E4618

ENVIRONMENTAL ASSESSMENT AND MANAGEMENT PLAN

AZERBAIJAN REGIONAL ROADS DEVELOPMENT PROJECT

SHIRVAN – SALYAN ROAD (R45)

SALYAN – NEFTCHALA ROAD (R46)

ASSOCIATED LOCAL ROADS

July, 2014

AZERBAIJAN REPUBLIC
MINISTRY OF TRANSPORT
Azeryolservis ASC

ENVIRONMENTAL ASSESSMENT AND MANAGEMENT PLAN AZERBAIJAN REGIONAL ROADS DEVELOPMENT PROJECT

SHIRVAN – SALAYN ROAD (R45), SALYAN – NEFTCHALA ROAD (R46) & ASSOCIATED LOCAL ROADS

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Client	International Bank for Reconstruction and Development (IBRD)
Project	Azerbaijan Regional Roads Development Project
Title	Environmental Assessment: Shirvan – Noxudlu – Salayn Road (R45), Salyan – Neftchala Road (R46) & Associated Local Roads

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ACRONYMS

ARS	Azerroadservis
BGL	Below Ground Level
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
CO_2	Carbon Dioxide
CEMP	Construction Environmental Management Plan
dB(A)	Decibels
EA	Environmental Assessment
EIA	Environmental Impact Assessment
ELV	Emissions Limits Values
EMP	Environmental Management Plan
ERP	Emergency Response Plan
ESS	Ecological Safety Sector
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GOA	Government of Azerbaijan
g/l	Grams per liter
IEE	Initial Environmental Examination
KM	Kilometer
KM/H	Kilometers per Hour
LARP	Land Acquisition and Resettlement Plan
m	Meter
MAC	Maximum Allowable Concentrations
MENR	Ministry of Environment and Natural Resources
Mg/l	Milligrams per liter
MOH	Ministry of Health
M/s	Meters per second
M^3/s	Cubic meters per second
NES	National Environmental Specialist
NGO	Non-governmental Organization
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
OP	Operational Policy
PIU	Project Implementation Unit
PM	Particulate Matter
PPM	Parts Per Million
UN	United Nations
ROW	Right of Way
SEE	State Ecological "Expertise"
SO_2	Sulphur Dioxide
UN	United Nations

UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organization
USD	United States Dollar
TMP	Traffic Management Plan
WB	World Bank
WMP	Waste Management Plan

EXECUTIVE SUMMARY

1. INTRODUCTION

This Environmental Impact Assessment (EIA) is part of the process of compliance with the World Bank Safeguard Policies in relation to the Azerbaijan Regional Roads Development Project.

The purpose of the EIA is to provide a road map of the environmental measures needed to prevent and/or mitigate negative environmental effects associated with the design, construction and operation of the project. The EIA provides a detailed description of the direct and indirect environmental effects associated with the proposed subproject during key periods of work. More specifically, the EIA:

- Describes the extent, duration and severity of the impacts;
- Analyzes all potential impacts, both positive and negative;
- Formulates the mitigation actions and presents it all in the form of an Environmental Management Plan (EMP).

Based on the existing World Bank Operational Policy for Environmental Assessment (OP4.01), this Project falls under the World Banks project **Category B**.

2. DESCRIPTION OF THE PROJECT

The Project comprises the rehabilitation of the following two "Republica" or Regional roads:

- The Shirvan Salyan Road (R45) - With a total length of 41 kilometers, the road connects the town of Shirvan with Salyan some 120 kilometers to the south of Baku.
- The Salyan – Neftchala Road (R46) - The road connects the with the junction of the M3 in Salyan and continues in a south / easterly direction for 42 kilometers until it reaches its destination in Neftchala.

The Project also includes a component for the minor upgrading of about 100-km connecting local roads in the Rayons of Sabiribad, Salyan and Neftchala to an all-weather surface.

The Design phase of the Project has yet to commence, as such, the exact nature of the three Project components has yet to be determined. However, for the purpose of this EIA the following assumptions are made:[1]

- The reconstruction of these roads is expected to follow the existing road alignments, with the possible exception of limited realignments to improve geometric characteristics and eliminate safety hazards. The extent of any realignment will be limited as land acquisition is to be avoided.
- Reconstruction of the Respublica roads will include pavement strengthening. Such roads typical have a carriageway width of 7.5 m (2 x 3.75 m lanes) with two 3.75 m shoulders of which 0.75 m is be paved.
- Within urban areas a carriageway width of 9.0 m with a footpath of 1.0 to 1.5 m width each side is required.
- Design speeds of 100 km/h will be adopted for flat and undulated terrain and 50 km/h for urban areas.
- Bridges and culverts will be reconstructed or rehabilitated.
- Traffic safety features such as lighting, pedestrian crossings, road signs, road marking will also be incorporated.
- R46 crosses one bridge which may require replacement. Both roads pass over numerous culverts.

Regarding the Local Road, the reconstruction of these roads is expected to follow the existing road alignment, with the possible exception of very limited realignments to improve geometric characteristics and mitigate safety hazards.

3. EXITING CONDITIONS

The Project Corridor (encompassing both the R45, R46 and potential local roads (most of which stem from either the R45 or R46)) traverses a flat landscape which has been heavily degraded by human activity for more than fifty years. There are no protected areas within the vicinity of the Project Corridor and no special status flora. Protected species have been noted within the Project Corridor and as such special mitigation measures for the identified species are proposed as part of this report.

[1] As per the ToR for the Selection of Consultants RFP for the Feasibility study, preparation of detailed design and bidding documents for the Rehabilitation of R45 Shirvan-Noxudlu-Salyan and R46 Salyan-Neftchala Regional Roads and Related Connecting Local Roads – December, 2013.

