will/are to be addressed:

Issue Raised: including real and perceived environmental issues	Approach to Addressing the Issue as suggested at Session; including <i>how</i> , <i>when</i> and by <i>whom</i>
Problems with coordinating international organizations, public agencies (national-level and regional-level), and private contractors, involved with the project	Inter-agency Project Coordination Unit and their effective interaction with all related organizations.
International/National level project management and reporting requirements will presuppose the limited environmental institutional capacities of oblast- and rayon-level public organizations.	Clear understanding of requirements and responsibilities for all parties of project management and for all stages of project cycle.

8. Conclusion by the group(s) consulted regarding the need, value and environmental problems associated with the work and the upgraded road.

Oblast territorial road committee department has little experience of managing large international projects and has very limited environmental management capacities.

III. RECORD OF ENVIRONMENTAL CONSULTATION AND INFORMATION DISCLOSURE SESSION(S)

1. Projects under consideration including details on design, capacities, sighting etc.

CAREC Transport Corridor-Terez-Merek and Blagoveschenka-Korday Road Sections, Zhambyl Oblast

2. Meeting Location: *province, city, agency building-*

Zhambyl Oblast, Taraz City, Zhambyl Territorial Department of Environment, Ministry of Environmental Protection

3. Meeting Date:

6/05/2008, 10:00-11:00

4. List of people delivering the session:

Geza Teleki
Stan Peabody
Aliya Sartbayeva

5. Type of Presentation and Information provided, distributed as well as description of what was presented and received from the participants

The objectives of the meeting were to discuss the main responsibilities, functions and environmental management capacities of oblast territorial environmental department, highlight possible concerns and clarify the following issues:

- The process and administration of environmental assessment, expertise, inspection and management capacities of this oblast department;
- The responsibilities of Oblast and Rayon environmental public agencies;
- Contractor's compliance problems, which includes environmental management of work camps, mobile aggregate plants, wastes and emissions, as well as maintenance of equipment and rational use of natural resources.
- Knowledge of possible environmental concerns along the road (erosion, water crossing, surface drainage, potential features).

6. List of attendees using the following Table format:

Agency Name or General Public	Name of Person	Title	Hometown or Village and Tel.
Zhambyl Territorial Department of Environment, Ministry of Environmental Protection	Aldiyarbak Aliasparovich Tusupov	Head Environmental Inspector of Zhambyl Oblast, Zhambyl Territorial Department of Environment, Ministry of Environmental Protection	Taraz city +7 7262 451648
Zhambyl Territorial Department of Environment, Ministry of Environmental Protection	Daniyarbek Ayatolla uly	Senior Environmental Inspection Expert, Zhambyl Territorial Department of Environment, MOEP	Taraz city +7 7262 438225
Zhambyl Oblast Territorial Road Department, Committee of Roads, Ministry of Transport and Communication	Toishibay Zhanadilovich Aliakhmetov	Deputy Head of Zhambyl Oblast Territorial Road Department, Committee of Roads, Ministry of Transport and Communication	Taraz city +7 7262 316006 +7 7262 316004 +7 701 524 5341 (Mobile)

7. Issues raised by all participants and how they will/are to be addressed:

Issue Raised: including real and perceived environmental issues	Approach to Addressing the Issue as suggested at Session; including how, when and by whom
Good quality detailed design documentation should prevent non-compliance issues.	
Contractor's compliance with environmental norms and cooperation with local public agencies.	
The permit for planned environmental inspection requires several months of preparation and approval of oblast prosecutor's office.	
Environmental inspection can be carried out on request in the case of formal application of complaint from the public.	
In case of contractor's non-compliance, punishment with the fine (maximum 2 times); if not improved, then immediate closure of project activities.	

8. Conclusion by the group(s) consulted regarding the need, value and environmental problems associated with the work and the upgraded road.

