

Initial Environmental Examination

April 2011

UZB: Second Central Asia Regional Economic Cooperation Corridor 2 Road Investment Program

Prepared by the Road Fund under the Ministry of Finance of the Republic of Uzbekistan for the Asian Development Bank.

The Initial Environmental Examination is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature.

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Acknowledgement

The initial environmental examination (IEE) team comprised international and national environmental specialists, a national noise and air quality modeling specialist, and a technical translator. District staff from both Tashkent and Namangan regions participated in the consultation meeting and provided the minutes attached to this IEE. The Road Fund (executing agency of the investment program) and Uzavtoyul staff from Tashkent and Namangan regions also provided input as required. National experts in soil erosion, slope stabilization and revegetation were also consulted. All Inputs are gratefully acknowledged.

LIST OF ACRONYMS AND DEFINITIONS

Item	Units	Definition
AADT	No veh/day	Average Annual Daily Traffic
amsl	na	Above mean sea level (usually refers to altitude)
AP	No.	Affected Person (as in land or assets losses)
CAREC		Central Asia Regional Economic Cooperation
C/L		Center line of roadway; abbreviation
CO ₂	mg/cm ³	Carbon dioxide
COI	m	Corridor of Impact (a width over the road centerline considered the direct impact width)
CSC		Construction Supervision Consultant
dBA	dBA unit	A measure of audible (the ear) sound
District		District Administrative Region (in Russian-rayon)
EMiP		EMP: Mitigation Measures Table
EMoP		EMP: Monitoring Measures Table
EMP		Environmental Management Plan
FIDIC		<i>Fédération Internationale Des Ingénieurs-Conseils</i> (Int'l Federation of Consulting Engineers)-Provide standard construction contract templates used around the world for international competitive bidding.
Fly-over		A road or bridge constructed to pass over an existing road permitting traffic to pass over the existing road
Glavgosekoexpertiza		The Environmental Assessment Department within Goskompriroda
Goskompriroda		Uzbek National Environmental Management Agency
GRC		Grievance Redress Committee
KMK		Abbrev. for any one of hundreds of Uzbekistan's legal standards and rule (In Russian SNIP)
L _{eq}	dBA	General sound level occurring over a 24 hour period
L _{night}	dBA	Sound levels measured during the hours of darkness
L ₁₀	dBA	Sound level exceeded 10% of the time.
LARAP		Land Acquisition and Resettlement Action Plan, also RAP or LAR
MFF		Multi-tranche Financing Facility-a type of ADB loan
NO ₂	mg/m ³	Nitrate or Nitrogen Dioxide
PCU		Passenger Car Unit (a coefficient used to bring all vehicle types to the equivalent of passenger car counts, e.g. 1 articulated truck equals 3 PCUs
PEIA		Preliminary Environmental Assessment, Screening or Terms of Reference Document prepared as a 1 st step of the Uzbek environmental assessment process
PMU		Program Management Unit, established to manage a single large project, such as this MFF
PSIA		Poverty and Social Impact Analysis
Region		Regional Administrative Region (in Russian Oblast)
RRF		Uzbekistan Republic Road Fund
SP		Subproject or section package (road sections as packaged for the MFF)
SPS		ADB's 2009 Safeguard Policy Statement; or new environmental and social safeguard standards
ST		Safeguards Team under the PMU
CH	mg/m ³	Concentration of hydrocarbons in the air
TSP ₁₀	micrograms/m ³	Suspended particulate matter , with particles ≥ 10 microns in size, and a danger to lungs
Uzavtoyul		Uzbekistan's Road Maintenance & Operation Agency
UZB		Republic of Uzbekistan

1 Introduction

1.1 The Project

1. The proposed Multitranchise Financing Facility (MFF) for the second CAREC Corridor 2 Road Improvement Program comprises 3 tranche projects. Tranche I project (the project) includes reconstruction of an approximately 74 km section of the A373 highway (between Km116 and Km190). Other sections of this highway between Km108 and km116 and between km190 and km208 are also to be reconstructed at both ends of the A373 highway but they are being funded by the Road Fund. This IEE report covers the whole section of the highway A373,

2. The ADB funded portion will involve the replacement of old asphalt pavement with concrete, and the paving of all shoulders. In addition, 219 culverts (of which 195 will be ≤ 1.5 m diameter standard circular metal culverts) will be replaced. No new culvert locations are anticipated. Finally four bridges will have their decks resurfaced with asphalt.

3. This project is maximizing materials reuse by reprocessing the old asphalt (removed from the road via large grinding equipment) and using it, in a mixture with aggregate, as the sub-base for the new surface.

4. Finally, the project also involves a considerable amount of erosion control work to mitigate the serious damage done within the project corridor during the GoU construction activities between 1996 and 2002. This work will be fully funded by UZB but is summarized in the IEE, since its completion relates closely to the safe operation of the project road.

1.2 The Proponent and Purpose of the IEE

5. The Republic Road Fund (RRF) is the executing agency. It has established a project management unit (PMU) and appointed a director and a team of nine professional and support staff to implement the first investment program and to undertake advance contracting for tranche 1 of the second investment program. The PMU is structured with a specific mandate: technical; legal; procurement; monitoring, reporting, and evaluation; safeguards; and gender development. For the second investment program, RRF will add seven more professionals (deputy project director, two road engineers, financial management specialist, results monitoring specialist, procurement specialist, and accountant) to the PMU. The PMU will also incorporate all consulting services (construction supervision consultant or CSC) under the project, including assistance to the provinces and will oversee the conduct of feasibility studies by project consultants.

6. Responsibilities of the RRF include: overseeing the submission of the IEE to Glavgoosekoexpertiza for government review, ensuring that all documentation is compliant with UZB and ADB requirements; obtaining necessary permits and/or clearance, as required, from Goskompriroda and other relevant government agencies, before commencing any civil work; and, submitting the final approved IEE, to ADB implementing overall environmental management plan submitting the environmental monitoring report.

7. The PMU will hire a CSC and also establish a Safeguards Team¹ to oversee the planning and implementing of mitigation and monitoring measures during detailed design,

construction (resurfacing)¹ and operation of the road. The Safeguard Team will also responsible to prepare and submit environmental monitoring report. The mitigation measures related with environmental impacts associated with the construction works will be implemented by the contractors with guidance from the CSC. For the operating period the responsibility will be handed over to the region-level Uzavtoyul.

8. ADB classified this project as a B project requiring an IEE since this is a simple road and bridge resurfacing activity, restricted to within the road RoW, involving the width of the carriageway and shoulders. In other words it will involve simple upgrading. The IEE will nevertheless identify the likely impacts during the planning, construction and to a much lesser extent operations of the resurfaced road, propose mitigative measures and suggest appropriate monitoring actions to ensure compliance. The main output from the IEE will be a plan specifying ways to either eliminate any significant impacts or reduce them to acceptable levels, i.e., reducing them to within Uzbekistan standards and norms, and ADB's requirements.² The IEE will also identify the reporting and monitoring responsibilities such that for each mitigative action a person responsible is identified, and adequate reporting takes place.

1.3 Project Status and Documentation (Feasibility Study)

9. The second CAREC Corridor II Road Improvement Program with the planned three projects will upgrade Highways A373, A380 and A373/4R112 respectively. The IEE is being prepared for the resurfacing work on A-373 (between Km116 and km) 190, located in Tashkent and Namangan Regions. The overall packages are defined in Table 1 and in map.

Table 1: Description of CAREC COR. 2, Investment Propgram II

Project I: A373 :	Km 116 to Km190	74 Km
Project 2: A380 :	Km 228 to Km315	87 km
Project 3: A373/4R112:	Km 0 to Km 75	75km

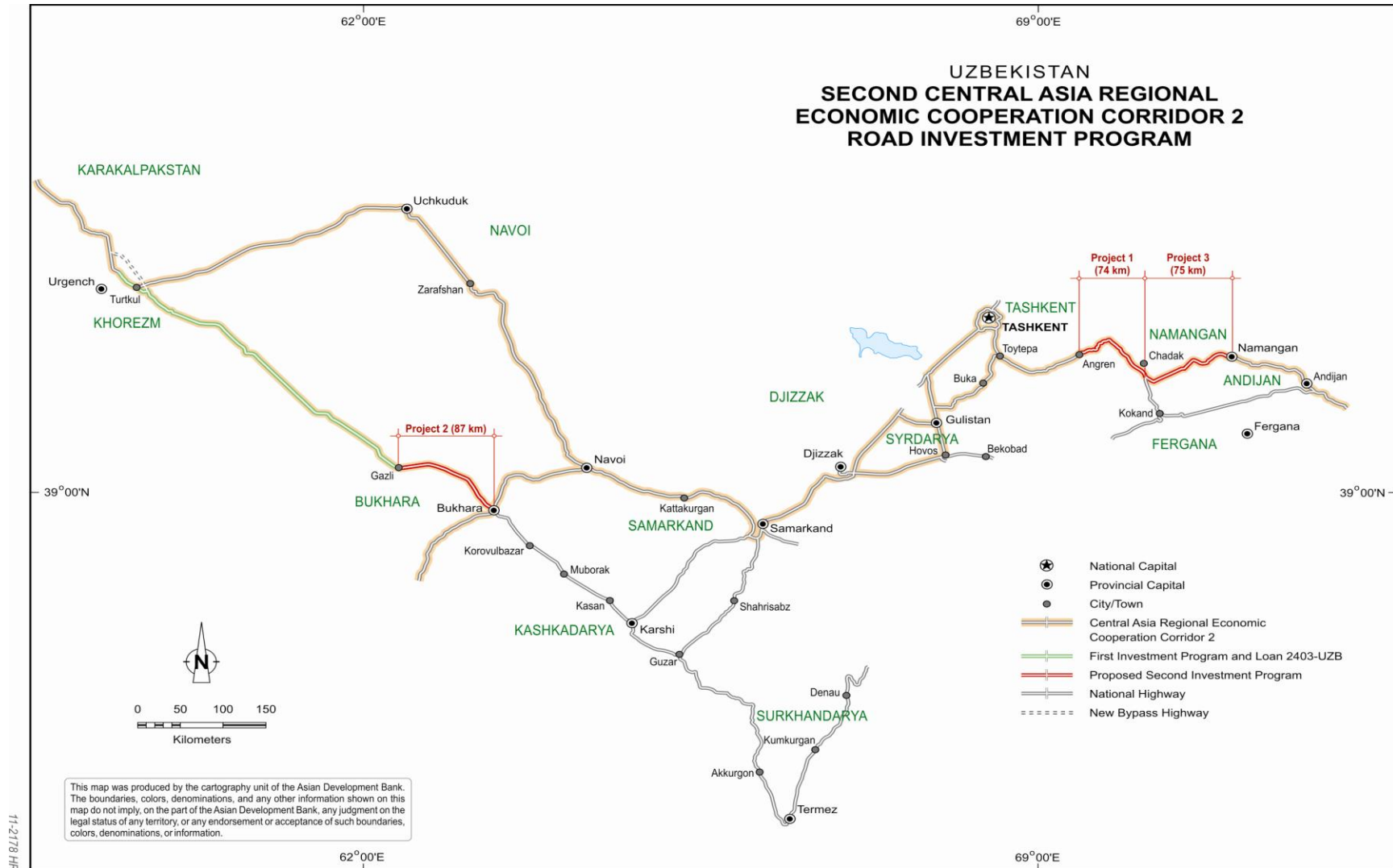
See Map 2 for details on location.

10. In addition to the UZB Feasibility study a new complete Feasibility Study is nearing completion by the consultant and it is being used as a reference and baseline document for this IEE.

¹ RRF has recently retained an environmental specialist who will be responsible for compliance monitoring and ensuring that mitigation and monitoring is properly implemented

² Every effort will be made to prevent impacts from occurring through better road planning and design

Map 1: Project Road (Phase II, Tranche I) 2011





Map 2: Project corridor Km. 108–208, plus locations of construction material sites

1.4 Extent and Boundaries of the IEE Study

11. The IEE work was initiated in December 2010 and a draft document was submitted to the ADB in 7 April, 2011. The project road section begins at about 100 km from Tashkent at 990m above mean sea level, outside Angren Town and climbs through the Chatkal mountains and passes through the shoulders of upper low mountains and middle mountains, through mountain steppe, marginally forested areas and mountain meadow landscapes, paralleling the Rezaksai and Angrensai (Akhangaran) River valleys. The Kamchiksai and Ertoshsai rivers, tributaries to the Akhangrangsai are also crossed by the existing road.

12. The removed and crushed asphalt will be temporarily stored at one of 7–8 storage sites along the project road, where it will be reprocessed and reused as sub-base material for this project. This may require some minor preparatory work to control runoff. As well four bridge decks will be resurfaced with new asphalt, and two small tunnels will also receive new asphalt surfaces.

This IEE boundary will therefore extend to the edge of the road right-of-way; or 25 m from either side of the pavement edge. At the 4 river crossings the corridor of impact will be 50m upstream and 100 m downstream where A373 crosses these waters.

1.5 Content of the IEE and Methodology Applied

13. In addition to introductory and linking text, the IEE contains six key sections:

1. description of existing conditions with a focus on sensitive components of the environment;
2. identification of Impacts during design, construction and operating periods
3. specification of mitigative actions and monitoring follow-up for all significant effects likely to occur.
4. a record of consultation and information disclosure as well the follow up actions taken;
5. the Environmental Management Plan (EMP) specifying all mitigative and monitoring actions, applying relevant public input as well specifying reporting requirements and an implementation schedule; and,
6. the cost of completing these mitigative and monitoring actions over the design, construction and operating periods of the project.

This IEE required three field reconnaissance surveys, involving some primary field data collection, using maps provided by the RRF's Design Institute. As the road passes through a national high security zone, no other maps were available or permitted for reproduction in this IEE.

14. Most predictions of construction period impacts were based on the consultant's experience, secondary data, consultation with RRF and Uzavtoyul, as well as consultation with people in the affected districts. Future noise levels were estimated through the application of nomograms, accounting for traffic volume, traffic composition, average speed and the ground cover within 50 -100 m of the roadside (Chap. 4 Mulholland, 1981, Noise Assessment and Control and UZB- KMK 2.01.08-96). Air quality changes were estimated by inserting traffic volume, composition, topography, vehicle speed, and pavement conditions data into the PVD Ekolog Model V. 3.3 (operated by Uzavtoyul) which then generated the air quality conditions for

2011 and 2021 as plots with concentrations at varying distance from the carriageway at km 116, representing the entire 78 km project alignment.³

1.6 Policy, Legal and Administrative Framework

15. The State Committee for Nature Protection (Goskompriroda) is the primary environmental regulatory agency, and reports directly to the Parliament, and is responsible for the implementation of The Law on Environmental Protection⁴ (1992). Specifically, it is responsible for supervising, coordinating and implementing environmental protection and controlling the usage and renewal of natural resources at the central, region and district levels. The mandate of Goskompriroda is based on the Regulation on the State Environmental Committee of the Republic of Uzbekistan (1996).

16. The organizational of Goskompriroda consists of a central body in Tashkent, and regional and district branches and agencies for scientific and technical support. Goskompriroda, through its State Ecological Expertise Department (SEE) (Glavgosekoexpertiza) reviews, inter alia; environmental impact reports, prepares and implements ecological regulations and standards, coordinates environmental programs and elaborates the structure for environmental monitoring and governance of nature reserves. It approves regulations and issues permits for pollutant emissions and may prohibit projects and construction works that do not comply with environmental legislation. Any IEEs or IEEs prepared as part of this project would need review and clearance by the SEE at the national level as well as Region-level officials (Figure 1: Uzbek. IEE document submission and approval process

17. In addition to the 1992 Law in Environmental Protection, Goskompriroda uses the following additional legal instruments to manage environmental issue related to road development:

- Law on Protection and Management of Flora Approved in 26.12.07, No. 543-1
- Law on Wildlife Protection and Management. Approved in December 26 1997
- Law on Protection and Management of Flora. Approved in December 26 1997// New Laws of the Republic of Uzbekistan. 18th Edition, p.207.
- Law on Forest No. 770-1. Approved in 15.04.1999
- Law on Introduction of Amendments into the Law on Nature Protection and On Specially Protected Environmental Areas. Approved in May 5–6 1994// New Laws of the Republic of Uzbekistan. 10th Edition, p.242. (*Biodiversity*)
- Law on Atmospheric Air Pollution. 1999. Including ambient air quality standards, emission standards and Guidelines for Application (#469-1999).
- Law on Water Pollution. 1999
- Law on Mineral Resources, October 23, 1994 (borrow areas and quarries)
- Law on Ecology Security (Safety), 2005
- Law on Health Safety and Environment, May 6, 1993 (Occupational Health and Safety).

³ 78 km since there is an existing concrete section between km 116 and 198. Also no other locations were considered necessary since the traffic along this section remains uniform, since there no new vehicles entering the road along this 100km stretch. At km 116 NH A373 is already at 1,100 m amsl.

⁴ At present Uzbekistan uses a more reactive, as opposed to preventative, approach to management of environmental impacts of development projects.

- KMK (Standard) 301012-2000, “Health Safety in construction ”
- Rules and Norms developed by Road Research Institute in December 2008 on health protection while working in asphalt making plant and other quarries used in road construction
- Law on Protection Archaeological Monuments, October 13, 2009

18. Uzbekistan has a large set of specific standards or ‘KMKs’ that refer to the handling and disposal of specific wastes ranging from sewage to hazardous wastes, fuel as well as to air and noise quality. The national Law on Ecological Expertise (Assessment) dated from May 25, 2002, No. 73-11 addresses Environmental Assessment and defines for which types of projects an IEE must be undertaken. Preparation of the review reports and approval of projects on environmental grounds is regulated by the Resolution of the Cabinet of Ministers No. 491 of 31 December 2001. Annex 1 of Resolution 491 defines four categories of projects and the associated environmental assessment requirements (Figure 1: Uzbek. IEE document submission and approval process

19.). Category I Projects require a preliminary IEE (PIEE) defining how and to what extent the required IEE will be conducted, followed by a complete IEE. Category I and II are undertaken and evaluated at the central level only.

20. Category III projects are completed in two stages by the State level agency, with the Region level agency actively involved. As with Category III projects, these IEE involves:

- Step 1. Preparation of a completed Preliminary Environmental Impact Statement (same as IEE);
- Step 2. Review and Approval of IEE by National and Regional entities;
- Step 3. Implementation of mitigation and monitoring measures by proponent with regional Goskompriroda oversight.

21. At Stage 3 Goskompriroda, working at both the state and region levels, defines the pollution limits the project is permitted to reach.

22. The assessment of Category I is under central jurisdiction with Glavgosekoexpertiza involvement. The Category III is most similar to ADB's IEE and Category IV projects are exempted from any IEE requirements, other than the submission of a project description and proof of Category IV status. Uzbekistan allows Goskompriroda a maximum of 30 days to review Category I and II projects and 20 days for category III and 10 days for Category IV projects.