Oblast territorial environmental expertise department has mainly formal inspection responsibilities. It has little experience of managing large international projects with many dependencies. Furthermore, it could not specify any specific gaps in environmental management capacities, which will probably come out after the clear identification of project management and reporting requirements

IV. RECORD OF ENVIRONMENTAL CONSULTATION AND INFORMATION DISCLOSURE SESSION(S)

1. Projects under consideration including details on design, capacities, sighting etc.

CAREC Transport Corridor-Terez-Merek and Blagoveschenka-Korday Road Sections, Zhambyl Oblast

2. Meeting Location: *province, city, agency building-*

Zhambyl Oblast , Merke Rayon, Merke town Akimat, Office of Deputy Akim

3. Meeting Date:

6/05/2008, 15:00-16:00

4. List of people delivering the session:

Geza Teleki, Consultant

Stan Peabody, Consultant

Aliya Sartbayeva, Consultant

5. Type of Presentation and Information provided, distributed as well as description of what was presented and received from the participants

The objectives of the meeting were to discuss the main responsibilities, functions and capacities of Rayon Akimat and highlight possible concerns about this road project.

6. List of attendees using the following Table format:

Agency Name or General Public	Name of Person	Title	Name Hometown or Village
Rayon Road Maintenance Department, Merke Rayon, Zhambyl Oblast	Bakyt Muratovich Arikbayev	Head Road Engineer, Rayon Road Maintenance Department, Merke Rayon, Zhambyl Oblast	Merke town, Zhambyl Oblast 2-22-51 (Merke)
Merke Rayon Akimat, Zhambyl Oblast	Tolendy Bedembayevich Ryskulbekov	Deputy Akim, Merke Rayon, Zhambyl Oblast	Merke town, Zhambyl Oblast +7 701 2421473 (Mobile)

7. Issues raised by all participants and how they will/are to be addressed:

Issue Raised: including real and perceived environmental issues	Approach to Addressing the Issue as suggested at Session; including <i>how, when and by whom</i>
Contractor's compliance of rules and norms, and cooperation with local people through Rayon Akimat.	
Merke small businesses (cafes and shops) along the existing road through town mostly likely will lose customers. However Deputy Akim does not consider Merke as a high risk area for resettlement or environmental problems during road	

Issue Raised: including real and perceived environmental issues	Approach to Addressing the Issue as suggested at Session; including <i>how, when and by whom</i>
construction.	
Deputy Akim raised a risk of construction and resettlement of highly populated area of mountain range between Zhambyl and Chimkent, and the importance of the local people participation.	

8. Conclusion by the group(s) consulted regarding the need, value and environmental problems associated with the work and the upgraded road.

Rayon Akimat has very little or no involvement in the feasibility stage of project. The execution stage will most likely require Contractor's closer cooperation and joint work with the Rayon level various departments.

V. RECORD OF ENVIRONMENTAL CONSULTATION AND INFORMATION DISCLOSURE SESSION(S)

1. Projects under consideration including details on design, capacities, sighting etc.

CAREC Transport Corridor-Terez-Merek and Blagoveschenka-Korday Road Sections, Zambyl Oblast

2. Meeting Location: *province, city, agency building-*

Almaty city, Kazhydromet (Hydrological and Meteorological Service), Ministry of Environmental Protection

3. Meeting Date:

8/05/2008, 16:00-17:00

4. List of people delivering the session:

Geza Teleki
Aliya Sartbayeva

5. Type of Presentation and Information provided, distributed as well as description of what was presented and received from the participants

The objectives of the meeting were to discuss the main responsibilities, functions and capacities of Kazhydromet (Hydrological and Meteorological Service) and highlight possible concerns about this road project.

6. List of attendees using the following Table format:

Agency Name or General Public	Name of Person	Title	Name Hometown or Village
Kazhydromet (Hydrological	Paiyzkhan	Deputy General	Almaty city

and Meteorological Service), Ministry of Environmental Protection	Zholmendievich Kozhakhmetov	Director, Kazhydromet	+7 727 2675218 +7 701 2126344 (Mobile) 32 Abai St., Almaty
Kazhydromet (Hydrological and Meteorological Service), Ministry of Environmental Protection	Panarkhan Kurabayevna Shingisova	Head of Environmental Monitoring, Kazhydromet	Almaty city +7 727 2542549 +7 727 2675174 32 Abai St., Almaty