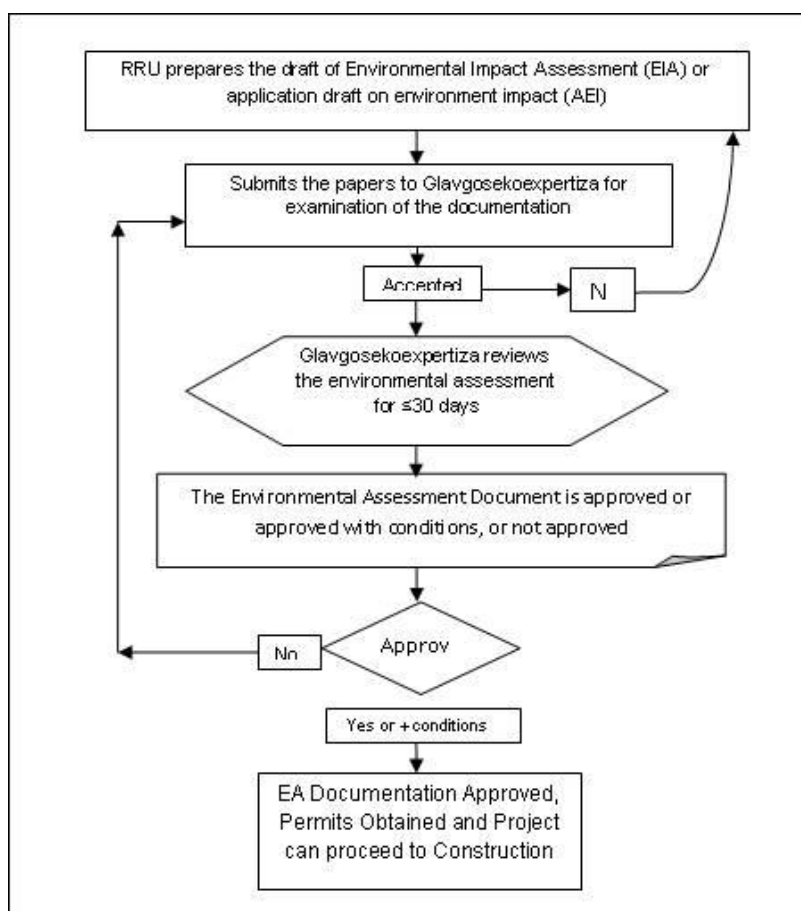


Figure 1: Uzbek. IEE document submission and approval process

23. The EA process in Uzbekistan needs further strengthening to achieve sustainable development. Some of these gaps were to be filled via training workshops and in particular a World Bank project completed in 2005. Since then little has taken place, other than the marginal on- the-job training on project like this one. However, the 2005 training was not given to the Uzbekistan Road Operation and Management Agency (UZAVTOYUL) or RRF staff; therefore a large gap remains. RRF has initiated the process of filling that gap by retaining a safeguard specialist on its staff

24. For this MFF-II, Tranche I project is categorized as class III in accordance to the UZB Environmental impact assessment regulation. The consultant prepared the IEE by following the ADB's Environmental Requirement as define in SPS, 2009 on behalf of the project proponent, the RRF.

25. Once the IEE has been approved the proponent will comply with all required procedure for obtaining various permit, followed by the mobilization of the contractor(s), and the implementation of mitigative and monitoring issues agreed to in the IEE.

1.7 Schedule for IEE Approval, EMP Implementation in Context of Project

26. Given that this is an IEE with no permanent negative effects (assuming mitigative measures are implemented), and the IEE project approval will be completed within 60–90 days of the submission of the draft IEE, which scheduled for May 2011.

2 Description of the Project

2.1 Type of Project and Category

27. This project is an ADB Category B project and requires the completion of an IEE, which is more or less the same as UZB's Category III environmental assessment. The category assumes that all impacts are well understood and mitigative and monitoring actions are standard and can be implemented without delay or conflict.

2.2 Need for Project

28. The project road is part of the main land transportation corridor to the Fergana region. Most fuel used by the nation comes from Fergana refineries; then shipped by road and rail to the rest of the country. The existing road was in very bad condition, resulting in a traffic slowdown and frequent stops and detours due to landslides and avalanches. The upgraded road is needed to insure that this transportation route is open year-round and provides efficient travel times between Tashkent, Namangan and Fergana.

29. The project will help to ensure efficient and safe truck and automobile routes in Uzbekistan, stimulating the construction of more local and regional linkages, facilitating economic growth at all levels.

2.3 Location

30. The project road begins 8 km from Angren City at an altitude of 990 and slowly climbs 2,200 m over the next 70 km until reaching the Kuram Pass at 2,200 m, then passes back down to 1,200 m above sea level within another 50 km (Map 2). Rising on both sides of the road are steep soil, gravel and rock.



Photo 1: The Akharangan River in relation to the project Road,
Km. 156, A373

slopes, some deeply cut by previous construction work. For much of the corridor the road is flanked by one steep side and the other dropping down the river floodplain (Photo 1). The river valleys and flood plains were strongly impacted by the new road (Photo 2).



Photo 2: Highway A373 Looking Toward Fergana, Km141. Note debris fall
into river

2.4 Size and Magnitude of Operation

31. Between 1996 and 2002 NH A373 was reconstructed. Some sections were straightened; highway spirals were created with the curve angles safe for transportation of full-size cars and

trucks. Two tunnels were constructed. The proposed work under the Tranche 1 of the facility will cover an 74 km long of road and 4 bridges with around 15 m width. The work will involve the replacement of the asphalt road surface with concrete and the paving of all shoulder areas.

32. Bridge rehabilitation will only involve the replacement of bridge decks. No work will be done outside these boundaries, other than for the temporary storage and processing of the ground-up asphalt at roadside sites. The work will extend from 2011–2014, requiring 5 contractors to work simultaneously on various sections of the road and specialized components such as the bridges (Photo 3). The concrete section will be completed by a single contractor.



Photo 3: One of the Four Bridges where Only Deck Resurfaced To Occur

33. The work will require the removal of >216,000 m³ of old asphalt (as ground up asphalt aggregate material), its processing and replacement as subgrade under the new concrete. An estimated 288,600 m³ of concrete will be laid. The two tunnels will receive new asphalt surfaces, requiring the placement of around 500,000 tons of asphalt. Given that much of the aggregate materials will be recycled and reprocessed as asphalt aggregate within 5 km of where it was removed,⁵ the area disturbed will be small.

34. Concrete will be mixed at a mobile batch plant, moved as the project proceeds. Only km 116–190 will be resurfaced in concrete, the rest will receive new asphalt. Km 123–137 (14 km) will not be touched as this section is already concrete, leaving only 74 km of road and shoulder to be resurfaced with concrete.

⁵ Asphalt material storage and reprocessing sites will be located at 8 or more roadside sites along NH A373. None can replace the vendors also operating on the roadside, unless specific contracts have been agreed to.

2.5 Project Layout and Components of the Work

35. The project will take place within the existing road RoW of approximately 60 m, with only the asphalt surface and shoulders disturbed. The work will generally consist of six tasks:

- a) removal and processing of the old asphalt and preparation of shoulders;
- b) replacement of faulty culverts and placement of some new culverts;
- c) removal surface materials from the bridges;
- d) placement of the reprocessed asphalt aggregate and fresh aggregate mixture as new sub-base material;
- e) construction of the surface drainage features on the road, namely ditches and storm runoff settling basins; and finally,
- f) the placement of concrete and/or asphalt on the road, bridges and shoulder areas.

36. It is anticipated that the entire upgrading of the 100 km will be contracted as five packages and that work will be ongoing simultaneously, starting sometime in 2011. Of these packages only one or two will be on the ADB-funded section. The others will be GoU-funded works on contiguous sections involving the placement of new asphalt.

3 Description of the Environment

37. The corridor of impact surveyed by the environmental team was 25 m on either side of the edge of pavement for flora and fauna (since no section of the work was outside the existing RoW), and 100 m for air, noise and water pollution. At places where A373 crosses the Akharangan and Rezaksai Rivers the width is increased to 100 m downstream of the crossing.

3.1 Physical Resources

3.1.1 Climate

38. Akhangaran District has an arid continental climate. It is characterized by long warm and hot period lasting from April till November, short cold period, small quantity of precipitation and also huge daily and seasonal temperature changes. Based on long-term meteorological observations, the average annual temperature is 14.3°C. The hottest month of the year is July with the average temperature of 33.6°C and maximum +42°C. In January average monthly temperature is – 3°C, down to a maximum lowest -18°C. Annual amount of precipitation varies between 420–720 mm, on the average reaching 560 mm. Maximum precipitation can be seen in winter-spring season. Precipitation is very rare from July to September.

39. The project road starts at km 108 at 1,100 m amsl, and rises to 2,200 m (km 175) then drops back down into a new watershed to 1,170 m. Much of the road is in an area of low altitude mountain valleys.

40. The project area has warm-short summers and cold and snowy winters, with frequent periods of thawing and snowing. These conditions, coupled by the use of salt during the winter, make the installation of road surface runoff facilities in order to avoid excessive discharge directly into rivers, very important.

3.1.2 Air Quality, Noise and Traffic

A. Air Quality

41. Located about 40 km downwind of the Angren coal-fired power plant and open-pit coal mining operation, the project area airshed is chronically polluted by these point sources, mostly with dust and NO₂. The local airshed is also polluted by contaminants from outside the study area, namely from neighboring countries. UZB has indicated that this transboundary pollution is frequently found in non-compliant levels in the project area. The traffic-related air pollution is added to these ambient conditions.

42. In 2011 the traffic volume was 11,600 PCU/24 hr (Table 2). The make-up of this traffic consists of 40–60 foreign manufactured cars/hr, 12–18 small CIS manufactured cars/hr, 4–5 mini buses (petrol and diesel)/hr, 4–6 trucks with petrol engines plus 10 with diesel engines with a load capacity of >10 tons. The traffic is dominated by passenger cars.

Table 2: Traffic Forecast for A373, Km 108–208

Table Traffic Forecast										
Year	Passenger Car	Minibus	Autobus	Small truck	Medium truck	Heavy truck	Articulated truck	International truck	Total Normal	Total Traffic PCU
	1	1	1.2	1.5	2	3	3	2.5	1.17	
2011	8837	6	20	211	145	348	346	1	9,914	11,559
2016	14232	9	32	340	233	561	558	2	15,967	22,339
2021	22920	15	51	548	376	903	898	3	25,714	35,978
2026	36913	25	82	883	605	1455	1447	4	41,413	57,943
2031	59449	39	132	1422	974	2343	2330	7	66,696	93,317
2036	95744	64	212	2290	1569	3774	3753	11	107,415	150,288

PCU= passenger car units per day; all types of vehicles normalized to passenger cars.

43. There will be elevated concentration of dust on the road since dust emissions are produced by vehicular traffic travelling on the dusty road. Since there is no other traffic entering or leaving the road section for the 80km project length, conditions are more or less the same and therefore only one air quality station was used in the EKOLOG modeling.

Table 3: A373 Ambient Air Quality 2011 (RRF. 2010 Feasibility Study)

2010-2011 A373, Traffic Vol:11,600 PCU; 200m wide Corridor	CO (mg/m ³)	NO ₂ (mg/m ³)	SO ₂ (mg/m ³)	Hydro- carbons HCO ₃	Exhaust Soot (mg/m ³)	Inorganic Dust* (mg/m ³) ≤ 20% SiO ₂	Inorganic Dust (mg/m ³) 20- 70 % SiO ₂
	Daily Avg	Daily Avg.	Daily Avg.	Daily Avg.	Daily Avg.	Daily Avg.	Daily Avg.
Km 116 only* (250,000 m ₂)							
Road center	0.08	2.51	0.01	0.1	0.03	0.346	0.40
100 M To North of C/L Toward Fergana	0.01	0.58	0.0	0.02	0.01	0.16	0.22
100m to South of C/L Toward Fergana	0.01	0.60	0.0	0.02	0.01	0.26	0.22
RoU Air Quality Standard	5.0	0.085	0.50	1.00	0.3	0.50	0.30

*Concentrations in g/sec. for an area of 500m x 500m centered over the road C/L, while standards are mg/m³

44. EKOLOG 3.2 (2006)⁶ is an air quality prediction model developed in Russia and widely used in the CIS countries for estimation and mapping of air quality conditions at varying distances from the source. It uses traffic, topographic, meteorological and other known point-source pollutant data to generate these estimates. In the case of the road, each parameter was estimated and plotted on a 500 m x 500 m grid, with the road running across the center. In this way concentrations of pollutants were plotted as contour lines at varying distances from the road centerline. For each parameter there were four plots made, one without the project and one with the project for 2011 and 2021. Under existing conditions only NO₂ and SiO₂ (20–70%) exceed the RoU standard (Table 3).

B. Noise

45. Existing condition noise was generated using the Dec. 2010 traffic volume based on actual counts, corrected for season and time (Table 2).

Table 4: Estimate of existing noise conditions on A373, 2010-'11

Location Along A-373	Year	Traffic Volumes AADT	PCU	Section Description	Avg. Speed of Traf. (kph)	Distance from roadside (m)	Noise Level Leq db(A).		Correction for % Truck Traffic/ (dBA)
							Day Time	Night Time	
Km 116	2011	9914 (1071 Trucks)	11,559	Representative of entire Section-mountainous	80	10	66	>65	10.8%, +3dba
				<i>With % truck traffic adjust.</i>			69	>68	
				Base estimate by RRF	80	100	60	60	
				<i>Add for %truck traffic</i>			63	>63	
RoU Standard				KMK 2.011.08-96, Noise Protection, Table. 2			65-70	<65	<i>Int'l norm is 55dBA for night standard</i>

Source: RRF EKOLOG Model.

46. Noise levels were estimated using nomogram defined in UZB KMK 2.01.08-96 as well as from Mulholland (1981)⁷. The estimates suggested that without any construction activity and within 10 m of the carriageway, noise levels always exceeded the national standard. At the 100m distance both day and night standards are being complied with.

3.1.3 Topography, Geology, Soils and Existing Erosion

47. Despite the fact that topography, geology and soils are not directly impacted by any project action, this section is presented in greater detail as it illustrates the very severe erosion conditions created by the lack of any environmental safeguards during the 1996–2002 road widening work undertaken by Uzavtoyul, and RRF's determination not to repeat such costly mistakes.

⁶ This model has been widely used across the CIS countries and Eastern Europe. Given the short time available, little verification of the model, other than 2 technical interviews with the model operator within the GoU. Further, given that the total construction activity for these 74 km road will involve not more 10 heavy construction equipment with working hours around 10 hours/day, it is therefore, the impact is not expected to be significant into overall airshed (the emissions stemming from the project is marginal). Therefore, the verification of the model and sensitivity testing were not considered necessary.

⁷ Mulholland, K.A. and K. Attenborough. 1981. Chapter 4, Surface Transport Noise (137pg) in. Noise Assessment and Control. Construction Press< Burnt Mills, Essex, UK.

48. The topography is steppes leading to low mountainous terrain with steep slopes down to the road which in winter are avalanche prone. Due to deep cuts to reduce the grade, the existing road has a shallow slope.

49. The geological features of the valleys through which the road passes are comprised of Paleozoic and Meso-cenozoic deposits. Paleozoic deposits are represented by crystalline rocks of volcanic materials: quartz porphyrites: quartz porphyries, tuffs, tuff-breccia and porphyrites. In addition to quartz porphyries contains grains of field spars. Igneous rocks to various extents are prone to the processes of deterioration and erosion. In general the Paleozoic materials are erosion project and when exposed to the elements become unstable.

50. Mesozoic deposits are represented by marmorized limestone, shelly limestone, chalky clays. Along the slopes of valleys there are crystalline rocks yields to the surface, but basically bedding rocks are closed from the top by deluvial pebble loam deposits. Deluvial deposits are represented by loess-like loams with addition of small rocks, debris and pebbles. Construction of the road entailed rock exposure, destruction of proluvial and deluvial slope deposits.

51. The project road, plus the government-funded asphalt sections (16 km) and the 4 km of existing concrete road, equaling 100 km (km 108–208) traverses the foothills and low elevation mountains, through and across the Akharangsai, Rezaksai, Kamchiksao and Ertoshsai River valleys. During the road construction work between 1996 and 2002, the extensive cutting into steep slopes, filling in of river floodplains and the permanent blockages of a number of small tributary inflows took place, permanently changing the erosion and surface runoff conditions of the project area. Further the extensive cutting with little concern for slope stability in the highly erosion prone Loess and gravelly soils (Photo 4), has resulted in extensive active erosion/landslide problems, sometimes closing A373 for days. This damaged areas have not been stabilized and reforested. The erosion and landslide area involves more than 320 ha. of land and is rapidly expanding with each rainy season. Of these 320 ha, about 120 ha exhibit highly unstable conditions with massive landslides possible at any time.

52. Between km 108 and 185 the road crosses the Chatkal and Kuramin mountains and then descends between km 185 and 208 across the erosion–scarred hilly piedmont plain toward the Fergana Valley.



Photo 4: Active Erosion and Slope Slippage Site, Km 119

53. Critical erosion conditions are between km 119 and km168 where the road passes along the sides of major river valleys and crosses the watershed divide. In addition to the damage caused by the road construction, over-grazing has left much of the roadside, highly erosion prone.



Photo 5: Slope Destablization and Slippage – Km 180; Due To Earlier Road Construction and Over Grazing

54. The repairs proposed by the RRF consultants, focus on stabilization of moving slopes, through the construction of concrete walls. While the other areas with less serious slope and erosion will be left without a slope stabilization.

55. The project road passess through a deeply incised river and the water has carved an ancient cannon, and has left alluvial deposit over thousand years. These changes have been caused by any known or recorded seismic activity. Construction of road in such unstable conditions within 1999–2002 without adequate protection measures has led to serious erosion problems.

3.1.4 Hydrology and Surface Water Quality

56. Flowing west from the Kumchik Pass, the Akhangaran River parallels the road alignment and crosses the road at it confluence with the Kamchik River on the south side of A373. The road continues over the watershed divide and then along the Rezaksai River which flows east. The road also crosses the Kizilsai River, one of the Rezaksai's tributaries. All rivers are fed by springs and snow melt water.

57. The Akhangaran River has a wide flood plain winding its way to the Angren reservoir. Run-offs starts in March with snow melt, reaching its highest levels in May, and flooding ending only in August. The dry season is from September through February, when rivers are fed only by groundwater upwellings. Minimum flow occurs in January. The annual average flow of the Akhangaran River is 23.3 m³/sec, with the majority (82.5%) occurring between March-July and within that period more than half between April and June.

58. The Rezaksai has a much narrower floodplain, cutting a deep trench as it makes its way out of the mountains.

59. The existing water quality conditions could not be provided in detail as such data are not collected for these rivers. It is safe to say that these rivers are contaminated with nutrients and bacteria from human and animal wastes as they pass through or near the 8 villages along its shoreline, from pasture lands draining into the rivers, livestock defecating into the water courses along the alignment, as well as surface runoff from NH A373 and its feeder roads.

60. These waters provide habitat for several fish species including several minnow, catfish and related species including the 'marinka' (or snow trout), a sought after sport fish.

3.1.5 Groundwater

61. The untreated storm and melt-water draining from the road surface is contaminating the local rivers as well as the groundwater. Based on the comments of local residents, wells near the road have been tainted by salt. These conditions seem highly probable given that along the project road about 42t of salt are applied each winter season per km of road, for a total of more than 3,860 t/season.

62. This finding makes better stormwater management a priority issue and will be pursued by RRF as part of this work and also as part of Uzavtoyul's road maintenance program.

3.2 Flora and Fauna

63. The project alignment and 25 m on either side of the carriageway has been completely disturbed by past construction, i.e., it has been dug up filled, cut and graded. There is no wildlife habitat in this zone. Outside this area and along the rivers, within 250 m of the road, wildlife exists, but given that this IEE was conducted in the middle of winter (temps averaging -6C), wildlife habitat or wildlife presence could not be confirmed. In contrast, the wildlife survey completed as part of the UZB Feasibility Study, contained an extensive section on wildlife, all from secondary sources, some dating back more than 20 years. That work suggested the possible existence of 16 rare and endangered species, as listed in the UZB's Red Book on endangered species (Table 5). The Uzbek specialist confirmed that this table was compiled using 15 year old data and that field conditions indicated that rare and endangered species were not an issue.

64. Non-endangered species living in the vicinity of the project road are: porcupine, fox, tolai hare, long-eared hedgehog, yellow ground-squirrel, common vole, dwarf hamster, house and forest mouse. Reptiles include the grey gecko, desert lidless skink, fast lizard, steppe agama, mountain racer, glass-lizard. Common birds are the crow, raven, lark, Asiatic quail, sparrow, barn swallow, turtledove, grackle, oriole, spotted flycatcher, Indian myna, magpie, nightingale, wagtail.

65. The Orsini's viper was known to exist in the low mountain slopes along the road; however, due to agricultural development and intensive animal grazing in the mountain-steppe zone this snake is now listed in UZB's "red book" as an endangered species.

3.2.1 Fish Resources

66. Much of the road parallels or is within the designated water protection area (riparian zones) of the Akhangaran, Kamchiksai, Kizilsai and Rezaksai, Rivers; a fact ignored during the 1996–2001 road construction. The Upper Chinarsai and Serkisai R. were seriously damaged by the roadwork and the confluences of these tributaries with the Akhangaran River were blocked by high embankments (these have never been removed). An initial interview with the Uzavtoyul Maintenance Dept. Manager, who has worked in the area for the past 14 years, suggested that three common species (sazam(carp); marinka (snow trout) and som (catfish) exist in the waters; none on the list in Table 5.

3.2.2 Environmentally Sensitive Areas, Rare and Endangered Species

67. The Akhangaran and Rezaksai Rivers parallel much of the 100 km of road to be upgraded. These rivers are not only habitat for native fishes such as the marlinka but also perch, carp, catfish and trout. These rivers are also potable water supplies for the villages located along the road. There are four bridges that cross the two rivers (2 bridges) and tributaries of the main rivers (2 bridges). How the decks are upgraded and how bridge runoff is managed will be important in improving the water quality of the main rivers. To that end RRF will instruct the Design Institute to provide deck runoff piping to divert runoff water to the shore instead of directly to the river.

Table 5: Species in Uzbek Feasibility Study Listed as Rare and Endangered

Common Name	Latin Name	UZB Red Book Status: 2004 R= rare, E=endangered	IUCN Red Book Status: 2011	Presence in the Project RoW
Reptiles				
Agama Toad	<i>Phrynocephalus strauchi</i> Nikolsky	R & E	No entry found	No
Rustamov plate-tailed gecko	<i>Teratoscincus scincus</i>	R & E	No entry found	No
Fergana desert lacerts	<i>Eremias scripta</i>	R & E	No entry found	No
Orsini's viper	<i>Vipera ursinii</i>	R & E	Vulnerable and decreasing	
Fish				
Sridarya Shovelnose Sturgeon	<i>Pseudoscaphirhynchus fedtschenkoi</i>	R & E	Critically endangered	No
Bream	<i>Abramis sapa</i>	R & E	Least concern	
Tashkent Water bleak	<i>Alburnoides odlongus</i> Bulgakov	R & E	Least concern	No
Redfin Pickerel	<i>Aspiolucius esocinus</i>	R & E	No entry	No
Turkistan barb	<i>Bardus capito</i>	R & E	Least concern	
Birds				
Turkistan white stork	<i>Ciconia Ciconia</i>	R & E	Least Concern	No
Asiatic Spoonbill	<i>Platalea leucorodia</i> Linnaeus	R & E	Least Concern	No
Bearded vulture	<i>Gypaetus barbatus</i>	R & E	Least concern	No
Mammals				
Marmot	<i>Marmota menzbieri</i>	R & E	Least concern	No

Reptiles

1. Toad agama – *Phrynocephalus strauchi* Nikolsky (sandy areas of desert, salty areas)
2. Rustamov plate-tailed gecko – *Teratoscincus scincus* (sandy areas, salty areas, piedmont areas with clay grounds)
3. Fergana desert lacerts – *Eremias scripta* (desert sandy areas)

Fish

4. Sridarya Shovelnose sturgeon-*Pseudoscaphirhynchus fedtschenkoi* (deep sections of river)
5. Bream – *Abramis sapa* (basins with sand-stone soils)
6. Tashkent water header – *Alburnoides odlongus* Bulgakov (shallow water areas of rivers with streaming water)
7. Pickerel asp – *Aspiolucius esocinus* (muddy waters of deep sections of river)
8. Turkistan barb – *Bardus capito* (flowing cold water sections)

Birds

9. Turkistan white stork – *Ciconia Ciconia* (oasis areas, fields, river banks, bogs)
10. Spoonbill – *Platalea leucorodia* Linnaeus (flat land water basins)
11. Bearded vulture – *Gypaetus barbatus* (middle and top mountain belts)

Mammals

12. Marmot – *Marmota menzbieri* (sections of mountain steppes close to streams, boulders and glaciers)

68. The UZB wildlife specialist, who completed this work, described where these species are unlikely to be found in the study areas. These findings concluded that these species will not be impacted by the project.

3.3 Economic and Cultural Development

3.3.1 Agricultural and Mineral Development

69. Along both sides of the alignment for its entire length, agriculture is restricted to subsistence farming, mostly sheep and goat raising. The land on both sides of the road shows extensive damage due to overgrazing. Most of the residents in the eight small villages located within 100 m of the roadside, have gardens and fruit trees for household consumption and local sale; sometimes along the roadside. There is no mineral development along this stretch of A373, but many village residents work at a coal mine located close to Angren Town > 16 km before the start of the ADB-funded section.

3.3.2 Infrastructure and facilities (drainage/control)

70. While 99% of village households have electricity, but supply is very intermittent, coupled with frequent power surges damaging appliances and generally reducing productivity. About 75% of the households have access to clean drinking water, but this is usually from one or several stand-pipes located in the village, requiring the use of pails to obtain drinking and washing water. The river water (Akharangan and Rezaksai) is also used for cooking and agriculture.

71. Around 96% of all households have access to sanitation; consisting mainly of outdoor pit privies and a few hand-flush toilets with septic tanks. Very few houses have water inside the home and heat is by either coal and wood burning stoves.

3.3.3 Industries and Employment

72. The following is a summary for the country, as data for the two regions were not available. In 2010 the total industrial output was 33.6×10^8 soums or an 8.3 % increase over 2009. Consumer goods production in 2010 grew by 12 % over 2009 outputs, of which food products accounted for 14% (8 % increase over 2009), and non-food products amounted to 19.4%, a 15% increase over 2009 (Table 6). Given that Angren and Namangan are economically depressed regions, their growth has been much lower if not negative, between 2009 and 2010.

Table 6: National Economic Growth by Sector 2009 and 2010

Sector of the Economy	Billion Soums	as % of January-December 2009
Electric power	2822.3	104.5
Fuel	6440.1	103.5
Ferrous metallurgy	823.0	105.8
Non-ferrous metallurgy	3783.9	99.1
Chemical and petrochemical	1702.1	115.4
Machinery and metal-working	5432.6	111.6
Woodworking, pulp and paper	360.6	107.0
Building materials	1674.8	108.7
Light	4489.1	117.3
Food	4231.9	113.1
Consumer goods	11262.8	112.0
Total	33580.5	8.3 %

Source: Statistical Review of Uzbekistan. 2010.

73. Aside from the Angren open-pit coal mine and the electrical power generating stations clustered around the coal mine, the economy is overwhelmingly agriculture, with livestock such as sheep, goats and cattle making up most of the enterprises. These operations function at a mostly subsistence level.

74. The construction of the road in 1996-2002 had serious negative effects due cutting off access from grazing areas and livestock barns, as well as restricting the movement of farm equipment and local residents. No compensation was provided and living conditions for the local population worsened, aside from the shorter travel time to major centers such as Angren and Namangan.⁸ RRF is determined not to repeat the same mistake, and will try to restore safe access across the highway for people, livestock and farm machinery.

75. In 2010 6.71 million persons applied to labor agencies for employment, a 2 % increase over 2009. As of the end of December 2010 there 162,000 people were looking for work, a decrease of nearly 4 % over 2009.

3.3.4 Social and Cultural Development

76. Akhangaran District has 4 vocational schools, 51 basic school, while Pap District has 71 basic schools, 9 vocational schools serving with 30,800 students. Statistics for Akhangaran are not available.

77. Pap District has 30,800 students, 71 basic schools with and 9 vocational schools. Basic schools are located in each of the 9 villages along the road, but the vocational schools are only in Chetsuv and Kushminor-Erzaksai (Table 8).

3.3.5 Population, Communities and Land Planning

78. The two regions the project road traverses are both economically and demographically different. Akharangan District is dominated by ethnic Uzbeks, while Pap District has mostly Takij people, resulting in culture and land use differences. Pap District is within Namagan Region which extends into the Fergana valley and as a result population density is nearly ten times that of Akharangan District (Table 7).

Table 7: Area, Population, Sex ratio and Population Density

Name of District	Area, Sq. km	Population			Sex Ratio M/F	Population Density No/km ²
		Male	Female	Total		
Tashkent Region	15,200	1251.3	1248.7	2,500,000.	50/50	43
Akharangan district	3,188	41,431	42,222	83,654	49.5/50.5	26
Namangan Region	7,900	986,900	983,100	1,970,000	50.1/49.9	249
Pap District	2,900	93,117	97,754	190,871	48.8/51.2	60

Source: IKS Social Impact Assessment, 2011

79. Pap's total population is twice that of Akharangan, yet its land area is 10% smaller.

⁸ The reduced travel time benefited mostly the large truck traffic, with little positive impact on the 8,700 people living along the road.

3.3.6 Socioeconomic Profile

80. **Akhangaran** – Akhangaran district has an extensive social and industrial infrastructure. It includes 471 km of natural gas transportation pipeline, 247 km of drinking water pipeline, some of 1900 economic entities, 600 farms, 1 hospital, This infrastructure serves 83,300 citizens registered in Akhangaran district.

81. **Pap** – The total population of Pap district is some of 190,000 people, 84% of them are living in rural and 16% in urban locations. There are 16 assemblies of citizens with 37,000 households and 50,000 families.

3.3.7 Public Health

82. **Akhangaran** – Akhangaran district has one hospital with 235 beds and 20 rural primary medical treatment facilities. There are few such facilities in the four villages located in Akhangaran District and along the road.

83. **Pap** – Pap District has 10 public hospitals with 850 beds, 37 polyclinics and 28 rural medical treatment facilities. There are also 12 private clinics with 91 beds and 33 pharmacies in the district. Beside that district operates 5 special health care centers. In 2010 there were in average 19 doctors and 85 nurses for each 10000 people. There are a few such facilities in the three villages located along the roadway in Pap District. 76.2% of the total population of the district is provided with drinking water, 99% with electricity and 88% with natural gas.

3.3.8 Recreational Resources and Development

84. The project corridor consists of very poor subsistence farmers who have little time for traditional recreation. No doubt there is a very lively community atmosphere and but no specific, specialized community development work going on. If the upgrading brings better road access to the villages and safer crossings for the people and livestock, a major benefit will have been realized. The RRF Design Institute is considering these requirements and designing these features as project enhancements.

3.4 Human Settlement in the RoW

85. Since nearly the entire road is in dry, mountainous and steep terrain, unusable for anything other than animal grazing, the population is clustered in and around each village. The eight villages along the road have a total population of approximately 8,669 people and a population density of 111/km², if one assumes an area of 1km x 78 km and an average HH size of 5.5 (Table 8).

Table 8: Roadside Village Statistics; Km 116–192 , National Highway A373

Name of the Rural settlement	Loc (km)	Number of Households	Population (5.5/HH)	Comments Re Crossings
Chinor	116	172	946	Need two Crossings
Serkakirildi	117	99	546	Need at least 1 crossing
Tangatopdi	119	132	726	Need Two crossings
Chetsuv	122	265	1456	Need 2 crossings and pedestrian way to school
Kuksaroy	132	102	561	Need at least 1 crossing
Ertosh	137	217	1194	Need two Crossing
Beshkul	141	122	671	Need at least 1 Crossing

Name of the Rural settlement	Loc (km)	Number of Households	Population (5.5/HH)	Comments Re Crossings
Kushminor and Rezaksoy	171	467	2569	Need at least 2 crossings and pedestrian way to school
Total in Sub-project area		1576	8669	111/km²
National				61/km²

Source: RRF, Note: density calculated using a 1000m x 78,000m, or 78 km² area.

86. The villages are traditional Uzbek and Tajik speaking settlements, with many of the men working, from time to time in the coal mines of Angren. Prior to the end of the Soviet Union, Angren was an industrial center overflowing with enterprises and work. Much of that industry is gone now, leaving the local village populations to return to the traditional farming and subsistence level livestock raising.

3.5 Archaeological and Historical Treasures

87. There are no known archaeological or historical treasures along the roadway

4 Impacts and Mitigative Measures

88. The impacts and mitigative measures are presented in detail in the EMP tables in Annex A. Each impact and mitigative measure is defined and cross referenced to the impact mitigation table (EMiT) and the Impact monitoring table (EMoT) using a letter. So for example 4.1.1 (B) is cross referenced to Annex A tables as Preconstruction phase impact and mitigative measure (B). The row in which (B) appears, in the EMiT table, includes details on what the impact is, what the mitigative action should be, as well as when, where and who is responsible for implementation of the measure. The monitoring table uses the same reference system, thus (B) would define the monitoring actions to be taken in response to the mitigative actions as defined in EMiT (B) to be implemented. This table also provides details in the monitoring actions, specific timeframe, location, reporting requirements and implementation responsibility.

89. The two tables have been designed to be used by contractors and others as a specific guide to mitigation and monitoring, and even inserted into contracts as an environmental clause.

90. The details of the EMP tables is not repeated in the following sections. Rather a number of the more important impacts and mitigative actions are described.

4.1 Pre-Construction Period: Project Location, Design

91. During this period most of the impacts relate to failure by the proponent to properly use the IEE documentation. This will be avoided through careful planning and environmentally friendly design considerations. In fact the recently completed Memorandum of Understanding-Fact Finding Document signed by the UZB and ADB defines significant environmental safeguard commitments (Sec. F para. 45 (v), (xvi) and para. 46 (v)) for RRF and firmly establishes the IEE and its EMP documentation as the central guiding specifications for environmental safeguard implementation and management for this MFF loan. Pre-construction measures are well represented. The eight potential impacts and mitigative actions identified in this IEE will be reflected in the detailed design period work and actions by RRF. Of the eight the six most important ones (A-D and G-H,) are discussed here. Details for each measure are provided in the Environmental Mitigation Table (EMiT) and Environmental Monitoring Table

(EmoT) of the Environmental Management Plan. The implementation of these measures will avoid and minimize a number of significant future impacts.

4.1.1 Inadequate Design Considerations Applied to Avoid Impacts

Environmental Safeguard Design for Not Implemented

92. On projects where large volumes of materials must be handled several times and where a large volume of truck traffic is involved, impacts can easily cascade from minor to significant. A good example is dust and noise which must be controlled throughout the work. By anticipating and preventing such effects from getting out of hand, the local environment is not overly damaged and there is a cost saving. RRF will therefore prepare a specific guideline for the contractor(s) to follow regarding site operations, materials handling and emission control.

Design Institute Does Not Fully Consider Road Runoff Situation and Does Not Design New Or Examine Existing Storm Water Management Facilities For Proper Operations.

93. During the consultation for this IEE, the issue of contamination of surface water supplies by road runoff, particularly salt-laden snowmelt was tabled as a local concern. Since, for nearly its entire length, this project road parallels either the Akharangan or Rezaksai Rivers, specific stormwater pollution control measures are needed. Uzavtoyul has in place a stormwater conveyance system, but it needs upgrading to reduce discharge of untreated water into the rivers which often serve as a village potable water supply or drinking water supply for livestock.

94. The RRF Design Institute will examine the existing road ditches and possible options for stormwater treatment given the very difficult, steep and rocky side slopes, and devise the best approach. Possible detention ponds at the bottom of the slopes or a vegetated barrier will be investigated. This will be most important along stretches where the road is within 100 m of the river. The upgrading work will be completed during the construction period.

The Design Institute Does Not Adjust The Design To Accommodate Pedestrian and Livestock Crossings At The 8 Villages Along The Project Road.

95. Participants at the consultations conducted by both the environmental and social teams, indicated an urgent need for specific pedestrian and livestock crossings along the road, at the road sections passing by the eight villages in the project corridor. At the moment there are no such crossings for the nearly 8,700 people, many small-scale livestock farmers, that live along the road. Uzavtoyul indicated there were two such underpasses, one at km 131 and the second at km178. The consultant inspected the structure at km 131 and reported it was a flood overflow stormwater culvert, partially filled in with the silt and gravel from the small stream flowing by. The culvert was being used as a local toilet.

96. The students making their way to school, for example to the area-elementary and high school in Chetsuv or Kushminor-Rezaosoy (km 122 and 171 respectively) from residential areas across the highway, must walk along and cross A373 to attend school, jumping over the concrete median barrier and walk along the shoulders to get there. The mountainous terrain provides few alternatives and the 1996–2001 road construction destroyed many of the small traditional paths used by villagers.

97. The RRF's Design Institute has already requested the 8 villages along the road to define where they want crossings for people and livestock. Understandably, there has been little response and therefore villages will be pro-actively consulted before final designs are prepared. There should be at least 1 crossing for every 500 people. Therefore, some villages will need at least 2 crossing sites (on-demand amber flashing lights and crossing areas). Livestock crossing locations will also take the form of on-demand flashing amber lights (solar powered). There will also be livestock crossing signage placed at all crossings.

98. Discussions with Uzavtoyul have established a number of important limitations to in-demand red lights, most importantly the problems with overloaded trucks not being able to start again after stopping and therefore blocking traffic.

99. Suggested solutions are to provide warning signs at the start of the mountainous section that new at-grade crossing structures have been installed for pedestrians and livestock and that some stops are likely and trucks should be able to stop and start on the grade. In addition to the road painting, signage is recommended such that when a light is about to be used an amber flashing light is activated 300m before the crossing, warning trucks to reduce their speed. By keeping the duration to under 2 minutes trucks will be able to slow down and time the light such that they will be able to continue without stopping. RRF will recommend that such a system be tested at the 4 most populated villages and if successful fully applied at all the villages.

18 Critical Erosion Site Rehabilitation Designs Not Prepared For Implementation by Contractor

100. During the 1996–2001 widening of A373, slope stability and erosion were overlooked, leading a very large scale erosion problem along the road, including massive landslides, slope slippages, huge gully erosion, and at some locations destabilization of entire mountain sides, where 'toe' materials were simply cut away during the widening work. The conditions are so bad that, there now is a constant danger of rock falls and road closures. Between 1998 and 2006, there were at least eight major landslides/mudslides closing A373 entirely.

101. To address this Uzavtoyul commissioned a special erosion protection study that identified about 18 or so serious erosion sites that needed immediate attention since the conditions were worsening each year. A general plan is in place and specific measures are being drawn up by the Design Institute and others. These designs will form a part of the construction work, but will be undertaken as a parallel project (not funded under the ADB loan), starting in mid 2011. The suggested solutions examined to date focus on traditional engineering works such as retaining walls and drainage control. The IEE consultant recommended the RRF to consider using bioengineering method which are effective, use local materials and can provide a significant number of local jobs. Several excellent guidebooks on methods exist, including J. Howell's roadside bioengineering site handbook (http://www.cd3wd.com/cd3wd_40/cd3wd/SOILWATR/H2079E/EN/B1364_2.HTM) and Reference Guide, written to address very similar erosion conditions in mountainous areas, as well as several other good and well illustrated documents, are available.

Failure to Plan For Containment Of Polluted Runoff Water From Asphalt Grinding Material Temporary Storage And Processing Site Along Project Road

102. The asphalt taken up by the grinding machine(s) will be temporarily stored at 8–10 roadside locations, mostly pull-out areas where now small vendors have stands for selling

snacks and home made goods.⁹ These are open flat areas at the edge of the embankment to the rivers which are from 50–200 m away. Each site is expected to contain around 27,000m³ of ground up asphalt and another 8,250m³ of crushed rock. The ground up asphalt contains very fine particles of asphalt, bitumen and the rock aggregate mixture other fines, which will all be washed down the slopes during any rain. Since these materials need to be mixed to ready them for placement as subgrade material, they will be repeatedly stirred, exposing new areas to washing by rain. It is estimated that between 1,200 and 1,500 m³ of fines and will be washed from each if these sites into the valley below and likely into the Akhangaran or Erzaksay Rivers.

103. To prevent or as a minimum mitigate this pollution RRF will instruct the Design Institute to design a simple drainage water containment feature for use by the contractors; that directs all runoff from these sites to a detention area before discharge down to the river. These detention areas can be placed on the benches below the storage sites. In this way, at least the larger fines will settle out and the water will be less contaminated.