7. Issues raised by all participants and how they will/are to be addressed:

Issue Raised: including real and perceived environmental issues	Approach to Addressing the Issue as suggested at Session; including <i>how, when and by whom</i>
Mudslides and flooding of season rivers	Project design and scoping to include KAZHYDROMET advice re locations of mudslides and spring freshets.
Erosion of in mountain areas	Same as Above
The project required cooperation of Oblast Meteorological stations and Environmental Inspection agencies in the region.	Detailed design team to collaborate with Oblast Met. Station to obtain relevant data to properly size surface water conveyance structures, etc.

8. Conclusion by the group(s) consulted regarding the need, value and environmental problems associated with the work and the upgraded road.

Kazhydromet and its oblast stations have not been involved or formally requested for any information or activities on this project. There is no clear official linkage between this agency and the other line agencies like MOTC and MOEP.

Annex Table 2B: Second Consultation Session

1. Meeting Location:

Zhambyl oblast, village Korday, akimat of Korday district

2. Meeting Date:

14/07/2008, 11.30 - 12.30

3. Name of projects under consideration including details on design capacities, sighting etc.

Consultation Survey Concerning Section 6 of Project 1 of the ADB MFF Road Development Loan

4. Person delivering the session:

Svetlana Shakirova

5. Type of Presentation and Information provided, distributed as well as discussion of what was presented and received from the participants

The objective of the meeting was to inform local authorities, heads of villages of Korday district and especially of the villages close to section 6 on the following issues:

- general purpose of the project, the location of Section 6;
- Initial Environmental Assessment, based on the GoK and ADB requirements;
- extent of work to be completed: underscoring that all work would be within the existing RoW ,

- summary of the overall schedule for the EIA and the implementation of the mitigation and monitoring plans and the contractors responsibility.

All participants filled up a survey form and were asked for comments regarding the project.

6. List of attendees:

	Agency Name or General Public	Name of Person	Title	Name Hometown or Village	Telephone
1	Akimat of Korday district	Bakhantsov I.P.	Chief specialist	Korday	2-69-16
2	Kemen village	Ospan M.E.	Akim	Kemen	7-83-98
3	Korysay village	Surlubaev M.M.	Akim	Korysay	3-44-21
4	Aukhatty village	Anarbekov	Akim	Aukhatty	3-83-89
5	Stepnoe village	Ryssymbekov A.	Akim	Stepnoe	2-83-67
6	Sulutor vilage	Mussaev K.	Akim	Sulutor	3-33-18
7	Masanchi village	Umar B.M.	Deputy akim	Masanchi	3-10-41
8	Otar village	Baimukhametov	Akim	Otar	7-13-30
9	Kannatas village	Omarov A.	Akim	Kannatas	2-31-98
10	Ulken Sulutor village	Sultanalieva Zh.	Chief specialist of rural district	Ulken Sulutor	3-55-19
11	Zhambyl village	Adilkhanova K.S.	Chief specialist of rural district	Zhambyl	2-83-39
12	Kassyk village	Nursadykova A.	Chief specialist of rural district	Kassyk	2-40-47
13	Nogaibay village	Tatepbaeva S.M.	Akim	Nogaibay	2-72-19
14	Sortobe village	Abdyldaev T.Yu.	Akim	Sortobe	3-10-24
15	Betkainar village	Omarbaev E.K.	Deputy akim	Betkainar	2-57-23
16	Maslikhat of Korday district	Makulbaev	secretary	Korday	
17	District hospital of Korday	Zamanov E.	Chief doctor	Korday	
18	Department of irrigation systems	Sergeev	director	Korday	
19	Financial unit	Abduzhalieva S.	Deputy director	Korday	
20	District road maintenance unit No. 34	Beisembaev M.	Chief engineer	Korday	
21	Economic unit	Salieva N.	Deputy	Korday	