4.2 Construction Period Environmental Effects and Proposed Mitigation

4.2.1 Air Quality and Noise

Dust

104. Along the entire 78 km of road, asphalt will be removed by heavy duty grinding machinery, generating large plumes of dust. The more than 210,000 m³ of 'asphalt-aggregate' will be handled at least three times and transported to and from storage sites, for placement as subgrade along the road. The offloading processing reloading and dumping as subgrade, will generate significant additional dust. There will also be dust generated by the aggregate crushing and concrete mixing plants, located along the alignment. Therefore, dust control/suppression measures will need to be planned for in advance by the project design team, as a way of avoiding construction period problems.

105. Dust control will be important for the grinding operations, and machines will need to be properly equipped. Water will be used to keep dust under control at the seven storage sites and the access roads from A373 specified. Dust suppression will be strictly adhered to within 300 m of any of the 8 villages located long the road, and levels will be restricted to standards found in KMK. Inspectors will be required to make regular checks and any dust clouds observed will be reported and considered a non-compliant event.

106. Another major source of dust will be the concrete batch plant(s). The batch plant(s) usually comes equipped with dust suppression equipment, which RRF will require. The majority of the rock crushing will take place at the Nerudnik Quarry located 45 km from Angren (16 km from the start of the project road section), and materials will be transported to Angren by rail and then trucked to the project.

107. In addition, mitigative measure will be implemented to insure that the location of any mobile batch plant is at least 1 km upwind or 500m downwind of a settlement. Noise suppression barriers and light baffles will be installed and all temporary batch plant sites will be

⁹ Relocation of vendors will be completed as part of the resettlement exercise, based on specific agreements reached and a relocation site prepared. The contractor will be instructed to only use these sites if nothing else is possible, in this way avoiding the relocation issue all together.

fully rehabilitated after abandonment. This restoration work will need to be completed within 1 week of a plant being moved and will involve bringing the site to pre-batch plant operations conditions.

Noise

108. The alignment will pass 8 villages (Table 8), all with hundreds of residences within 100–200 m of the roadside. The most intrusive noise will come from the grinding machinery, producing steady noise levels of 100 dBA within 50-60 m of the operation and >90dBA 200 m from the source, and during all hours of operation. Night time operations, when ambient noise levels are low, would accentuate the machinery noise, and perceptible noise correction factors of as much as 10dBA are added. Truck traffic at night will not contribute to the noise level, but to the sustained nature of the noise as this will be a 'line' as opposed to a 'point' noise source.

109. There are two mitigative actions which will be required a) limitation of operating periods to between 0700 and 1800 where the work is within 1 km of a settlement and b) making sure the all possible noise suppression measures are taken to limit the noise, including all sound baffling installed on the machinery and no operations outside specified standards.

110. RRF will purchase a portable noise meter to monitor the construction noise levels at a distance to the closest residence or occupied structure. The indicator applied will be the maximum L_{10} noise level measured over a period of not less than 15 minutes when the construction site is operating and at 50m, 100m and the distance to the nearest occupied dwelling. At these receptors, all attempts will be made to keep the construction noise level no more than 10dBA above background.

Other Air Pollution (Except Dust)

111. Construction period air pollution will include emissions from operating machinery. These emissions, mostly CO, NO₂, THC, diesel exhaust soot and dust (Table 9), will come from the heavy machinery, trucks and batch plant operations. A considerable amount of emissions arise from inappropriate operation of this machinery, e.g., long periods of idling when not in operation, operating poorly maintained machinery and vehicles or exceeding operating specifications of machinery.

112. The estimated construction period air quality levels, measured on the carriageway from the centerline of the road are more than double the without construction values. Aside from NO₂ and dust, the pollutant concentrations are rapidly diluted as one moves away from the immediate construction site. For example, while CO exceeds the standard at the center of the work site values quickly fall off and at 100m are well within the UZB standards. While for NO₂ shows that in all sampling areas the concentration is far higher than UZB standard (Table 9). However, the emission associated with the construction equipment that will mostly use diesel engines is not expected to significantly increase the concentration of NO₂.

Table 9: Estimated Construction Period Air Quality along Road

2011: During Construction. A-373, Traffic Vol:11,600 PCU; 200m wide Corridor	CO (mg/m ³) Daily Avg	NO ₂ (mg/m ³) Daily Avg.	SO ₂ (mg/m ³) Daily Avg.	Hydro-carbons HCO ₃ Daily Avg.	Exhaust Soot (mg/m ³) Daily Avg.	Inorganic Dust* (mg/m ³) ≤ 20% SiO ₂ Daily Avg.	Inorganic Dust (mg/m ³) 20-70 % SiO ₂ Daily Avg.
Km 116 -117 only: (250,000 m ₂)							
Construction :							
Road Centerline	0.2	2,8	0.02	0.28	0.09	0.346	0.40
100 M To North of C/L Toward Fergana	0.04	0.58	0.00	0.07	0.02	0.16	0.22
100m to South of C/L Toward Fergana	0.04	0.42	0.00	0.05	0.02	0.26	0.22
Per-Construction:	0.08	2.51	0.01	0.1	0.03	No data	No data
Road Centerline							
100 M To North of C/L Toward Fergana	0.01	0.58	0.0	0.02	0.01	No data	No data
100m to South of C/L Toward Fergana	0.01	0.60	0.0	0.02	0.01	No data	No data
RoU Air Quality Standard	5.0	0.085	0.50	1.00	0.3	0.50	0.30

113. The estimated total emissions per km of road for the construction activity was estimate (by the EKOLOG model) at between 0.317 to 1.0 t/km/yr, whereas for the existing road traffic in 2011 it was more than 46.0 t/yr/km. In other words an approximately 1.4% contribution by the construction to the total annual air pollutant loading along the project road during the 2012-2014 construction years.

114. To reduce emissions in general, limits for vehicle idling and equipment maintenance will be imposed throughout the construction period, with regular inspection and reporting by CSC inspectors. Equipment and vehicles will be shut off if not in use more than 3 minutes and all will be maintained according to manufacturers' specifications. Dust will be carefully and continuously managed. Air emissions will be monitored by visual inspection, focusing on dust and visible black smoke from operating equipment. Any vehicle exhibiting these conditions, usually due to poor maintenance, will be shut down and not permitted to operate again until a mechanic's certificate of repair is submitted to the CSC. The ST will have authority to do this.

115. The contractor will be required to remedy any observed/reported dust problem within 2 hours or face worksite shut down. These conditions and requirements will be enforced by the ST at all worksites.

116. Further any road used by the contractor where spills are accumulated, the contractor must clear up the roadway each day and be sure that dust, soil, sand gravel and rock is not on any of these roads. Non-compliance will involve penalty payment equal to the cost of clean up by a privately hired contractor, or roughly SUM 650,000 per day of work plus a penalty of another SUM 350,000 per day.

4.2.2 Water Quality and Hazardous Materials

117. There are four important construction-related impacts addressed in the EMP's EMI T.

Failure to adhere to construction related good housekeeping practices, including solid and sanitary waste management, leading to sewage and solid waste contamination of construction camps.

118. More often than not worksites, work camps and waste disposal facilities operated by contractors are a problem and end up costing the owner, in terms of fines and ultimate clean up costs. Major impacts stem from sub-standard sewage and garbage management and non-compliance with handling, transfer and storage of petroleum products at the construction work site(s).

119. All waste at construction camps/staging areas must be regularly processed and properly disposed in the plan areas for waste disposal (not in the down slope of the road edge). At the work camp (should there be one) a strict waste management plan (in compliance with UZB standards and norms) needs to be in force, including garbage, sewage and other wet waste processing. Sewage can be processed either by use of pit privies or composting toilets. For all other waste management the contractor will be required to enter into a contract with a local service provider and establish a regular disposal service—or provide this themselves. Failure by contractors to adhere to good housekeeping practices as defined in the contract Terms and Conditions and Conditions of Special Application and a lack of enforcement by the PMU, will lead to longer term contamination at construction camp sites, long after the work is complete.

Contamination Of Rivers With Sediment And Salt –Laden Snow Melt Runoff Water.

120. While not specifically related to construction activity, the contractor will be required to install and/or upgrade the storm and snowmelt water detention and treatment facilities along the project road, as designed by the RRF's Design Institute during the preconstruction survey of these facilities. This is essential as local communities have indicated having to use contaminated river water for drinking and livestock watering, and that some wells are contaminated with salt. Further the two main rivers are home to many fish species, one potentially endangered (UZB Feasibility Study).

121. The contractor will therefore examine all existing facilities installed for storm water management and upgrade these, as defined by the design institute, in order to provide adequate retention to permit the settling out of sediment and salt. Runoff must be allowed to percolate into the soil and eventually into the nearby rivers, paralleling much of the project roadway. Public safety and ease of maintenance must also be reported on by the contractor.

Inadequate Storages and Handling Of Petroleum Products By Contractor And Supplier Resulting In Spills to Surface Waters

122. For this project fuels and lubricants will be stored at the contractor's work/staging area(s) as well as the seven Uzavtoyul Maintenance Dept. Depots. 6,000-8,000 L of fuel may be stored at any of these sites at one time, most within 200m above either the Akhangaran or Rezaksai River. The contractor's yard will also be a vehicle service area, where lubricants, hydraulic fluids, diesel and petrol will be handled. Without a standardized petroleum materials handling and storage protocol in place, spills and contamination of nearby waters through surface runoff is likely (and may already be taking place). The failure to comply with a petroleum products handling protocol as well as inadequate storm water runoff treatment could easily lead to upper groundwater aquifer contamination, given that the soil is extremely porous and infiltration is rapid. Any contaminated groundwater will rapidly end up in the rivers.

123. The storage of all petroleum products must comply with the various UZB KMKs¹⁰. Each storage tank must be surrounded by an impervious berm capable of containing the volume of at least one storage tank. These storage tanks are likely at the existing 7 maintenance facilities along the road. This situation will not exempt them from inspection and upgrading to reduce the risk of damage due to an accidental spill(s).

124. Further, any fueling area must have properly operating fuel dispensing equipment in working order, i.e., not leaking. The fueling area must have a system for collection of all drips and spills during the fueling process. Changing of oil must always involve collection of waste oil for recycling. The contractor will be required to document the number of liters of waste oil recycled each month and provide evidence (waybill) that this was actually done.

Contractor Does Not Install Required Runoff Water Containment Features at Each Temporary Asphalt Material Storage Site Along A-373.

125. The contractor will be provided the design for the runoff water containment at the storage sites, as prepared by the Design Institute and will be required to install and maintain these throughout the use of the sites. The contractor will also be required to rehabilitate the sites once work is complete, including the clean up and removal of all asphalt material and the closure of any detention pits.

4.2.3 Soil Loss and Erosion

Landslides, Slope Slippage and Gully Erosion

126. Massive erosion problems exist all along the project road section, created by the previous GOU construction between 1996 and 2002. These represent serious hazards not just to the construction activity but for the road operations. These problems have resulted in frequent and long road closures. Without a serious effort to prevent further problems and to rehabilitate the 18 most severely affected sites, the slope failures and road closures will only become more frequent and costly. This is an indirect impact needing to be addressed in order that the road become safe and operational. RRF intends to use UZB budget to fully address this problem. Uzavtoyul has already completed a study to identify the most severely affected sites and a general rehabilitation plan. More specific action is urgently needed.

127. Using the 2010 report on the erosion problems between km 112–185 on A373 prepared by State Services for Monitoring Dangerous Geological Processes, approximately 18 sites will be re-inspected by experts from UZB, the contractor assigned to do the work, and/or a specialist invited by UZB to complete a rehabilitation task list for each site and immediately initiate rehabilitation. Both standard engineering as well as bioengineering solutions will need to be examined to check their suitability for project. (For bioengineering methods, the manuals such as those by Howell 1999 Roadside Bioengineering Reference Book and Site Handbook designed for Roads in Nepal could be used as reference because it involves a very similar problems and conditions as this region of Uzbekistan.¹¹

¹⁰ The contractor is expected to be fully knowledgeable about these KMKs and if not can consult with the RRF Environmental Safeguards Specialist in Tashkent.

¹¹ Handbook for bioengineering solution:
http://www.cd3wd.com/cd3wd_40/cd3wd/SOILWATR/H2079E/EN/B1364_2.HTM English only

128. Bioengineering is being suggested by the IEE consultant as it will be less costly, use local materials, has been tested and proven effective in conditions similar those along the project road and could provide employment for local people.

4.2.4 Health and Safety

129. Health and safety impacts and mitigative actions are defined in items 2.(iv) I-K of the EMI and address occupational health and safety, construction health and safety as well as pedestrian and livestock safety as this is the only all season roadway.

Increased Risk Of Vehicle-Pedestrian-Livestock Collision, Due To Absence Of Speed Limit Signs and Crossing Facilities

130. The five-year widening work on A-373 did not provide any provision for pedestrian or livestock crossing, despite the fact that the record of incidences grows every year as traffic increases. The resurfacing will aggravate this problem as now average speeds will likely increase and traffic volumes are expected to double in the next ten years to more than 25.7 thousand cars per 24 hours. Participants at both the social and environmental community consultations expressed a need to provide such crossings.

131. RRF will require the contractor to install speed limit signs according to UZB standard in terms of speed limit, size and interval of signs, within the road sections designated by local communities as crossing areas for both people and livestock. Pedestrian crossing structures will also be installed. The specifications for the design and location prepared by the RRF's Design Institute in consultation with the 8 local communities will be surveyed in and installed to provide safe crossing points for local citizens and their livestock. Crossings will likely involve on-demand amber lights and marked crossing areas, and signage, warning of crossings and stops ahead, in the eight villages.

132. If the road is to provide any service to the local communities there will need to be pedestrian crossings, livestock crossings and in the two villages with larger high schools, pedestrian walkways paralleling the road, keeping students off the carriageway.¹² The existing small market areas along the road will also need to be better developed, permitting safe exit off and entry to A-373 (see SIA and LARAP prepared by IKS for details). Livestock crossing the road has been observed along sections of A-373 passing by Chetsuv, Kuksaroy and Rezaksai.

133. During construction the work site will have flagmen controlling traffic at all times and assisting with pedestrian crossings.

4.3 Operating Period of Road

134. Five operating period effects are discussed; two of them, noise and air quality, are technically not needed since the project will not lead to any increase in traffic and should in fact reduce the emission per vehicle, due to better road surface, reduced travel time and reduce noise levels/vehicle. However, given their overall importance and increases due to traffic volume

¹² The TA consultant inspected one of the two 'underground walkways' constructed by RRF. The consultant concluded that the Chetsuv pedestrian way was actually a stormwater overflow culvert, used mostly as an outdoor toilet and not by pedestrians or animals. It was 20-30% silted in by past floodwaters,

growth, both these issues plus one other listed in the EMiT are discussed in here. Note that letters A–E refer to specific actions defined in EMP (Annex A).

4.3.1 Noise and Air Quality

135. With the exception of air, noise and stormwater quality, the operating impacts and mitigative measures all refer to inspection and maintenance, to be sure the mitigative measures installed during the construction period remain in running order. Of the six defined in the EMP, two are present in detail below.

Noise and Vibration Disturbance Due To Increases in Traffic

136. Since this project is not increasing the design capacity of the road, there is no project induced traffic volume increase and no traffic diversion, and therefore technically no need to address operating period noise. However, In the interest of completeness the following discussion on noise is presented.

137. Traffic volumes were collected only at Km 116 since there was only one traffic entry and exit point along this road section, permitting the assumption of a consistent traffic volume and mix along the entire 78 km. At present, the low AADT of 9,914 generates traffic noise at 10 m from the carriageway of around 66dBA during the day and approximately 65dBA during the night. If one adds in the correction for the nearly 11% truck traffic, 3dBA must be added, to yield 69 and 68 dBA (Table 10).

Table 10: Estimated Traffic Noise Levels at km116 of A373

Location Along A-373	Year	Traffic Volumes AADT	PCU	Section Description	Avg. Speed of Traf. (kph)	Distance from roadside (m)	Noise Level Leq db(A).		Correction for % Truck Traffic/ (dBA)
							Day Time	Night Time	
Km 116	2011	9914 (1071 Trucks)	11,559	Representative of entire Section-mountainous	80	10	66	>65	10.8%, +3dba
				<i>With % truck traffic adjust.</i>			69	>68	
				Base estimate by RRF	80	100	60	60	
				<i>Add for %truck traffic</i>			63	>63	
Km 116	2021	25,724 (2,794-Trucks)	35,978	Representative of entire Section-mountainous	90	10	72	71	10.8%, +3dBA
				<i>(includes Truck Traffic adjust.).</i>	90	100	68	67	
RoU Standard				KMK 2.011.08-96, Noise Protection, Table. 2			65-70	<65	Most Int'l norms use 55dBA as the night standard

Based on Mullholland and Attenborough (1981) Noise Assessment and Control, nomograph estimation of truck correction ; NS UZB KMK 2.01.08-96. Noise levels adjusted for avg. traffic speed and % truck traffic.

138. Future traffic projects after 10 years of operation were more than double the 2011 volumes, and as such the noise levels, with truck traffic adjustments included would increase to 72dBA during the day and 71 dBA at night for the 10 m distance and between 68 and 69dBA at

a 100m distance from the source. At this traffic volume Uzbekistan's KMK standard for night sound level would be exceeded by 3dBA, a barely perceptible change.¹³

139. After 2012 roadside noise levels will increase by a further 3+ dBA and night noise 100 m from the roadside will result in serious sleep disruption.

140. As a minimum, at the closest point between the road and each of the 8 roadside communities, RRF will undertake noise measurements during the 1st, 5th and 10th year of operation of the improved road to measure noise levels at the closest receptor (habitation), to establish the need for noise attenuation measures. The predictions suggest that noise levels in 2021 will remain around 69 dBA during the day and 63 dBA during the night (1.9 dBA below the UZB. standard). After 2021 noise will exceed the standards, particularly as truck traffic grows.¹⁴ These noise levels will be collected by the newly retained environmental specialist working within RRF.

141. Secondly, the speed limit along the road will be signed at 50 and 80kph as per UZB norms, with additional signage to limit the use of horns within 500 m of the village boundaries.

142. Vibration is not a issue for this project

Degradation of Local Air Quality Due To Increases in Traffic along Alignment

143. As with noise, changes in operating period air quality along the alignment will not be worsened by the resurfaced road. There will be no design capacity change or additions of access points, etc. In fact, a better quality, smoother roads surface will reduce the net air pollution, by reducing travel time. Therefore, strictly speaking it is not necessary to address operating period air quality, since the project, will not lead to increased traffic volume.

Table 11: Future air quality for 78 km Road Corridor, A373 (mg/m³).

2021: A-373 Traffic Vol:22,339 PCU; 200m wide Corridor	CO (mg/m ³)	NO2 (mg/m ³)	SO2 (mg/m ³)	Hydro- carbons HCO ₃ (mg/m ³)	Exhaust Soot (mg/m ³)	Inorganic Dust* ≤ 20% SiO2	Inorganic Dust 20-70 % SiO2
	Daily Avg	Daily Avg.	Daily Avg.	Daily Avg.	Daily Avg.	Daily Avg.	Daily Avg.
Km 116 -117 only: (250,000 m ₂)							
Construction : 2011 Road Centerline	0.2	2,8	0.02	0.28	0.09	0.346	0.40
100 M To North of C/L Toward Fergana	0.04	0.58	0.00	0.07	0.02	0.16	0.22
100m to South of C/L Toward Fergana	0.04	0.42	0.00	0.05	0.02	0.26	0.22
2021: Road Centerline	0.13	4.5	0.01	0.17	0.06	No data	No data
100 M To North of C/L Toward Fergana	0.03	0.94	0.00	0.04	0.01	No data	No data
100m to South of C/L Toward Fergana	0.03	0.97	0.00	0.04	0.01	No data	No data

¹³ A study by Eve Ohrstrom. 2000.(*Sleep Disturbance Caused by Road Traffic Noise.Noise and Sleep(8):pg71-78*) , studying sleep disturbance due to intermittent noise , found that waking from noise quadruples as ambient noise levels increase from 40-65dBA and intermittent sound spikes such as from passing loud trucks are generated.