			director		
22	Agricultural unit	Moldabekov N.	Head of unit	Korday	
23	Apparatus of akim	Ibraimov M.	Chief inspector	Korday	2-69-16
24	Unit of housing, communal service, passenger traffic and roads	Alibekov S.	Chief specialist	Korday	2-14-48
24	Akimat of Korday district	Afanassiev A.N.	Deputy akim	Korday	
25	Environmental unit	Balpugov M.	director	Korday	2-69-16
27	Apparatus of akim	Sarmanov B.	Chief inspector	Korday	2-69-16
28	Apparatus of akim	Tungatarova M.	head	Korday	
29	Unit of housing, communal service, passenger traffic and roads	Imarov A. S.	Head of unit	Korday	2-14-48
30	Unit of housing, communal service, passenger traffic and roads	NN	specialist	Korday	2-14-48

7. Issues raised by all participants and how they will/are to be addressed:

Issue Raised: including real and perceived environmental issues	Approach to Addressing the Issue as suggested at Session; including <i>how, when</i> and by <i>whom</i>
Tree removal program: whether old trees and shelter belt plantings along roadsides will be liquidated?	According to the technical description of road reconstruction on unit 6, provided by Zhambyl Oblast Territorial Road Department, trees located very closely to the road will be removed and replaced by replanting young trees of the same species.
How much will be widened the existing road? Will the existing carriageway be wider, on how many meters exactly?	New road will have 15 m width, carriage way- 7,5 m, shoulders- 3.7m each, RoW- 40 m, etc.
Road reconstruction inside Korday village: where and what exactly will be done?	Roads inside Korday village, as well as pavements, pedestrian zones and traffic lights create big concern of local people. Improvement of pavements and establishing new traffic lights are very much needed currently. If unit 6 connects Korday with Blagoveschenka, people do hope, that roads inside Korday village will be repaired, too.

8. Conclusion by the group(s) consulted regarding the need, value and environmental problems associated with the work and the upgraded road.

From 30 participants of the meeting about a half were aware about the project 'Transport corridor "Western China - Western Europe"'. Their interest to this project is connected mainly with expected improvement of local roads. Environmental concerns are focused mainly on the tree removal program.

As the deputy akim of Korday district Mr. Afanassiev stressed in the conclusion of event, this is THE FIRST TIME WHEN GOVERNMENT AND INTERNATIONAL AGENCIES ASK LOCAL POPULATION OPINION **BEFORE** THE PROJECT REALIZATION PERIOD. Unfortunately, influence of public opinion and decision-making abilities of the district authorities have no big significance in this road project. Anyway all attendees, in spite of the lack of time in the period of harvest collecting, were interested to know more about this important investment project and they do hope that the road will be repaired in short time and with high quality.

Results of the Survey Administered during the Second Survey

Number of survey forms distributed – 30

Number of survey forms returned – 30

Total No Surveys Used: 27		No. Surveys with Score			
1) When did you first know about this project?	1	2	3		
1.1 just now	13				
1.2 several months ago		8			
1.3 More than 6 months ago			6		
Total No Surveys Used: 27		No. Surveys with Score			
2) How were you made aware of this project?	1	2	3	4	
2.1 This consultation	13				
2.2 In the newspaper		2			
2.3 word of mouth			1		
2.4 municipal notice				11	

Total No Surveys Used: 29	No. Surveys with Score					
3) Having heard the information presented at the consultation meeting, to what extent do you think the proposed project will affect the following components of the environment during a 3-year construction period in your area: [Circle one number 1 2 3 4 5 or P: 1=least concern, 5= greatest concern, P-WILL HAVE A POSITIVE EFFECT]	1	2	3	4	5	P
3.1 Noise:	4	3	9	11	3	0
3.2 air pollution and dust:	3	1	4	11	10	0
3.3 blockage of water courses:	3	1	9	8	8	0
3.4 loss of trees and ground cover:	1	3	5	13	8	0
3.5 water and waste pollution from contractor work camps:	2	3	8	9	7	0
3.6 soil erosion	5	6	10	6	2	0
3.7 traffic congestion	2	6	10	6	2	0
3.8 loss of access to property	8	3	8	8	0	1
3.9 Failure to replant and rehabilitate areas disturbed by construction activities	6	2	7	9	5	1
3.10 Other: Please state and evaluate	0	0	0	1	0	3
Comments						