¹⁴ The traffic engineers applied a 10.88%/5yr truck traffic growth constant, which may be somewhat of an underestimate, given that this road is the main connection to Fergana.

RoU Air Quality Standard	5.0	0.085	0.50	1.00	0.3	0.50 (g/sec)	0.30 (g/sec)
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Source:PDV Ecolog Vs. 3.3 modelling software, ECOLOG operated by RRF's Design Institute Consultant *

144. In the interest of completeness the probable air quality conditions based on traffic volume and mix are estimated and presented in Table 11. The estimates show a sizeable increase on NO2 but none of the other parameters are in violation of the UZB standard. Beyond 2021, as traffic doubles and triples, this situation will no doubt change.

4.3.2 Surface and Groundwater Quality

Ongoing Surface and Likely Ground Water Contamination Stemming From Faulty Stormwater Management System

145. During the construction period the contractor will be required to inspect, repair and upgrade any stormwater conveyance section that is determined to be faulty or substandard during the pre-construction inspection by RRF specialists. Uzavtoyul will need to examine these sections again as the operating period begins (as part of their monitoring tasks) and establish if faulty systems still exist and correct them immediately.

146. Surface and groundwater quality will be maintained at equal to or better than existing water quality conditions.

4.4 Irreversible and Irretrievable Impacts

147. This project will not generate any irreversible effects since it only involves resurfacing an existing road; no widening or realignments. During construction pollution will end once the work is complete and disturbed areas have been rehabilitated by the contractor.

4.5 Proposed Environmental Enhancements

148. There will be three environmental enhancements, discussed in detail earlier in the IEE. The first involves the repair of erosion damage caused by the previous construction work (Sect.4.2.2) which will impact the present project if not corrected. This work will be funded solely by the UZB national budget. The second enhancement will be the repair and upgrading of the existing stormwater management system (Sect. 4.2.3) in order to minimize contamination of local rivers and wells. The third enhancement will be the installation of better road crossings for pedestrians and livestock, initially on a pilot basis at the busiest locations, as identified by local residents (Sect. 4.2.4).

4.6 Social Sector Impacts

4.6.1 Social Assessment

149. The majority of survey respondents, road users and household owners, believe that the project will bring greater opportunity for general welfare improvement measuring both in business and job opportunities as well as greater access to basic public services such as education and health.

150. Local community members expressed concern with the road safety issues, especially in relation to pedestrians and livestock crossings in the villages. Attention to that issue seems to be one of the greatest challenges for the project.

4.6.2 Poverty Impact

151. The project will contribute to reduction of unemployment and generation of jobs during and after the construction. A number of additional jobs for skilled professionals could be created in organizations responsible for road maintenance. Construction process will create some demand for unskilled labor.

152. The one area offering not only construction but operating period local employment opportunities is the erosion protection work; not directly funded by the project but linked to the efficient operation of NH A373. This will be particularly true if bioengineering methods (see the Howell 1999 reference) for erosion control and slope stabilization are applied (as recommended by the TA consultant). RRF will instruct the Design Institute to examine bioengineering approaches and as a minimum apply them to a number of sites, using local materials and local labour.

153. The indirect impact of the project in employment may be in the form of expanded opportunities for self-employment in the trade and food catering sectors.

4.6.3 Resettlement

154. Observations and consultations with local authorities and project designers suggest that there will be no land acquisition. RRF specifies that vendors along the roadside should not be affected or closed during the construction phase. RRF will include clauses in the contract document that restrict construction work area to the carriageway and shoulders, without affecting the roadside vendors, unless written agreements have been filed (available for inspection by ADB).

5 Grievance Redress Mechanism

155. ADB requires that RRF establish and maintain a grievance redress mechanism to receive, facilitate and resolve grievances of affected people concerning the delivery of environmental safeguards at the project level, as defined in the assessment documents (primarily the EMP). The grievance redress mechanism will be scaled to the risks and impacts of the project.

156. The RRF's PMU, in cooperation with the regions' and impacted Districts, will establish Grievance Redress Committees (GRCs) at both levels. At the region level these will be comprised of the Khakim's representative, a representative of RRF and one member from the Region Environment Department. One member of the committee will be a woman. One person on the committee will be identified as the point of contact for any grievance claim. At the district level it will consist of a government official and two no-government members, one being a woman. GRCs established in each District affected by the road will be the most important. The GRCs will be in place before the start of the construction period.

157. Grievances can be filed in writing or orally with the GRC's district-level contact person. The committee will have 15 days to respond with a resolution. If unsatisfied with the decision the

complainant will be able to resubmit the grievance with the region GRC for final resolution, and at the same time submit a copy of the letter to the ADB project officer in charge. The region GRC will have a further 15 days to provide a decision, and if no ruling is forthcoming the grievance will be automatically decided in favour of the complainant and all compensation will be provided, within 30 days of that decision.

158. To be effective, the composition and operation of the GRC will be made known to the two project-area districts via a letter as part of the implementation of the EMP. The GRCs composition and availability will also be posted at all Hokimiyat offices. This will be in addition to the fully translated IEE going to the regions and districts, as promised at the consultation session.

6 Information Disclosure, Consultation and Public Participation

159. One consultation session was held in Rezaksai, Namangan Region. The presentation focused on introducing the project to all people attending, specifying an implementation timetable, defining the work to be done and inviting comments on any concerns omissions or issues from the attendees. This meeting was announced in a newspaper on February 14th (see Advertisement in Annex B), three days before the consultation date (See Annex B).

160. The presentation (See Annex D) was delivered using PowerPoint slides in Russian, while the delivery was in Uzbek (standard procedure in Uzbekistan), with some additional translation into Tajik. The presentation was approximately 60 minutes long, followed by an open question and answer period lasting from 30 minutes and then proceeded by a lunch.

161. The session was held on Feb 18th. Attendance was 41 people with a good mix of professions, political organizations as well as womens groups were represented (see Annex D for a listing). Two of the people attending the session were women.

162. As part of the presentation, brochures describing the project were distributed and a two maps showing the road corridor and the proposed erosion repair work were displayed in the wall of the earthen floored meeting room.

6.1 Summary of Comments by Participants

163. The comments by participants focused on provision of pedestrian and livestock crossings and the repair of faulty stormwater management system, since the water quality of the Rezaksai was continuing to degrade. There was also a question regarding provision of mobile phone tower and whether a mobile emission testing station will be installed at km 108 and 208 to check compliance with vehicle emission norms.

164. None of the participants objected to the project, nor had any specific comments regarding negative impacts, other than the stormwater and pedestrian crossing issues.

165. The team indicated that recommendations were being made to install pedestrian and livestock crossings and that local communities needed to provide input re best locations. Further the team indicated that RRF would conduct an inspection of the existing stormwater management system, installed several years ago, assess its effectiveness and make any necessary repairs.

166. The consultant's team informed the participant of the proposed major control program, but there was little reaction by the consultation participants. The team then reminded the participants that the IEE work would come to a close during the early part of March and that comments were urgently needed.

6.2 Use of Consultation Results

167. The consultation materials were used to follow up on stormwater management systems, prompting another field visit to establish the status and secondly to examine an existing underpass and discuss other locations. Consultation was also undertaken with the social safeguards team. These materials have become the basis for the actions to install more pedestrian and livestock crossings, and improve the road's stormwater management system.

6.3 Follow Up Program

168. The follow up activity to the consultation was another field trip to examine previously installed stormwater management systems; principally the detention ponds, an existing pedestrian and livestock underpass, to view potential new pedestrian and livestock crossings and to discuss the asphalt material storage procedure with Uzavtoyul. This work was completed and findings incorporated into this IEE.

7 The Environmental Mitigation and Monitoring Action Plan

169. The impacts and mitigative measures are presented in detail in the EMP tables in Annex A. Each impact and mitigative measure is defined and cross referenced to the Impact Mitigation Table (EMiT) and the Impact Monitoring Table (EMoT) using a letter. So for example 4.1.1 (B) is cross referenced to Annex A tables as Preconstruction phase impact and mitigative measure (B). The row in which (B) appears, in the EMiT table, includes details on what the impact is, what the mitigative action should be, as well as when, where and who is responsible for implementation of the measure. The monitoring table uses the same reference system, thus (B) would define the monitoring actions to be taken in response to the mitigative actions as defined in EMiT (B) to be implemented. This table also provides details in the monitoring actions, specific timeframe, location, reporting requirements and implementation responsibility.

170. The EMP identifies the mitigation and compliance monitoring requirements, including specifying how, when, where and by whom, the mitigation and monitoring is to be carried out during the three key phases of the project; the preconstruction or planning and design period, the construction period and the operating period. The mitigation and monitoring actions will be implemented by (i) RRF during the pre-construction period and its (ii) PMU or contractor during the construction period, and (iii) Uzavtoyul and its Regional Maintenance Dept. during the operating period. All actions are defined in detail in the EMP's Mitigation Table (EMiT) and Monitoring Table (EMoT), found in Annex A, Tables 1-2. Both tables are self explanatory and have been prepared such that they can be used as environmental clauses in the contract documentation and as monitoring checklists. The action items in the IEE text, the EMiT and EMoT are all numbered and fully cross referenced. Sections 7.1 and 7.2 summarize the mitigation and monitoring actions defined in the two tables.

7.1 The Environmental Mitigation Table (EMiT)

7.1.1 Preconstruction Period

171. Key actions listed in the EMiT (Annex A, Table 1) for the preconstruction period (seven) include the need to confirm that environmental safeguards have been specifically considered in the construction planning and operation in order to avoid negative impacts. Secondly RRF has committed to including designs of pedestrian crossings, sighted in cooperation with the 8 local communities. Thirdly RRF has committed to undertaking and inspection of the previously installed stormwater management system and recommend improvements and upgrades as required. Finally the RRF will confirm that the IEE and its EMP are properly translated and distributed to regional and district officials and made available for review by community citizens in the Hokimyets' offices.

7.1.2 Construction Period

172. During construction, mitigative measures (14) focus in ensuring that contractors undertake all their work in an environmentally responsible manner, properly disposing of wastes, controlling the handling, use and storage of fuels and lubricants, revegetating/rehabilitating any sites cleared during construction, protecting the surface waters during bridge resurfacing actions and during the handling of asphalt grindings.

173. A number of mitigative measures to reduce noise and air quality degradation during construction are specified; particularly for the sections of road passing by the eight villages. These actions include limiting working hours, dust control, vehicle maintenance, and sound baffles and being aware that construction dust must be managed as it can travel long distance. RRF will be the lead for this work, with its PMU and CSC completing the mitigative and monitoring actions.

174. RRF will insure that the storage of asphalt material taken from the road and temporarily stored will not displace vendors now using the roadside, until an agreed to relocation site has been identified. RRF will prepare written agreements with the vendors to be relocated, defining the compensation and relocation site(s). No relocations will take place until such arrangements and agreements are signed and become legally binding.

175. The RRF and the specialist contractor(s) will be responsible for the extensive erosion control measures to be undertaken, hopefully preventing future mass landslides, continued gully erosion and slope slips leading to road closers. The consultant has strongly recommended that, in addition to traditional engineering designs, bioengineering erosion control measures be applied to some of the 18 badly damaged areas. RRF will carefully review this recommendation since it could mean cost savings and possibly local employment.

176. Further the contractor will be required to implement any stormwater management improvements defined during the preconstruction inspection completed by RRF's Design Institute.

7.1.3 Operating Period

177. The five operating period mitigative actions focus on ensuring that key mitigative measures are carried over from the construction period into the operating period and that the

pedestrian/livestock crossings and stormwater management systems remain functional, doing what they were designed to do. Uzavtoyul's Maintenance Dept. will also need to conduct regular inspections of the erosion control works and make any remedial repairs.

178. As this work is purely resurfacing with no changes to road design capacity or access, neither operating period air quality or noise are relevant .since the repaving has no negative effects. The consultant has however provide an quick analysis and recommended mitigative measures for controlling traffic related air and noise issues as the traffic volume begins to build, around 2012. The consultant has also recommended the use of portable tailpipe emission testing equipment as an enforcement tool. Interestingly, Regional Uzavtoyul officials also recommend this, with testing sites at km 108 and 208.

7.2 The Environmental Monitoring Table (EMoT)

7.2.1 Pre-Construction Period

179. The EMoT (Annex A, Table 2) lays out the monitoring and reporting requirements that RRF is committed to overseeing during the same three project phases as shown in the EMiT. The EMoT defines seven pre-construction period monitoring actions, 14 during the construction period and six operating period monitoring requirements; matching the mitigative measure in the EMiT. Most important during the pre construction period will be the consistent and regular monitoring the project design team, ensuring that preconstruction engineering actions to avoid/limit environmental impacts are implemented, including the stormwater system inspection and redesign as need the planning and design of the road crossings as well as the elaboration of the erosion control program. Verification that IEE documentation has been translated and distributed will be another important task.

180. The contract documentation will be examined by the CSC staff to verify that appropriate environmental safeguards have been added as contract specifications.

7.2.2 Construction and Operating Period

181. The EMoT table defined 14 construction period monitoring tasks. These tasks will deal mostly with compliance monitoring of the following construction-related actions:

- dust and construction air quality management at construction sites, including the concrete batch plant(s);
- enforcement of noise control measures;
- general good housekeeping activities by the contractor at all construction sites, including petroleum products handling, storage and use;
- erosion control measures implementation (NOT PART OF ROAD RELATED WORK BUT NEEDING TO BE DONE);
- necessary stormwater management works underway
- pedestrian and livestock crossings under construction;
- inspection of agreements with vendors to be relocated and documentation re sites.
- inspection of installation of speed limit and other relevant safety signage, particularly in the vicinity of the 8 villages; and,
- confirmation that both OHS and CHS measures as defined in Uzbek standards and norms are being adhered to by the contractor(s).

182. During construction the work related emissions will be insignificant compared to the total emissions from the existing road traffic, so that air quality from the work is a minor issue, needing little follow up aside from the ensuring that measures defined in the EMiT fully implemented.

183. Monitoring during the operational period will concentrate on assuring that the mitigative measures implemented during the construction period are fully implemented and maintained. There are six operating period monitoring actions required. Maintaining and monitoring the ongoing progress with the erosion control measures installed during the construction period will be a essential task, conducted in parallel with the IEE monitoring tasks. Monitoring and maintaining the stormwater pollution control measures, especially confirming the proper operation of the measures installed to limit any further pollution of nearby rivers with contaminated (mostly with suspended sediment, salt and heavy metals) meltwater and stormwater runoff.

184. Although the project has no effect on noise or air quality changes resulting from increased traffic volume, the consultant addressed both issues in some detail to assist RRF and Uzavtoyul in the future air quality and noise management on A373. The consultant has recommended that a portable (Type-2) sound meter be purchased for use during the construction and the operating period. During construction the meter will be used to measure sound at construction sites and contractor yards. If sound is more than 10dBA above background levels for any averaged 15 minute interval, the contractor will be required to reduce the noise level by any means. During the operating period the meter readings will determine the extent and level of noise mitigation required for residence and facilities impacted by excessive noise.

185. The recommendation of the consultant to purchase at least one and possibly two portable tailpipe emission testing units for use during the operating period will be discussed within RRF, Uzavtoyul and with ADB to establish the procedures and funding to implement such a program along A-373.¹⁵

186. RRF will instruct it PMU, the CSC and Uzavtoyul that the monitoring timetable included as column 4 in both the EMiT and EMoT will need to be adhered to. Key timetable elements are:

- a) During the preconstruction period monitoring will be as required, e.g. inspection of the relocation agreements and relocation sites prior to start of construction, and other measures designed to avoid future impacts;
- b) During the construction period monitoring will be every 3-4 months, based on a timetable prepared by the RRF and its PMU, and/or as specified in the EMoT, using the IEE as a baseline document, for the 2-year construction period. This will be in addition to the daily construction inspection. Construction period monitoring must be completed at the time the contractor signs off on the work.
- c) Operational period vehicle emission testing should be twice a year and become an annual operating task for Uzavtoyul. Noise measurements will be completed as a minimum, during operating years 1, 4 and 10.

¹⁵ During the consultation meeting the question of the establishment of two such inspection stations was tabled by the Regional Uzavtoyul office, with no prompting or prior discussion with the consultant.

187. RRF will implement the consultant's recommendation to continuously monitor the operation of the stormwater management system, and the pedestrian and livestock crossing function, as well as the proper maintenance of speed limit and other safety signs along the road.

8 Performance Indicators

188. The single most important indicator used to assess whether the IEE and its EMP have been useful is the extent of degradation of the environmental conditions from pre construction to the operation of the road. The result is acceptable¹⁶ if measures defined in the EMP are complied with and there is no observed significant degradation. Column 3 of the EMoT defines the required reporting for each pair of mitigation-monitoring activities. The completion and availability for inspection of these reports, checklists and confirmation notes, will be a second major performance indicator. The consultant suggests that these reporting requirements be consolidated into a monitoring checklist consisting of all mitigation-monitoring actions and the compliance statements as defined in the EMP, then used as the basis for the safeguards section of the mandatory semi-annual progress report to the ADB. Non compliance will be acted on by RRF or PMU within four working days of non-compliance being reported.

189. Compliant noise levels, based on meter readings, controlled dust levels through suppression measures and a low level of non-compliance, plus the purchase and use of a Type-2 Sound level meter will be a clear indicator of success.

190. If tailpipe emission testing does take place another excellent indicator will be the steady reduction in emission levels due to better maintenance and fuel and the use of catalytic converters.

191. Proper ST monitoring and consistent reporting, establishing a clear record of timely environmental mitigation and monitoring associated with periodic due diligence inspection, will be the best record of how effective the IEE was/is.

192. RRF will strive to deliver this level of environmental governance.

9 Implementation Arrangements

193. Implementation arrangements for environmental safeguard measures are critical to completing a fully compliant set of mitigation and monitoring actions. These are stated in the Environmental Management Plan's EMI and EMoT. As soon as possible after the IEE has been approved, RRF and its PMU or consultant will prepare a chart defining who is responsible for the submission of compliance monitoring reporting during all three stages of the project. Essential actions will be:

- a) During the detailed design stage, the IEE results need to be examined for guidance in helping engineers design-out and prevent environmental impacts. For this to occur the RRF will ensure that all IEE documentation, particularly Environmental Management Plan(EMP) are translated into the local language and distributed to all stakeholders, namely the Design team, Program Management

¹⁶ In the context of this IEE, acceptable means remaining within Uzbekistan standards and norms and within ADB basic guidelines on environmentally acceptable change—as defined in SPS-2009

Unit(PMU), Region and District officials as well as the Contract Supervision Consultant(CSC)

- b) Design changes and credible actions related to vendor relocations;
- c) During the bid document preparation, environmental clauses reflecting the environmental impacts and mitigative measures defined in the IEE documentation, must be inserted;
- d) Once construction is about to begin, the contractor, working closely with the PMU and its CSC, must prepare an action plan for implementing the mitigative measures defined in the IEE's EMP.
- e) RRF will insure that safeguard inspectors are on the job at the start of the construction period and the regular monitoring and reporting as required in the EMoT is undertaken; and,
- f) RRF will insure that all reporting is done in on time and in a consistent manner, with documentation available for review by ADB at any time.

10 Capital and Re-Occurring Mitigation and Monitoring Costs

194. Only cost directly related to the project or costs associated with actions needed to keep the road operational (minus the very large erosion protection works) were included in the estimates. Assumptions about national specialist fees, ranging between 60 and US200/day and 700/day for internationals were applied. Absolute minimum international time was budgeted.

195. Total environmental costs for all capital cost items will likely be USD62,900, and for re-occurring costs it will be USD45,160. Broken down among the three project stages it will be (Table 12): preconstruction -\$27,982, construction -\$63,680 and operations \$16,400, plus a 6% contingency. This cost includes the sound meter and a single tailpipe emission testing unit.

Table 12: Estimate of Costs for Mitigation and Monitoring, Plus Unusual Costs

Item	Amount
Total Mitigation and Monitoring By Period (US\$)	
Pre-Construction Period (<8 months)	27,982
Construction Period (2 years)	63,680
Operating Period (3 years plus)	16,400
SUB TOTAL	108,062
Contingency @6% of Total	6,484
Total Minus Unusual Capital Costs	124,546
Unusual Expenses	
Road Crossing Hardware	60,000
Watering Truck	12,000
Total for Unusual Capital Costs	72,000

196. Below the total cost line in Table 12 are the other 'unusual costs' including the hardware for the on-demand crossing structures and the used watering truck to be used for dust suppression on the road and at the asphalt chip processing sites.

10.1 Cost of Social Development Programs and Resettlement

197. At the time this IEE was completed the social costs of the project were not available.

11 Conclusions and Recommendations

11.1 Conclusions

198. While involving only the removal of asphalt material from 80km of road using special grinding equipment and resurfacing the road with concrete, a number of potentially serious environmental impacts have been identified. These involve mostly the failure to repair past damage and failure to install proper pollution control measures addressing past and future pollution of the area surface waters.

199. The past road widening work exposed many km of roadside slopes to serious and active ongoing erosion, slope slippage and landslides. These problems are serious enough to have resulted in at least one major road closure (for several days) each year since 2002.

200. The resurfacing work will generate >200,000m³ of asphalt material which will be stored at 8-10 roadside dump sites. This material will contain large volumes of fine materials and bitumen dust, all discharged directly into the nearest surface water, namely either the Akharangan or Rezaksai Rivers, two protected watersheds. No provision has been made to contain this runoff.

201. In addition, surface runoff from the existing and the newly resurfaced road is not treated and will flow almost directly into the two rivers, given that much of the road sits above the river on a fill-embankment (Photo 2). This is of considerable concern as the snowmelt water contains large quantities of salt and heavy metals accumulated in the snowbanks over the winter, released in to the rivers during the spring melt. After that each storm will bring further pollution from the first flush flows.

202. When the road was rebuilt, it was transformed from a two lane road to a 4-lane divided highway. No provisions were made for crossing facilities for either people or livestock, making getting across the road serious safety concern the local people underscored to both the environmental and social safeguards team.

203. Construction and operating period noise was shown to exceed night-time standards and may create a problem for some of the 8 roadside villages.

204. A similar situation may occur for air pollution as traffic (there is no project-induced traffic increase) builds, particularly after 2015. RRF will consult with Uzavtoyul and ADB to establish the feasibility of initiating a vehicle inspection program on either side of the mountain pass, including tailpipe emission testing. For that work RRF would purchase at least one portable tailpipe emission testing unit.

11.2 Recommendations

205. RRF will instruct the contractors, the PMU and Uzavtoyul to implement all mitigative and monitoring measures defined in the EMP. RRF will express the importance of timely and complete reporting, whether checklists, letters or short reports, to all project participants and inform all stakeholders that reports will be inspected by ADB every 6 months. RRF has also agreed with the following recommendations made by the TA consultant:

1. RRF will instruct the PMU to confirm that the mitigative measures at the 18 erosion sites are being implemented and that the most serious sites will be less of a danger and the risk of road closures will be significantly reduced. RRF will encourage the Design Institute to consider using bioengineering to address the gully erosion and slope slippage problems.
2. To protect the two main rivers from being polluted by the runoff from the 8-10 temporary asphalt material storage and processing sites, a simple berm and runoff detention system will be designed by the Design Institute. Instructions on installation will be given to the contractor. In turn, the contractor(s) will be required to provide written notice that the berms have been erected at each site while in use and that a complete rehabilitation is complete after the site no longer needed. These notices will be included in the semi-annual report to the ADB.
3. Much of the road sits above the rivers on a fill-embankment (Photo 2), and therefore untreated melt-water and stormwater flows almost directly into the two rivers. Snowmelt water contains large quantities of salt and heavy metals accumulated over the winter, and are released into the rivers during the spring melt. After that each rain storm will bring further pollution from the first flush flows. Recognizing that the Akharangan and Rezaksai Rivers are nationally protected watersheds, RRF will instruct the Design Institute and Uzavtoyul to provide simple detention measures such that the surface drainage is detained for at least 24 hours before discharge into the rivers. This can be done by construction of earthen berms at the base of embankments, which direct the runoff to detention basins at the base of the slopes. RRF will prepare semi-annual progress reports on this work and will require Uzavtoyul to include semi annual inspection of these facilities.
4. The lack of any crossing facilities for either people or livestock, making getting across the road serious safety concern has not been addressed adequately. RRF will instruct its Design Institute to again consult the local communities and establish the 4 most active crossing areas and install on-demand lights, including amber warning lights 300m from each crossing. In addition, the new road section will be signed at both ends warning all users that crossing structures have been installed and stops may be necessary at the four locations. Uzavtoyul will be required to maintain and monitor these sites to determine usage and effectiveness.
5. Although not directly resulting from the resurfacing, traffic and traffic noise is expected to increase and exceed the existing UZB standard as traffic builds beyond 2015. RRF will purchase a portable Type-2 sound meter, and use it to monitor noise at the 8 roadside villages, focusing on the houses, schools closest to the road. Appropriate mitigation be provided to this houses where the noise exceeds the UZB standard.
6. A similar situation exists for air pollution and RRF will discuss options with Uzavtoyul, Traffic Police and the ADB, with a view to possibly establishing vehicle emission testing stations at either side of the mountain pass at km 108 and 208.

206. Finally, if the measures defined in the EMP and the in Sections 11.1 and 11.2 are completed, RRF recommends that no additional environmental studies are needed, and concludes that the project should meet both UZB and ADB environmental safeguard requirements.

ANNEXES

- Annex A: Table 1-Environmental Management Plan: Mitigation Actions (EMiT)
Table 2-Environmental Management Plan: Monitoring Actions (EMoT)
- Annex B: Newspaper Announcements Published in Local Newspapers in Angren
- Annex C: Consultation Brochure that was distributed
- Annex D: Consultation Meeting Minutes and Attendance Sheets
- Annex E: Presentation Given in Rezaksai (Russian Text and Uzb. Delivery)

ANNEX A: THE ENVIRONMENTAL MANGEMENT PLAN (EMP)

Table A-1: Environmental Mitigation Table (EMiT)

Environmental Impact/Issue: as listed in IEE	Mitigative Measures	Location ²	Time Frame	Responsibility	
				Implementation	Supervision
1. PRE-CONSTRUCTION PERIOD					
i. Inadequate Design Considerations to Avoid Impacts and Failure to use IEE Documentation					
A) Environmental safeguard design for acceptable construction operations not implemented	Design construction to avoid having to build any new access roads and to plan materials transport to the site by rail and then truck, in an environmentally friendly manner. RRF will prepare a guideline for contractors that will specify: protocol for transporting of materials on public roads, operating timetables, operation of materials distribution sites and clean up. This report or checklist will be available for inspection by ADB.	For application along the entire project sites and any haul roads	During project design period	RRF its PMU and consultants	PMU
B) Design Institute does not fully consider road runoff situation and does not design new or examine existing storm water management facilities for proper operations.	The RRF Design Institute will examine the existing road ditches and stormwater settling basins and determine adequacy, measured as size large enough to retain a 48 hr snowmelt. Any under-sized basins identified and resized and become a part of the construction activity	All road	During project design period	RRF's Design Institute	RRF ,its PMU and Consultants
C) The Design Institute does not adjust the design to accommodate pedestrian and livestock crossings at the 8 villages along the project road	The RRF Design Institute has already requested the 8 villages along the road to define where they want crossings for people and livestock. Villages will be pro-actively consulted before final designs are prepared. There must be at least 1 crossing for every 500 people. Therefore, some villages will need at least 2 crossing sites (on-demand amber flashing lights and crossing areas). Livestock crossing locations will also take the form of on-demand flashing amber lights (solar powered)	At the 8 villages	During project design period	RRF's Design Institute	RRF ,its PMU and Consultants
D) 18 critical erosion site rehabilitation designs not prepared for implementation by Contractor	Special UZB government project under way to address this.Work is starting in late 2011, with planning and design well underway. Funding fully from the UZB national budget, but project implementation is essential for proper road operation.	At the 18 identified severe erosion sites identified in this EMiP and shown in the report	Starting in 2011	RRF	Design Institute and Specialist Contractor(s)
E) No distribution of IEE and EMP documentation-translated into local language	RRF will ensure that the IEE, its EMP and all parts of the safeguards documentation is translated into at least Russian and will be distributed in both hard and soft copies to the following stakeholders: the (i) PUI, (ii) PMU, (iii) Contract Supervision Consultant, (iv) Contractor, (v) District and (vi) Regional officials. A set of documents will also be placed in the Hokimiyat office and an announcement placed on the bulletin board announcing the availability of the IEE for viewing.	District office and contractor	Prior to the start of construction period	RRF, its PMU and CSC	PMU
F) Failure to include environmental clauses in contract and/or covenants in loan agreements, defining mitigative and monitoring actions	Prepare environmental contract clauses for contractors' contract Terms and conditions and Conditions of Special Application section of standard documentation—using the EMP and monitoring plan as guides. Prepare an environmental loan covenant that binds Uzavtoyul/Road Fund to implement the EMP and monitor according to the Monitoring Plan and to show proof that the work has been completed, via bi-annual reporting. In defining the “bill of quantities” provide specific environmental items against which interim payments can be tagged—and withheld for non-compliance	NA	Before construction begins	RRF, its PMU and consultants	PMU
G) Failure to provide guidance on containment of runoff from asphalt grinding material storage sites along the roadside	RRF will instruct the Design Institute to design a simple drainage water containment feature for use by the contractors, that directs all runoff from these sites to a detention area before discharge down to the river. These detention areas can be placed on the benches below the storage sites. In this way, at least the larger fines will settle out and the water will be less contaminated.	For use at the 8-10 temporary roadside storage areas	Completed prior to the start of construction	Design Institute	RRF

Table A-1: Environmental Mitigation Table (EMiT)

Environmental Impact/Issue: as listed in IEE	Mitigative Measures	Location ²	Time Frame	Responsibility	
				Implementation	Supervision
2. CONSTRUCTION PERIOD					
i. Air Quality and Noise					
A) Excessive construction related dust from grinding operations	78 km of asphalt will be removed by heavy duty grinding machinery, generating large plumes of dust. The offloading processing reloading and dumping as subgrade, will generate significant additional dust. There will also be dust generated by the aggregate crushing and concrete mixing plants, located along the alignment. Dust control will be important and for the grinding operations. Suppression equipment on the grinding machines and dust control at the storage sites located at the 7 existing maintenance facilities along the project road will be specified. Access roads from A-373 to the sites will also require dust control during the hauling operations. Dust suppression will be strictly adhered to within 300m of any of the 8 villages located along the road (IEE Table 8.).	Anywhere, where along the road grinding operations take place, at the storage areas and access roads	Construction period	Contractor	Contractor Supv. Engineer, PMU and region-level inspectors
B) noise and air pollution from concrete batch plants	RRF's ;contractor plans to use two new mobile concrete batch plants, dedicated to providing concrete for the road surfacing. These plants will be equipped with dust and noise suppression equipment, but will still be noisy and create dust that will be of concern to area settlements. To avoid this, plant sites will be selected at least 500m downwind and 1000m upwind of any settlement. Noise suppression barriers and light baffles will be installed and all temporary batch plant sites will be fully rehabilitated after abandonment. This restoration work will need to be completed within 1 week of a plant being moved and will involve bringing the site to pre-batch plant operations conditions.	Anywhere along the new alignment	Construction Period	Contractor	Contractor Supv. Engineer, PMU and oblast-level inspectors
C) excessive construction period noise	<p>The alignment will pass past 8 villages (Table 8) All these areas have hundreds of residences within 100-200m of the future roadside.</p> <p>The most intrusive noise will come from the grinding machinery, producing steady noise levels of > 100 dBA within 30-40m of the operation, and during all hours of operation. There are two mitigative actions which will be required a) limitation of operating periods where the work is within 1 km of a settlement to 0700-1800 and b) making sure the all possible noise suppression measures are taken to limit the noise.</p> <p>RRF will purchase a portable noise meter to monitor the construction noise levels at a distance to the closest residence of occupied structure. The indicator applied will be the maximum L₁₀ noise level measured over a period of not less than 15 minutes when the construction site is operating. All attempts will be made to keep the measurement no more than 10dBA above background levels.</p>	Km 116. Chinor; Km117 Serkakilirdi; Km119 Tangatopdi; Km 122 Chetsu; Km132 Kuksaroy; Km137 Ertosh; 'Km 141 Beshku; Km 171 Kushminor & Rezoksoy	Construction period	Contractor	RRF and its PMU and CSC
D) Excessive construction-period air pollution namely dust and emissions from construction vehicles	<p>Construction period air pollution will include emissions from operating machinery. These emissions, mostly THC, TSP, SO2 and NO2, will come from the heavy machinery, trucks and batch plant operations.</p> <p>To reduce emissions in general, controls of vehicle idling and equipment maintenance will be imposed throughout construction period, with regular inspection and reporting by CSC inspectors. Equipment and vehicles will be shut off if not in use more than 3 minutes and all will be maintained according to manufacturers' specifications. Dust will be carefully and continuously managed. Air emissions will be monitored by visual inspection, focusing on dust and visible black smoke from operating equipment. Any vehicle exhibiting these conditions, usually due to poor maintenance, will be shut down and not permitted to operate again until a mechanic's certificate of repair is submitted to the CSC. The ST will have authority to do this.</p> <p>The contractor will be required to remedy any observed/reported dust problem within 2 hours or face worksite shut down. These conditions and requirements</p>	At all work sites where construction equipment is operating, and especially near the 8 villages, ad defined in item C) above and in Table 8.	Throughout the construction period	Contractor	Construction Supv. Engineer and PMU

Table A-1: Environmental Mitigation Table (EMiT)

Environmental Impact/Issue: as listed in IEE	Mitigative Measures	Location ²	Time Frame	Responsibility	
				Implementation	Supervision
	will be enforced by the ST at all worksites. Further any road used by the contractor where spills are accumulated, the contractor must clear up the roadway each day and be sure that dust, soil, sand gravel and rock is not on any of these roads. Non-compliance will involve penalty payment equal to the cost of clean up by a privately hired contractor, or roughly SUM 650,000 per day of work plus a penalty of another SUM 350,000 per day.				
ii. Water Quality and Hazardous Materials					
E) Failure to adhere to construction related good housekeeping practices, including solid and sanitary waste management, leading to sewage and solid waste contamination of construction camps	All waste at construction camps/staging areas must be regularly processed and properly disposed of. At the work camp (should there be one) a strict waste management plan needs to be in force, including garbage, sewage and other wet waste processing. Sewage can be processed either by use of pit privies or composting toilets. For all other waste management the contractor will be required to enter into a contract with a local service provider and establish a regular disposal service—or provide this themselves. Failure by contractors to adhere to good housekeeping practices as defined in the contract Terms and Conditions and Conditions of Special Application and a lack of enforcement by the PMU, will lead to longer term contamination at construction camp sites, long after the work is complete. .	Any construction site or activity which is the responsibility of the contractor	Throughout the construction period	Contractor	RRF's Construction Supv. Engineer-PMU
F) contamination of rivers with sediment and salt –laden snow melt runoff water	The contractor will examine all existing facilities installed for storm water management and upgrade these, as defined by the design institute, to accommodate adequate retention to permit the settling out of sediment and salt, and the permitting the treated water to percolate into the soil and eventually into the nearby river, paralleling much of the project roadway, without failing too quickly. Public safety and ease of maintenance must also be reported on by the contractor	Along the entire road section where these stormwater management systems have been built and where they should be installed.	Throughout the construction period	Contractor and Construction-period inspectors	Contractor Supv. Engineer, PMU and oblast-level Govt. inspectors
G) Inadequate storages and handling of petroleum products by contractor and supplier resulting in spills	The storage of all petroleum products must comply with the various UZB KMKs. Each storage tank must be surrounded by an impervious berm capable of containing the volume of at least one storage tank. These storage tanks are likely at the existing 7 maintenance facilities along the road. This situation will not exempt them from inspection and upgrading to reduce the risk of damage due to an accidental spill(s). Further any fueling area must have properly operating fuel dispensing equipment in working order, i.e., not leaking. The fueling area must have a system for collection of all drips and spills during the fueling process. Changing of oil must always involve collection of waste oil for recycling. The contractor will be required to document the number of liters of waste oil recycled each month and provide evidence (waybill) that this was actually done.	All construction Yards and with contractor's fuelling equipment	Throughout construction period	PMU	Contractor
H) Contractor Does not Install required runoff water containment features at each temporary asphalt material storage site along A-373	The contractor will be provided the design for the runoff water containment at the storage sites and will be required to install and maintain this throughout the use of the site. The contractor will also be required to rehabilitate the site once work is complete, including the clean up and removal of all asphalt material and the closure of any detention pits.	At all 8-10 temporary storage sites	Prior to the start of operations of any storage site and on completion and closer of each site during construction	PMU	Contractor
iii. Soil Loss and Erosion					
H) Along the project road section massive erosion problems exist, created by the pervious GOU construction between 1996 and 2002. These represent serious hazards and have resulted in road closures.	Using the 2010 report on the erosion problems between km 112- 185 on A-373, by the State Services for Monitoring Dangerous Geological Processes (Available from RRF) 18 sites with dangerous erosion will be rehabilitated. Both standard engineering as well as bioengineering solutions will be undertaken, with bioengineering methods examined from detailed manuals such as Howell. 1999.Roadside Bioengineering Reference Book and Site Handbook, designed for Roads in Nepal with very similar problems and conditions. For free download, go to http://www.cd3wd.com/cd3wd_40/cd3wd/SOILWATR/H207	AT 18 severe erosion, landslide, slope slippage sites as shown in the special report and summarized in Map in special Report and Error! Reference source not found.	Throughout the construction period as part of the work	RRF, Design Institute	Specialist Contractor

Table A-1: Environmental Mitigation Table (EMiT)