Total No Surveys Used: 29	No. Surveys with Score				
4) Do you think that the mitigative measures proposed for the following issues, as part of mitigation plan are adequate? 1=least, 5=most	1	2	3	4	5
4.1 Noise	2	9	13	4	2
4.2 air pollution and dust	0	13	10	5	1
4.3 blockage of water courses	1	9	12	3	1
4.4 loss of trees and ground cover	3	8	13	4	1
4.5 water and waste pollution from contractor work camps	2	11	13	2	0
4.6 soil erosion	1	12	10	5	0
4.7 traffic congestion	2	6	10	10	0
4.8 loss of access to property	2	7	9	8	1
4.9 Failure to replant and rehabilitate areas disturbed by construction activities	2	8	13	5	0

Total No Surveys Used: 30		No. Surveys with Score	
5) For any of the issues in No. 4 where you felt that the measures proposed were not adequate, please provide your suggestions: Please list the item number , followed by your suggestion:			
#	Issue	No. Surveys	Measures proposed
5.1	Noise	6	Proper management of traffic related noise in villages
5.2	air pollution and dust	12	Watering of roads used for earthworks and construction materials transportation
5.3	blockage of water courses	9	Construction of new bridges and culverts
5.4	loss of trees and ground cover	15	Replanting trees
5.5	water and waste pollution from contractor work camps	7	Solid and sanitary waste self-management by contractors
5.6	soil erosion	4	Erosion Protection measures to be applied as in EMP
5.7	traffic congestion	10	Especially in Korday village. To construct a bypass road. To regulate traffic during construction period.
5.8	loss of access to property	5	

5.9	Failure to replant and rehabilitate areas disturbed by construction activities	10	Full rehabilitation program.
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Total No Surveys Used: 35	No. Surveys with Score					
6) Please evaluate each if the following issues according to the importance you think they could have for your local environment and community: 1=least, 5=most P=positive impact	1	2	3	4	5	P
6.1 Contractors not working within the boundaries of their worksite and unnecessarily damaging the local natural environment?	7	8	4	2	3	0
6.2 Construction noise and dust affecting your health and living condition?	3	1	4	10	8	0
6.3 Inadequate enforcement of control measures by the authorities during construction period as specified in the EIA, leading to significant negative impacts?	4	3	3	5	11	0
6.4 Contractor failing to consult local landowners before work begins, leading to damage to property or other assets	5	3	4	2	10	0

Total No Surveys used: 21	No. Surveys with Score					
7) Having heard the information presented at the consultation meeting, to what extent do you think the proposed project will affect the following components of the environment once the new/upgraded road is operational:	1	2	3	3	5	P
3.1 Noise:	6	4	1	6	6	1
3.2 Dust:	7	5	4	3	4	1
3.3: Air pollution	7	4	3	5	4	1
3.4 Traffic safety risks	6	2	4	6	6	1
3.5 Traffic congestion	10	3	3	3	1	1
3.6 Danger to your health	10	3	3	3	5	1
3.7 Visual Intrusion (blockage of you view):	8	2	4	4	3	1

[Circle one number 1 2 3 4 5 or P: 1=least concern, 5= greatest concern, P-WILL HAVE A POSITIVE EFFECT]

8) For any of the issues in No. 7 where you felt that the measures proposed were not adequate, please provide your suggestions.

Total No Surveys Used : 5

Please list the item number , followed by your suggestion:

1. Tree replanting program.
2. Proper expenditure of financial resources allocated for road reconstruction.
3. Improvement pavements and local roads inside villages is very needed.
4. Noise, dust, air pollution, road safety.
5. Noise, road safety.

9) Please identify any cultural or historical sites in this area that you think might be negatively affected by the project/

Total No Surveys Used :3

- i. Name of site: Cemeteries along the road
- ii. Location Of Site: Kassyk village, Betkainar village
- iii. Why is it important: Graves of relatives and ancestors.