Environmental Impact/Issue: as listed in IEE	Mitigative Measures	Location ²	Time Frame	Responsibility	
				Implementation	Supervision
	9E/EN/B1364_2.HTM				
H.1 Inappropriate disposal of unusable construction material leading to erosion and loss of fines	All removed asphalt will be reused, as sub-base material and some of the existing sub-base will be removed. These sites will be flat areas or blind depressions, or existing excavation sites and will be full restored once filled in and the deposition is complete	As identified by the contractor	Throughout the construction period as part of the work	RRF, Design Institute	Contractor
iv. Health and Safety					
<i>Occupational Health and Safety</i>					
I) Injury and health problems due to lack of OHS guidelines	RRF will make certain that OHS measures as defined by UZB norms and standards are incorporated into construction contracts with the successful bidders. Compliance will be verified with relevant contract clauses being available for ADB audit. RRF will use the World Bank/IFC OHS guidelines to supplement national standards	Throughout the construction area	At all times during the construction Period	Contractor	PMU and RRF
<i>Community Health and Safety</i>					
J) Injury, health degradation and loss of life due to poor or no CHS practices	RRF will require the contractors to always provide adequate alternate traffic movements, manage dust through watering and sweeping, and manage traffic at any construction site that interferes with main roads used by local communities.	At all work areas along the road	At all times during the construction Period	Contractor	PMU and RRF working closely with the Police
K) Increased risk of vehicle-pedestrian-livestock collision, due to absence of speed limit signs	At present the project road has 2-3 small speed limit signs. During roadside interviews drivers have indicated that signs are needed to control speed. To that end RRF will require the contractor to install speed limit signs according to international standard in terms of size and interval	Along the entire project stretch of road	Installation during the construction period.	Contractor	PMU, RRF and Police
v. Pedestrian and Livestock Safety					
L) Failure of the contractor to build the pedestrian and livestock crossings according to the design specifications and according to the needs of the 8 villages	The design and location specifications prepared by the RRF's Design Institute in consultation with the 8 local communities, will be surveyed in and installed to provide safe crossing points for local citizens and their livestock. Crossings will likely involve on-demand amber lights and marked crossing areas, and signage, warning of crossings and stops ahead .	At the 4 or so villages defined in IEE Table 8, located within 300m of the carriageway	During the construction period after repaving is complete	Contractor in consultation with local authorities	PMU, RRF and Police, in consultation with local authorities
vi. Implementation Infrastructure					
M) General Failure of the EMP and resulting environmental damage	The value of the IEE and its EMP depends almost totally on credible and consistent compliance monitoring, reporting and enforcement of requirements. A weak process or marginally committed administration will lead to failed impact mitigation and monitoring program or unacceptable and unreliable results. RRF has included in its staffing plan for the PMU, a Safeguard team (ST), and will also retain international environmental expertise within the CSC. RRF is fully committed to ensuring that the contract meets all IEE requirements and undertakes all mitigative actions. Should none compliance items not be rectified in the time specified in this IEE or by the ST, RRF will penalize the contractor to the extent specified in this IEE and as defined by law.	The entire construction area	Throughout construction period	PMU	Contractor
3. OPERATIONAL STAGE					
i. Air Quality and Noise					
A) Noise and vibration disturbance due to increases in traffic	<u>There are no traffic increases due to the project so technically no mitigative actions needed</u> . Our consultant recommended that as a minimum, at the closest point between the road and each of the 8 roadside communities, RRF undertake noise measurements during the 1 st , 4 th and 10 th year of operation to measure noise levels at the closest receptor (habitation), to establish the need for noise attenuation measures. The predictions suggest that noise levels in 2021 will remain around 69dBA during the day and 63 dBA during the night (1.9 dBA below the UZB. Standard). After 2021 noise will exceed the standards, particularly as truck traffic grows. These noise	Eight Villages as defined in Table 8 of the IEE	Within Year 1 of the start of the operating period	RRF	Uzavtoyul

Table A-1: Environmental Mitigation Table (EMiT)

Environmental Impact/Issue: as listed in IEE	Mitigative Measures	Location ²	Time Frame	Responsibility	
				Implementation	Supervision
	levels will be collected by the newly retained environmental specialist working within RRF. Secondly, the speed limit along the road will be signed at 90kph, with additional signage to limit the use of horns within 500m of the village boundaries.				
B) Degradation of local air quality due to increases in traffic along alignment	There are no traffic increases due to the project so technically no mitigative actions needed However, our consultant has recommended that Uzavtoyul purchase 1 or portable exhaust emission analyzer for petroleum and diesel engines (3 to 4 well known brands available), and undertake a testing program along this new road. Test failure will require vehicle owners to surrender their registration to police and provide certificate of repair within 10 days or receive a large fine (based on UZB. Norms and standards), but should be at least SUM 500,000. Further RRF will encourage Uzavtoyul and police to enforce speed limits and vehicle inspection, requiring vehicles >10 years old to have annual emissions tests and to require all heavy vehicles, including large trucks and buses to have emission control devices installed.	Minimum two sites selected from the 8 villages the road passes	Within Year 1 of the start of the operating period and continuously thereafter	RRF	Uzavtoyul
ii. Surface and Groundwater Quality					
C) Ongoing surface and likely ground water contamination stemming from faulty stormwater management system	Uzavtoyul's Maintenance Dept. will be required to examine the detention pond system during years 1 and 2 of the operation of the resurfaced road and record the stormwater/melt water conveyance and detention capacity of the system in a checklist report, on each detention pond. Standing water and infiltration will be observed and reported on. Any faulty system will be repaired within 1 weeks of record.	All along the 78 km road section and at all detention basin sites	Every year as part of the regular annual inspection and maintenance cycle	Uzavtoyul, Tashkent	Regional Maintenance Dept. of Uzavtoyul
iii. Erosion and Soil Loss					
D) Erosion and Degradation at the 18 revegetated and rehabilitated sites	See Monitoring Table	All revegetated and bioengineered sites along the road (the 18 special erosion control locations)	For three operating period years	RRF	Uzavtoyul
iii. Implementation Protocol					
E) Contractors do not prepare Mitigation Completion report and PMU fails to provide a Operating stage mitigation timetable for Uzavtoyul's Regional Maintenance Dept. leading to stop in mitigation and monitoring actions, and their maintenance	The contractor is required to prepare a Mitigation/Monitoring Completion Report, which must be submitted to RRF for transfer to Uzavtoyul's unit which will operate the road, in order that they can follow up with mitigative measures such as revegetation, initiated by the contractors. Should this not take place, the entire EMP and monitoring program is in jeopardy. RRF and its PMU is committed to making certain that the contractor carries out this task and will provide guidance Measures to continue into the operating period will be the maintenance of revegetation areas and confirmation of the record of the decommissioning of any work areas, such as the roadside asphalt storage sites, work camp sites including waste dumps, etc and the sealing/securing of wells newly dug for use during the construction period. The RRF will ensure that this happens	NA	Mitigation report completed before contractor received final payment and implementation schedule when operations begin	Contractor with help from RRF's PMU and later with operating unit of Uzavtoyul responsible for that section	Uzavtoyul in cooperation with RRF's PMU

Letter designation for each impact in column 1 is cross referenced to the IEE text as well as the monitoring Table (EMoT) of the Environmental Management Plan (EMP); **PMU**-Program Management Unit

CSC-Construction Supervision Consultant; **RRF**-Republic Road Fund; **ST**- Safeguards Team within the PMU

PCU-passenger car units

Table A-2: The Environmental Monitoring Actions table (EMoT)

ITEM	Monitoring Details	Required Reporting	Timing	Executing Unit	Report-ing Responsibility
1. PRE-CONSTRUCTION (DESIGN) PERIOD: all confirmations & reports submitted to RRF's PMU: available for ADB compliance audit					
i. Commitment to and Application of IEE Documents and Outputs					
A) Confirm that environmental safeguard design for acceptable construction operations have been implemented	Prior to the completion of the design work the PMU and their consultant will complete an audit to ensure that environmentally sound design and construction measures have been integrated in the detailed design and bid documentation	None	Prior to the end of the detailed design work	RRF and the CSC or PMU	RRF
B) Confirm that Design Institute has considered road runoff situation and has corrected any design faults and added new designs for storm water management facilities where needed.	RRF to ensure that stormwater management improvements/specifications are included in the contract design drawings and documentation for application by the contractor	None	Prior to the end of detailed design work	RRF and the CSC or PMU	RRF
C) Confirm that the Design Institute has included, community-approved pedestrian and livestock crossings at the 8 villages along the project road	RRF to provide a written notice that provision for at least 10 pedestrian and livestock crossings have been provided for in the redesign of the project road section	Written notice on file	Prior to the end of detailed design work	RRF and Design Institute	RRF
D) Confirm that IEE and EMP documentation translated into Russian and local language, distributed to Regional Uzavtoyul's and Hokimiyat offices	RRF, with the help of the Supv. Consultant, is to provide draft environmental clauses and specifications based on the EMP, for inclusion in bid documents and the Loan Agreement; or Use the EMP as the reference document	Clauses included in bid documents	Prior to bids and signing of Loan Agreement between ADB & RRF	RRF, and their consultant(s)	RRF
E) Confirm that environmental clauses and/or covenants are included in contract documentation defining mitigative and monitoring actions	RRF to certify that a qualified environmental safeguards specialist(s) are participating in the project monitoring activities for the construction period AND that environmental safeguard clauses are included in the contract documents	RRF to provide written copies of safeguard clauses as defined in contract docs.	Near end of Pre-construction period	RRF and until preparing the contract terms and conditions	RRF
2. CONSTRUCTION PERIOD -prepare and use a monitoring checklist					
i. Air Quality and Noise					
A) Monitor compliance with dust control measures defined in IEE	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.	Weekly inspection reports	Every day, throughout the construction period	Contractor and RRF or PMU inspectors	RRF
B) Inspection of concrete batch plants and surrounding sites to insure compliance with sighting requirements and noise and air pollution control measures	Safeguard monitor to report on location of batch plant and advise PMU head if non compliant. Insure that proper noise suppression and light baffling is in place. Inspect batch plant site after abandonment and rehabilitation. As well, noise measurements via a portable noise meter to be taken 4X/day for one day a month every two months of operation. If levels are found acceptable, noise measurements can be terminated. At the same time visual observation on dust from the plant must be recorded. These measurements must be taken at 10m distance from the source and at the nearest receptor; i. e., closest house.	Plant sighting and closing report, plus monthly noise and dust observation records	At start of plant	PMU's safeguard inspector and Contractor	RRF

Table A-2: The Environmental Monitoring Actions table (EMoT)

ITEM	Monitoring Details	Required Reporting	Timing	Executing Unit	Report-ing Responsibility
C) Enforce construction period noise controls	PMU inspectors to confirm that work times in the vicinity of the 8 villages (Table 8) are restricted to 0700-1800 and that construction vehicles have been properly maintained and have manufacturer installed noise suppression equipment in operation (e.g., mufflers). Noise measurements with portable sound meter to be taken. PMU will inspect contractor's equipment fleet maintenance record to insure there will be no unnecessarily noisy equipment in operation in the vicinity of the 8 villages (and assoc. schools).	Inspection checklist confirming operating hours and equipment maintenance	Throughout the construction period	PMU and safeguard monitor	RRF
D) Enforce construction-period air pollution mitigation measures, namely, idling restrictions, dust and emissions from construction vehicles	PMU inspectors to document that contractors vehicles do not idle for more than 3 minutes when not in use. Monitor to record dust suppression and haul road cleaning by contractor. Monitor is to report any visible black smoke from equipment or contractor yard. Non-compliance and/or failure to clean up spilled materials or dust on roads will be reported, and the contractor charged for services of others to clean up in the range of SUM 1,000,000/day. PMU will work with the traffic police to enforce these fines.	Air pollution monitoring checklist for dust and black smoke , compliance with idling rule and equipment maintenance	Inspection as part of the weekly construction inspection	Contractor and PMU inspectors	RRF
ii. Water Quality and Hazardous Materials					
E) Inspect and enforce construction related good housekeeping practices, including solid and sanitary waste management, leading to sewage and solid waste contamination of construction camps—as defined in EMI	Undertake regular good housekeeping tasks as defined in the EMP and provide monthly monitoring checklist to RRF's PMU. Use the EMI as the basis for the checklist. Non-compliance will result in PMU retaining others to do this work and costs will be deducted at a rate of SUM 1,100,000. per day of non compliance	Monitoring checklist report by Safeguards Monitor	Every day throughout construction period	Contractor and PMU Safeguard monitor	RRF
F) Inspect stormwater pollution control measures; both existing and upgraded, and new component to be sure they function properly and actually detain snowmelt and first flush storm events reducing the pollution load to rivers .	RRF will assign specific task to Safeguards monitor to inspect progress on stormwater pollution control measures, confirming that existing facilities are operating properly and repairs, replacements and new construction is ongoing.	Checklist identifying each stormwater detention area and short statement about its status relative to operations	AT every stormwater detention facility from km 116-198	Contractor and PMU Safeguard monitor	RRF
G)Enforce UZK KMK's re storages and handling of petroleum products by contractor and supplier ,in order to prevent spills and pollution	Inspector to document compliance with relevant Uzbek KPKs re fuel storage and handling. Secondly inspection that fuel dispensing does not lead to leaks and drips on ground. Third requiring contractor to provide receipts of waste oil collection for recycling	Waste oil collection receipts and observations on fuel storage and dispensing (no chronic leaks and ground contamination in yards)	Inspection as part of the weekly construction inspection	Contractor and PMU inspectors	RRF
iii. Erosion and Soil Loss					
H) Monitor the rehabilitation of the 18 major erosion sites , created by the pervious GOU construction between 1996 and 2002, and for which rehabilitations plans have been developed.	Special project Under RRF and Design Institute direction. UZB national budget—not ADB	Specific erosion control monitoring reports, with photos: twice a year	At all 18 erosion control sites	Contractor and specialist consultant-geologist/soils expert	RRF
H-1) Monitor the proper placement of spoil material and the site rehabilitation once disposal is complete	As part of the regular construction inspection cycle the inspector will be required to report on the status of any established disposal sites and establish a monthly photographic record of their maintenance, couple with a monthly checklist	Monitoring checklist defining preparation, operation and rehabilitation of such sites	Any used sites	Contractor	PMU

Table A-2: The Environmental Monitoring Actions table (EMoT)

ITEM	Monitoring Details	Required Reporting	Timing	Executing Unit	Report-ing Responsibility
iv. Health and Safety					
<i>Occupational Health and Safety</i>					
I) Enforce UZB OHS guidelines as defined in standards and norms	RRF to keep on file relevant contract clauses demonstrating the insertion of these into the contract documents; available for ADB audit.	Throughout the construction area	At all times during the construction Period	Contractor	PMU and RRF
<i>Community Health and Safety</i>					
J) Inspect and confirm that crossing structures and features are installed as agreed that they are fully functional at the end of the construction period	RRF to provide a listing of amber cross walks, flashing lights in the 8 villages, signage and other safety features planned for the road and will prepare a checklist noting location and operating details, including signage and lighting.	Throughout the construction area, with focus in 8 villages as shown in Table 8.	At all times during the construction Period	Contractor	PMU and RRF working closely with the Police
K) confirm the installation of speed limit signs	RRF, through its contractor/consultant will prepare a list of signage locations along the road and will provide a photographic example if the speed limit sign placement	Table listing signs and km location; both directions	Completed by the end of the construction period	Contractor	RRF
L) Inspect placement and construction of all livestock crossing features along the road, according to the needs of the 8 villages	RRF, through its contractor or consultant will review design drawings/instructions re livestock crossings and will prepare a completion checklist for each village (Table 8).	Throughout the construction area, with focus in 8 villages as shown in Table 8.	After installation complete and testing has taken place	Contractor	PMU and RRF working closely with the Police
v. Implementation Infrastructure					
M) Confirm that the EMP is in use	Contractor must list, in tabular form, all mitigative actions completed, their timing and location, and then indicate their status as % completed and the need for any future action(s).	Mitigation measures completion list	At end of construction Period	Contractor	RRF
3. OPERATIONAL PERIOD					
i. Air Quality and Noise					
A) Monitor Noise disturbance due to increases in traffic	Confirm that at the minimum 8 village areas,, noise measurements are being taken as defined in the EMiT 3(i)-A and that noise attenuation measures are completed if noise levels exceed UZB standards Confirm that any such action is based on consultation with Hokimiyat.	Written record of actions	During year 1 of operating period	Uzavtoyul	RRF and Uzavtoyul
B) Monitor local air quality due to increases in traffic along alignment	RRF will instruct its PMU or consultant to, as a minimum, undertake spot-safety inspections of vehicles, looking for exhaust smoke and faulty equipment, particularly with old trucks and buses. If portable exhaust emission analyzers are available they should be used and any non compliant vehicles required to repair within 10 days or face large fines. This inspection should go on indefinitely	Inspection reports on violations found and of actions taken	Continuously as a part of regular inspection activity	Traffic Police in cooperation with Uzavtoyul-Maint. Dept.	Uzavtoyul
ii. Erosion and Soil Loss					
C) Confirm that erosion control measures were implemented and that the 18 sites are being properly maintained.	Special project Under RRF and Design Institute direction. UZB national budget—not ADB, but relevant since the operation of the road could be seriously affected by a mudflow or major slope slippage.	Annual erosion site rehabilitation inspection checklist report	Every year after the erosion control measure is installed for the first 6 post-construction years	Uzavtoyul Regional Maintenance Dept.—or possible village work committees	RRF and Uzavtoyul-Central

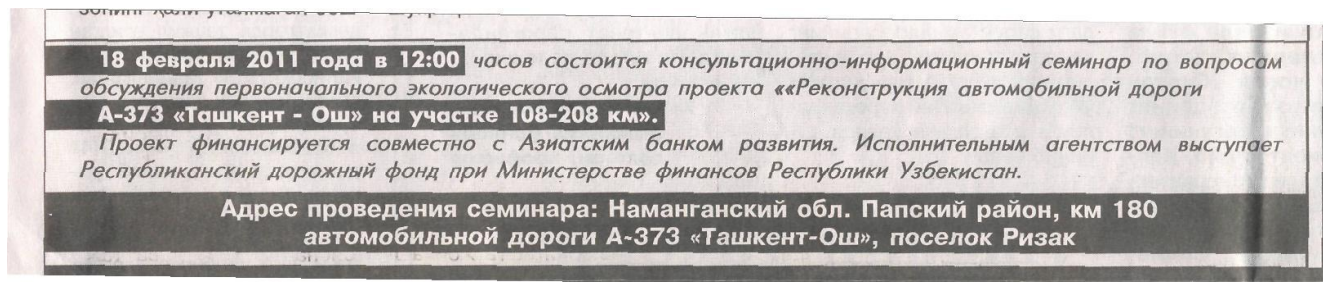
Table A-2: The Environmental Monitoring Actions table (EMoT)

ITEM	Monitoring Details	Required Reporting	Timing	Executing Unit	Report-ing Responsibility
iii. Water Quality And Haz. Materials					
D) Conduct regular inspection to ensure that stormwater detention systems are operating properly	RRF will instruct Uzavtoyul Regional Maintenance Dept (or via a local community contract) to undertake an annual inspection of stormwater detention ponds during the snowmelt and rain season to ensure proper operation. Each year an inspection confirming proper infiltration will be made, including at last two digital photos of each site. Inspection will continue to be a regular inspection task.	Along the project road at all detention pond sites	Every month as part of the routine Maintenance Dept. Tasks	Uzavtoyul Regional Maint. Department	Uzavtoyul
iv. Pedestrian and Livestock Crossings					
E) Maintain the Pedestrian and Livestock crossing works to ensure that they are functioning as designed	Uzavtoyul will conduct monthly maintenance checks on the crossing facilities to be certain that lights and power sully systems are functioning properly and tht signage is in place and not damaged. Any repairs will be made immediately	All crossing structures	Every month as part of the routine Maintenance Dept. Tasks	Uzavtoyul Regional Maint. Department	Uzavtoyul
v. Implementation Protocol					
F) Complete an audit to ensure that mitigation completion report, including an Operating stage mitigation maintenance timetable is provided Uzavtoyul's Regional Maintenance Dept.	At the end of construction the contractor (or a consultant) must confirm in writing that mitigative actions as defined in the EMP have been credibly implemented, The monitor must also check that the contractor has submitted to RRF, any other legally binding environment document, as a record of completion.	Completion report	Once the resurfaced road is fully open to traffic	Contractor and Uzavtoyul	Uzavtoyul

1. At the end of the construction period and before the final payment is approved, inspect high use areas, such as waste facilities, machinery service areas, waste disposal sites, quarries, fabrication yards, confirm environmentally acceptable decommissioning.

ANNEX B: NEWSPAPER ANNOUNCEMENT OF CONSULTATION

Newspaper Announcements Published in Republican newspaper “Ozbekiston Ovozi” (Voice of Uzbekistan): Feb. 15, 2011



English Translation of Newspaper Announcement

The text of advertisement put in newspaper that is circulated all over the country; the “Ozbekiston Ovozi” (Voice of Uzbekistan) – published on 15 February, 2011 as follows:

On 18 February 2011 at 12:00 the Public Consultation workshop on discussion of Initial Environmental Examination under the Project “Reconstruction of Road A-373 Tashkent-Osh on the section 108-208km” will take place.

The project is financed in cooperation with Asian Development Bank. Executing Agency for the Project is Republican Road Fund under the Ministry of Finance of the Republic of Uzbekistan.

The workshop [consultation] will be held in Namangan Region, Pap District, km 180 of the Road A-373 “Tashkent-Osh”, at Rezak Village.

ANNEX C: CONSULTATION BROCHURE DISTRIBUTED

GENERAL

The Government of Uzbekistan recognizes the importance of Highway A-373 with the total length of 100 km from 108 to 208, to be improved by 2014. According to the Resolution of President of the Republic dated from April 22, 2009 № PP-1103 «On reconstruction and development of Uzbek national highway between 2009-2014» international roads of I category have to be upgraded to comply with international standards and norms through construction and reconstruction of four lane roads. Related tasks are the growth of volumes and efficiency of road transportations, employment generation, Improving of potential in the area of administration and technical maintaining of road agencies at national and oblast levels.

The CAREC 2 project is the second in a series of projects to fully upgrade the country's national highways. As such, this project consists of one work packages for the upgrading of Highway A-373 between Tashkent Region and Namangan Region. For this project the road surface will be replaced with concrete and all road shoulders will be paved. The project is financed in collaboration with Asian Development Bank. The Executing Agency (EA) for the Project is the Republic Road Fund (RRF) under the Ministry of Finance.

As a part of the project implementation requirements, effects stemming from the construction works as well as measures to prevent and/or mitigate these effects are being identified. Erosion control has been identified as the most important environmental issue to be addressed.

The attendees are invited to provide their proposals and comments on this project.



Initial Environmental Examination (IEE): A-373 Road Improvement Program: Km. 108-208

PUBLIC CONSULTATION AND INFORMATION SESSION

The Executing Agency is the Republican Road Fund under Finance Ministry of the Republic of Uzbekistan in collaboration with Asian Development Bank and consultants of ISLOHOTKONSALTSERVIS



Km 108 of A 373, February 2011

INITIAL ENVIRONMENTAL EXAMINATION: WORKS AND POTENTIAL ENVIRONMENT ISSUES

The length of the road section is 100 km. Road works will include removal of the existing asphalt pavement using large grinding machines and replacing the asphalt with concrete. The concrete will be poured over a 16cm-thick layer of dry concrete. The poured concrete will be approximately 24cm thick. Four major bridges will be repaired and the decks widened, and all culverts will be replaced. This means the road work will be completely confined to the existing road t RoV of around 60m. The construction works will deal with organisation of proper management of contractors' work, careful control of construction-related dust, noise and truck traffic, as well as use of borrow sites to produce construction materials. All efforts will be made to minimum disturbance to the sensitive steppe and alpine environment. Complete post-construction rehabilitation of worksites will be undertaken. Details will be presented in the final IEE document, which will be made available to all participants at the Regional Uzavtoyul offices in Angren and Rezaksai Village.

TIMETABLE

The consultation will be held on February, 18th in February in Rezaksai Village, Namangan Region, starting at 12:30 pm.

The Consultations will consist of presentation and discussion, including tea and snacks. Copies of the presentation will be available to all attendees.

The timetable for the environmental assessment is as follows:

1. Duration of the IEE study: January 15- March 10th, 2011
2. Field collections and information collection for IEE: February 2011
3. Consultation and Information Sessions: Feb 18th, 2011.
4. Completion of IEE Draft for Review by Government and ADB: February 28th, 2011.
5. Translation of IEE Executive Summary to Uzbek and Russian: March 1st - 6th.
6. Review of IEE by participants at Oblast offices plus provision of comments: March 7th-15th
7. Construction completed end of 2014

IKS
Address: 100060, Uzbekistan, Tashkent,
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PROPOSED MITIGATION AND MONITORING

The IEE will include an Environmental mitigation and monitoring plan that will define what actions need to be taken during construction and operation of these two road sections, to ensure that no significant negative environmental impacts occur. The Plan referred to as an Environmental Management Plan or EMP will be available for participants to review and for local officials to use to monitor the implementation of mitigation measures.

The EMP will require Regional and District inspectors to report on environmental mitigation and how well it is being undertaken.

Report must be prepared and submitted to the ADB every 6 months. These reports are available to the public.

The complete IEE will be published on the ADB's website at www.adb.org and will be available at the following offices:

- Republican Road Fund under Finance Ministry of the Republic of Uzbekistan, Tashkent
- UZAVTOYUL offices in Angren and Rezaksai Village Office
- ISLOHOTKONSALTSERVIS (IKS) Company

**ANNEX D: CONSULTATION MEETING MINUTES AND ATTENDANCE LIST:
Minutes of Environmental Public Consultation and Information Session on
ADB Technical Assistance Project 7375-UZB**

1/ Meeting location: Rezak Village, Pap District, Namangan Region

2/ Meeting date: 18 February 2011

3/ Project: ADB Technical Assistance 7375-UZB

4/ List of Special Government Participants: Managers and personnel of Kamchik state enterprise for road maintenance “Kamchikavtoyul”, Chairman of Kushminar mahalla committee, representatives of local communities, local residents of Rezak village and other public representatives. Total number of people attended – 40 people

5/ Presentation given by: National Environmental expert, consultant K. Kamalov and International Consultant G. Teleki

6/ Environmental consultant presentation content: Conduction of public consultation and information session with participation of the representatives from the Republican Road Fund, specialist from the Asian Development Bank and Islohat konsaltservis company regarding Initial Environmental Examination under the Project of Reconstruction Road A373 “Tashkent-Osh” km 108-208.

7/ Comments of participants: After presentation for the purpose of discussion of this issue the public representatives raised questions of their interest. Participants expressed their opinion regarding reconstruction of road A-373 “Tashkent-Osh” km 108-208. In general they supported implementation of the project and alongside with that they expressed their opinion regarding additional works that could enhance the output of the project.

In connection with that the following local public representative asked their questions. Deputy Director of “Kamchikavtoyul”, Mr. M. Sheraliev, specialist of “Uzbektelecom”, Mr. A. Tillahujayev, pensioners I. Bekbaev, I. Imamnazarov, I. Imamberdiev, I. Musabiddinov.

8/ Follow Up Actions Defined:

Asked question, including existing or eventual environmental impacts	Solution of the issue as it was discussed during the session, including how, when and by whom	Responsible party
Will the project envisage underground pedestrian crossings	The project envisages 1 underground pedestrian crossing at km 178 of the road A-373, Rezak village	RRF and Project organization
Will the nursery transplant be planted along the road	The project envisages planting the nursery transplant for the purpose revegetation	RRF and Project organization
What measures are envisaged to lower the level of underground waters at some sections	For the purpose of lowering the level of underground waters it is envisaged to construct drainage layer made of crushed stone sand mixture	RRF and Project organization
Will it be envisaged to construct water pipeline to provide local residents with drinking water	Envisaged by a separate project	RRF and Project organization

Asked question, including existing or eventual environmental impacts	Solution of the issue as it was discussed during the session, including how, when and by whom	Responsible party
What measures are envisaged under the project to remove the black frost from the road without use of technical salt	Removal of black frost from the road without use of technical salt is impossible. It is possible to decrease the content of technical salt percentage-wise.	RRF and Project organization
Will it be envisaged to install mobile diagnostic laboratories to check the vehicle exhaust gas at the entrance at 108 km and at the exit at 208 km of the road	Upon commissioning of the road it is envisaged to install diagnostic laboratories at the check point at Chinar km 116 and check point Rezak km 190	RRF and Project organization
Will there be any antennas installed in Rezak village to cover the population of Rezak with cellular communication	Envisaged by a separate project included into the State Program	RRF and Project organization
Will it be envisaged to construct water pipelines to provide population with drinking water and will it be envisaged to construct cattle crossings and pedestrian crossings under the road	Envisaged by a separate project included into the State Program	RRF and Project organization

9/ Complete List of Attendees (including Name, home village/town and Occupation):

The complete list of attendees is attached to this document. Total number of attendees is 40 people.

List of attendees of the workshop conducted on 18 February in Rezak village of Pap district regarding the Initial Environmental Examination under the Project of Reconstruction of Road A-373 Tashkent-Osh km 108-208

No	Name	Place of employment and position	Place of residence	Signature
1	Juraev Nosir	Director of "Kamchikavtoyo'l"	Namangan city	All on file with RRF
2	Sheraliyev Muhammadjon	Deputy Director of "Kamchikavtoyo'l"	Rezak village, Pap district	All on file with RRF
3	Turaev Komiljon	Chairman of village mahalla community Kushminar	Rezak village, Pap district	All on file with RRF
4	Tillaho'jaev Aloviddin	Uztelecom	Rezak village, Pap district	All on file with RRF
5	Raimov Qodirali	Driver of "Kamchikavtoyo'l"	Rezak village, Pap district	All on file with RRF

№	Name	Place of employment and position	Place of residence	Signature
6	Imomnazarov Ibrohim	Driver of "Kamchikavtoyo'l"	Rezak village, Pap district	All on file with RRF
7	Mamatov Qidirali	unemployed	Rezak village, Pap district	All on file with RRF
8	Imomnazarov Ibrohim	unemployed	Rezak village, Pap district	All on file with RRF
9	Mavlonov Qodir	unemployed	Rezak village, Pap district	All on file with RRF
10	Mahammatov Qo'chgorali	District militia officer of Kushminar community	Rezak village, Pap district	All on file with RRF
11	Usvaliyeva Tursunoy	Counselor of Kushminar community	Kushminar village, Pap district	All on file with RRF
12	Qo'ldashev Mo'minjon	Worker of "Kamchikavtoyo'l"	Chodok village	All on file with RRF
13	Ortiqova Ra'no	Teacher, school No60	Kushminar village, Pap district	All on file with RRF
14	Bo'tayev Abdug'ani	Pensioner	Rezak village, Pap district	All on file with RRF
15	Bekboyev Yo'ldoshali	Pensioner	Rezak village, Pap district	All on file with RRF
16	Sattorov Muso	unemployed	Rezak village, Pap district	All on file with RRF
17	Vallaminov Umarali	unemployed	Rezak village, Pap district	All on file with RRF
18	Imomberdiyev Saydullo	unemployed	Rezak village, Pap district	All on file with RRF
19	O'rozov Muhammad	unemployed	Rezak village, Pap district	All on file with RRF
20	Musibidinov Insofali	Pensioner	Rezak village, Pap district	All on file with RRF
21	Abduxoliqov Sobirjon	Head of Road construction enterprise No 550 of "Kamchikavtoyo'l"	Rezak Oktepa vilage	All on file with RRF
22	Musibidinov Esomidin	Secretary of "Kamchikavtoyo'l"	Rezak Oktepa village	All on file with RRF
23	Qo'shmatov Rahimjon	Pensioner	Rezak village, Pap district	All on file with RRF
24	Vallaminov Baxtiyor	unemployed	Rezak village, Pap district	All on file with RRF
25	O'roqov Extiyor	Worker of "Kamchikavtoyo'l"	Rezak village, Pap district	All on file with RRF
26	Imomberdiyev Islom	Deputy director of school No 44	Rezak village, Pap district	All on file with RRF
27	Do'ltaboyev Dilshodbek	Businessman	Rezak village, Pap district	All on file with RRF

№	Name	Place of employment and position	Place of residence	Signature
28	Rustamov Jahongir	unemployed	Rezak village, Pap district	All on file with RRF
29	Umarov Tohir	unemployed	Rezak village, Pap district	All on file with RRF
30	Tillaho'jayev Shuhrat	unemployed	Rezak village, Pap district	All on file with RRF
31	Tillaho'jayev Erkin	unemployed	Rezak village, Pap district	All on file with RRF
32	O'rozov Sobirjon	unemployed	Rezak village, Pap district	All on file with RRF
33	O'narov Solijon	unemployed	Rezak village, Pap district	All on file with RRF
34	Raimov Nurali	unemployed	Rezak village, Pap district	All on file with RRF
35	Masaidov Zafar	Shop manager	Rezak village, Pap district	All on file with RRF
36	Vallaminov Alimardon	unemployed	Rezak village, Pap district	All on file with RRF
37	Jo'rayev N	unemployed	Rezak village, Pap district	All on file with RRF
38	Tillaho'jaev M	Shop manager	Rezak village, Pap district	All on file with RRF
39	O'narov Tohirjon	unemployed	Rezak village, Pap district	All on file with RRF
40	Asraeva Feruza	Teacher, School No44	Rezak village, Pap district	All on file with RRF

Certified Attendance List with signatures is Available with RRF, Tashkent.

Annex E: CONSULTATION PRESENTATION DELIVERED IN REZAKSAI VILLAGE (Russian Text, Delivery in Uzb. Language)

**Technical Assistance Project of ADB
№ 7375-UZB**

**Public Consultation and
Information Session**

18.02.2011 : 12.30-14:30

1

Purpose of the session

- Public consultancy on the need to reconstruct the road A 373 km 108-208. Project is to be completed in one section via several contracts.
- A second purpose is to present likely environmental impacts and seek input from interested agencies and citizens.

2

Content of the session

- Present project details and possible environmental issues and solutions
- Discussion of environmental issues likely to occur along the project road
- Listening to opinion of public representatives, community organizations and local residents
- Discussion
- Conclusion

3

Project Overview



4

**Technical Assistance Project of ADB
№ 7375-UZB**

Financed by
Asian Development Bank
Republican Road Fund under the Ministry of
Finance of the Republic of Uzbekistan

Executing Agency: Republican Road Fund under
the Ministry of Finance of the Republic of
Uzbekistan

5

**Technical Assistance Project of ADB
№ 7375-UZB**

Consultants:
IKS, Tashkent
on behalf of the Republican Road Fund under
the Ministry of Finance of the Republic of
Uzbekistan

Address: 100060, Uzbekistan, Tashkent, Sadiq Azimov str., 79
Tel: (71) 222 43 47/48, 49
Fax: (71) 233-00-22
e-mail: info@iks-company.com

6

Purpose of the project

- Implementation of the President Resolution dated from April 22 2010, No PP-1103 "On reconstruction and development of Uzbek national highway between 2009-2014".
- Complying international roads of I category with international standards and norms. All sections of the road will be upgraded from 1 lane of asphalt to 4 lane ~~asphalt~~ cement-and-concrete road.
- Improving of potential in the area of administration and technical maintaining of road agencies at national and ~~oblast~~ Regional levels.
- ~~Improving the capacity, travel time and efficiency of road transportations.~~
- Generation of new employment.

7

Map of the project area

MAP SHOWING project area

8

Schedule for IEE Implementation In Relation to Engineering Works

Task	Date
• Completion of IEE for ADB	• March 2011
• Approval by GoU and ADB	• May 2011
• Implementation of IEE	• July 2011
• Environmental Management Plan (EMP) Implementation	• July 2011
• Preparation of Bid documentation, including addition of any environmental clauses.	• Sept.-Oct. 2011
• Construction Starts	• Late 2011

9

Schedule for EIA Implementation

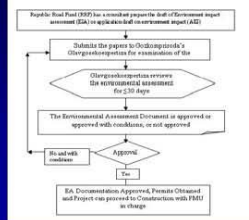
Task	Date
• Contractor defines how mitigation and monitoring from EIA implemented	• Throughout the construction Period
• Compliance Monitoring by Executing Agency and Project Implementation Unit (PIU)	• Throughout the construction Period
• Monitoring Reports to Road Fund and ADB	• Every 6 months of construction and continue into operating period

10

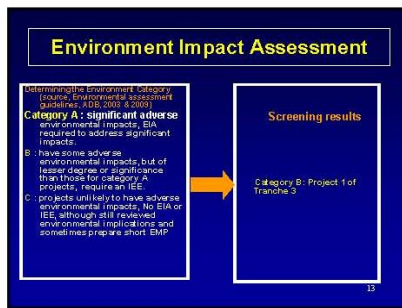
PRINCIPLES AND METHODS for EIA

11

Arrangements of environment protection



ОВОС –
оценка
воздействия на
окружающую
среду



Initial Environment examination (IEE) Methodology

- During IEE km 108 through 208 have been studied. Possible problem areas from ecological point of view have been identified.
- Identified mitigation and monitoring actions to prevent or reduce impact on the area's environment due to the construction and operation of the new road project sections.
- Plan and conduct public consultancy and defined a regular compliance monitoring reporting program.

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Km 108-116

- section passing lower Alkhangan dam location within the borders of mining allotment of coal strip mine, alt. 950m-1100m.

Km 116-126

- section passing along the bank of Alkhangan water reservoir in the middle part of slope of branches of range of Chatkai mountains: alt. 1100 m- 1140 m

Km 126-142

- passing along second terrace of the Alkhangan River and crossing the bottom of the river at 142 km, alt. 1140m -1250 m.

Km 142-156

- section passing in the middle part of slopes of Kamchiksai river valley: 1250 m-1800 m)

Km 156-168

- near mountain passage and passage parts of the road in the upper valley of rivers Kamchiksai and Kizilsai :1800 m-2200 m-The mountain pass

Km 168-175

- Decending along the right slope of the valley of Kizilsai river , near the valley floor: 2200 m - 1800m

Km 175-185

- From right and left Rezaksai valley slopes: 1800 m- 1170 m.

Km 185-208

- section of the road passing at a safe distance from the river, along the hilly surface of sub mountain valley: 1170 m -800m.



A373: Km 108 208

Key environmental characteristics:

- this road passes from foothills through alpine and then back to foothills terrain, through dry to higher precipitation conditions;
- The existing terrain has been heavily grazed over and/or converted to agriculture;
- Soils are for the most highly erodible and there are many km of severe erosion along the road;
- The road crosses three important area rivers with migratory fish populations.

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Environment impacts

1. Noise during construction;
2. Dust during construction;
3. Truck traffic transporting removed asphalt;
4. Damage to flowing rivers during bridge replacement work

21

Environment Impact

5. Poor Design of Culvert and inappropriate placement leading to chronic erosion problems
6. Erosion, rock falls, mudflows and avalanche hazards

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Proposed Mitigation

1. Air Quality Degradation: Construction and Operation Periods

- Control over speed regime and emissions into air.
- Saving of time and fuel as well as contraction of CO₂ emission will be obvious after completion of the project .

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Proposed Mitigation

2. Noise and Vibration: Construction and Operating Periods

- Control Noise and Vibration by requiring contractors to stick to a strict equipment maintenance schedule,
- Restrict working hours in residential areas,
- Operate equipment within specifications
- Travel according to assigned speed limits and restrict use of vehicle horns.

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Proposed Mitigation

3. Truck traffic transporting removed asphalt

- Control of operating hours and transportation routes to avoid settlements and the disruption of local residents;
- Set a maximum construction truck speed of 80 kph;
- Undertake dust suppression during all construction work, including at asphalt waste disposal site.

25

Proposed Mitigation

4. Damage to rivers during bridge replacement work

- All bridge demolition or construction material will not be allowed in streams, or requiring immediate removal with minimal damage;
- Construction equipment must not cross the river;
- Construction equipment will not be permitted to be washed in River;
- Construction over water will be restricted to times when fish are not migrating.

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Proposed Mitigation

5. Poor Design of and placement Culvert leading to chronic erosion problems

- Confirm that culverts are sized for the correct storm event and that construction and placement does not lead to chronic erosion
- At completion of construction, conduct a check of all new culverts and make photographic record of each new culvert

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Proposed Mitigation

6. Erosion Control

- After the completion of pavement replacement and related improvements, an erosion control and mitigation program will be undertaken, including both engineering solution and bio-engineering methods using local vegetation and trees.
- The basis of this work will be what has already been done by the Road Maintenance Department.

28

BIG ATTENTION!

Each mitigation action should be tied with the action on project performance monitoring.

29

The Environment Management Plan

- This plan (EMP) is very important result of the environment assessment and should be easily converted into mitigation and monitoring actions.
- The EMP identifies where, how often, what and who should complete each action on environment monitoring and mitigation and who is responsible for this.
- The IEE team regularly monitors and records the adequacy of mitigative measures applied to negative impacts to either prevent an impact, or pushes it down to the level acceptable by Uzbek standards and the best international practices.

30

Actions to be taken

- ✓ Complete IEE
- ✓ Confirm that EMP details are defined in the contractor bid documents and later the contract(s).
- ✓ Monitoring during road construction, in compliance with the IEE's EMP.
- ✓ Apply mitigation and monitoring measures.
- ✓ Train people who are responsible for managing environment in the period of road construction and operation.

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THANK YOU FOR YOUR ATTENTION!

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