10) Please describe any other concerns that you have that have not been covered in the presentation today:

None.

ANNEX 3 CULVERTS AND BRIDGES: ENVIRONMENTAL CONSIDERATIONS DURING DESIGN AND CONSTRUCTION

I. Drainage, Culvert and Bridge Placement and Design

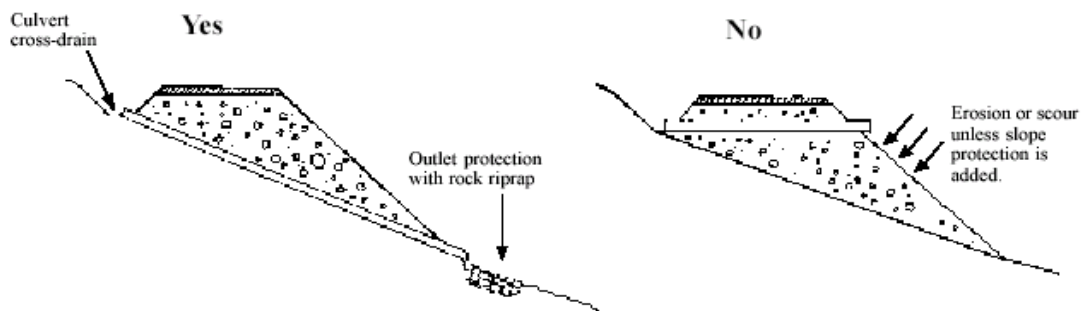
The road, particularly in Section 3 passes across complex surface drainage systems with many intermittent streams and drainages from the mountains to the south. The existing structures are old and in some cases have either acted as dams for surface drainage or prevented adequate water from reaching lands downstream of the road. All the culverts on Project 1 roads will need to be replaced and designers should take advantage of this to make sure that the sizing and placement of culverts have no impact and in fact improve any past drainage problems. As part of the design exercise cross-drainage features will need to be designed to match the volume of waters during the spring runoff season and the brief rainy period, in order to avoid unwanted ponding and possible flood damage (Figure 1) later.

A simple reconnaissance of the surface water drainage features in relation to the new alignment and profile of the upgraded road should be completed to ensure an adequate design. Decisions on the type, size, location and frequency of culverts, are all part of project design and should be based on the knowledge of maximum flows and overall surface drainage characteristics. Generally, these data are derived from surface hydrology models which, once provided with reconnaissance data, provide specific design parameters such as type, dimensions and preferred locations of structures. The problems arise with their physical placement since these design considerations are left to the contractor. Culverts often become chronic erosion points and weak links in road design and operation.

Therefore, four design elements relating to future environmental impacts will need to be carefully identified for each culvert. These are a) culvert placement, b) culvert diameter, b) slope of the structure from upstream to downstream and c) design of erosion protection measures at the inflow and outflow of each culvert. The steeper the angle of the culvert, as it is placed into the ground, the greater the need for rock gabion protection at structure's inflow and outflow portal. The sketches attached define culvert- erosion protection options on rural roads, but can adapted to provincial roads, since basic design considerations are the same.

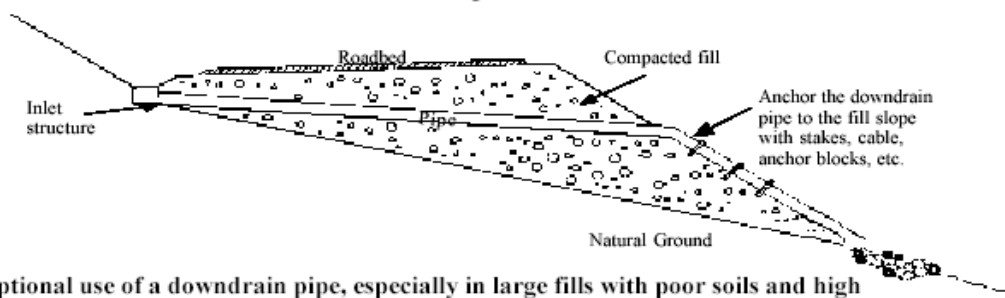
Finally, all now culverts should be photographed and a culvert inventory created. All engineering specifications and digital photos of the culvert's inlet and outlet should be place in a record sheet and used by the Oblast Transport Inspection Unit to maintain these assets. These sheets should be provided by the contractor as the culverts are installed.

Figure 1. Environmentally acceptable culvert design details

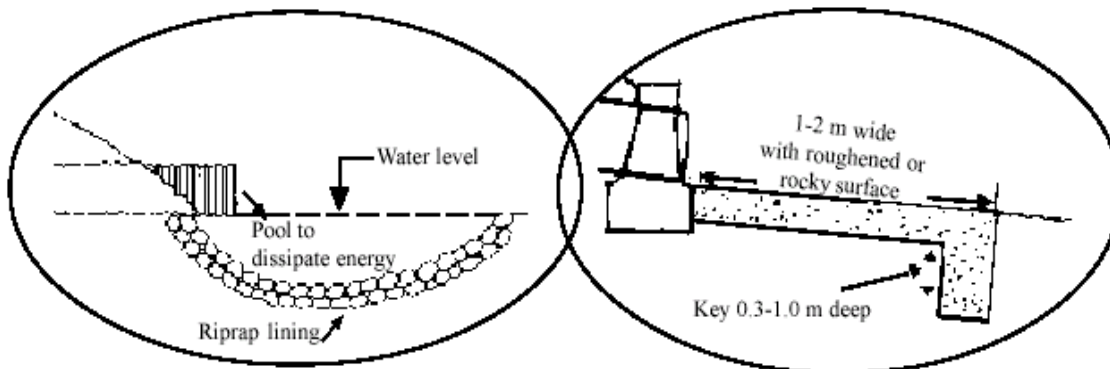


The outlet of the pipe should extend beyond the toe of the fill and should never be discharged on the fill slope without erosion protection.

Optional



Optional use of a down-drain pipe, especially in large fills with poor soils and high rainfall areas, where fill settlement may require culvert repairs.



Detail of outlet with riprap and plunge pool.

Detail of splash apron with scour cutoff key.

II. Environmentally compatible bridge design/rehabilitation actions

For this project, environmental considerations when demolishing and reconstructing the 13 bridges involve assuring that waterway channels are not restricted, old bridge debris is properly disposed of or reused in some way, banks and shorelines are not disturbed leading to erosion, that visually the structure fits the surrounding natural and built environment and that the timing of work does not interfere with drainage. Environmentally responsible design and construction methods are easily achievable so long as the designers and builders follow the following fourteen guiding principles:

Design options to consider and implement

- Prevent debris from structures to be demolished from obstructing the waterway or being disposed of without environmental considerations, including visual intrusion;
- Use an adequately long bridge span to avoid constricting the natural active (bank-full) flow channel. Minimize constriction of any overflow channel;
- Protect the upstream and downstream approaches to structures with wing walls, riprap, gabions, vegetation, or other slope protection where necessary;
- Place foundations onto non-scour susceptible material (ideally bedrock, concrete or coarse rock) or below the expected maximum depth of scour.
- Prevent foundation or channel scour with the use of locally placed heavy riprap, gabion baskets, or concrete reinforcement. Use scour protection as needed;
- Locate bridges where the water channel is narrow, straight, and uniform. Avoid placing abutments in the active water channel;
- Where necessary, place in-channel abutments in a direction parallel to the water flow;
- Consider natural channel adjustments and possible channel location changes over the design life of the structure;
- Use retaining structures as needed in steep, deep drainages to retain the approach fills, or use a relatively long bridge span;
- Allow for enough freeboard between the bottom of bridge girders and expected high water level and floating debris, plus any other passage expected, etc.

Design options to avoid

- Placing piers or footing in the active water channel or mid channel;
- Placing approach fill material in the drainage channel;
- Placing structural foundations on soil deposits such as silts and fine sands;
- Constricting or narrowing the width of the natural water channel.”

Source: The IEE consultants and in part Keller and Sherar, 2003 (Chpt. 6 & 10)