Traffic volumes are very low along the poorly maintained corridor which is lined by a mix of small residential settlements, farmland and pasture land. At some locations the road passes within 50 meters of the Kur River which flows broadly parallel to the Project Corridor for its entire length, however the Project does not cross the river at any point. Domestic waste litters the landscape, especially in the settlements where locals appear to dispose of their garbage into drainage ditches on an ad-hoc basis. No sites of archeological or historical significance were observed that maybe impacted by the Project. The main socio-economic activity in the Project corridor is agriculture which the Project is anticipated to benefit by improving access to and from farms and to markets. Given the current low level of road traffic and general lack of industrial activity within the Project Corridor, noise is not considered to be a key environmental issue in the Project area at present. Several sensitive noise receptors have been identified within the Project corridor, and as such they may potentially be impacted negatively by short term construction noise and long term noise level increases caused by increased vehicle volumes. All of these receptors were located in the urban areas of the road corridor.

4. IMPACT IDENTIFICATION

The EIA established that, primarily due to the degraded nature of the environment, there were no significant socio-environmental issues that could not be either prevented or adequately mitigated to levels acceptable to Azerbaijani and international standards. A complete Environmental Management Plan has been prepared for all three Project components, with tables listing mitigative measures and monitoring actions to be undertaken during the pre-construction, detailed design, construction and operating period of the project. The following provides a summary of the potential impacts associated with the R45 and R46 roads and also with the Local Roads rehabilitation works:

Design Phase

- Flooding – Given the location of the Project corridor within the flood plain of the Kur River and the possible impacts of climate change, flood events could impact significantly on the Project if designs are incorrect.
- Tree cutting – Cutting of trees within the Right of Way will be required. All applicable regulations should be followed regarding cutting and compensation to avoid impacts to the owners of the trees.
- Livestock – Pastureland is a main land use in the Project area. Herds of livestock are often noted crossing the road. Suitable passages need to be provided to limit the potential for accidents involving vehicles and livestock.
- Health and Safety – Increased traffic often leads to increased numbers of accidents. Accordingly, designs need to ensure the road limits the potential for accidents as far as practical.

Construction Phase

- Dust and Emissions – Movement and operation of construction vehicles and machinery will result in short term, elevated concentrations of dust and emissions.
- Water Quality – Spills and poor storage of liquid waste and hazardous liquids could have negative impacts to water quality.
- Soils – Spills and leaks of hazardous liquids can lead to contamination of soils that may have previously been productive. Poor construction management can also lead to issues such as soil compaction and soil erosion.
- Protected Species – A number of protected species have been identified within the Project corridor. Construction works could impact negatively on these species without due care and attention.
- Tree Cutting – without adequate maintenance newly planted trees may not survive.
- Borrow Pits – Opening, operating and closure of borrow pits can result in multiple impacts if poorly managed. Impacts may include air quality issues, noise and impacts to flora and fauna.
- Infrastructure – Working within villages in the Project corridor may necessitate the removal (temporarily) of utilities. This can create social tensions if potential disruptions are not discussed with locals and alternative measures are not provided.
- Cultural Heritage – No cultural heritage items were noted in the Project corridor, however chance finds could occur.
- Noise – Operation of construction vehicles and machinery can lead to elevated levels of noise within residential areas.
- Waste and Spoil – Where possible cut will be balanced with fill. However, there maybe some excess fill materials that will require disposal at a suitable location. In addition camps and worksites will generate a large volume of inert and to a lesser extent, hazardous waste
- Health and Safety – The potential exists for health and safety impacts to villagers (especially school children) living and working within the construction areas, and also to the construction workers themselves if they do not have appropriate equipment for their jobs.

Operational Phase

- Noise – without sufficient data (traffic counts, detailed designs) it has not been possible to adequately assess potential noise impacts in the operational phase of the Project. Rough estimates of noise have been made in this report, but they are based on very subjective figures. These estimates indicate that noise levels may potentially increase above the stringent legal noise limits for urban areas in Azerbaijan – which may impact upon the identified sensitive receptors. Based on these estimates noise barriers would be required for most urban sections of the Project corridor. Accordingly a better understanding of the potential noise levels (based on actual design conditions and traffic forecasts) is required

before recommendations on this issue are made. As such, it has been recommended that during the design phase noise modeling is undertaken based on traffic forecasts and a detailed design to assess the locations where noise barriers may be required.

5. MITIGATION ACTIONS

The summary mitigation measures for the potential impacts identified above for the R45 and R46 Roads include:

Design Phase

- Tree cutting – Surveys of exact numbers of trees to be cut will be undertaken and owners compensated according to the laws of Azerbaijan. Table 5-2 lists the potentially affected trees and their locations for R45 & R46.
- Flooding – The Design Consultants shall consider the potential for current and future flood events within the Project area and establish an appropriate embankment height and drainage measures to account for potentially more regular and more intense flood events that could potentially affect both the R45 and R46 due to their location within the floodplain of the Kur River. All drainage works shall be designed based on the historical flood data and flood forecasting.
- Livestock – Animal underpasses will be constructed at various locations within the Project Corridor to allow for the safe movement of livestock.
- Health and Safety – The road construction will follow all applicable standards for road safety in Azerbaijan.
- Noise – No noise barriers or noise protection methods are recommended in this EIA. Currently no detailed designs or traffic counts exist and any recommendations for noise barriers would be extremely subjective and not based on technical criteria. This does not however mean that noise barriers may not be required as part of the Project. It is therefore recommended that the following actions are undertaken during future phases of the Project:
    - Design Phase – The Design Consultant shall prepare traffic counts during this phase of the Project. He shall then undertake noise modeling based on detailed designs (which clearly show the distance and height of urban dwellings from the road side) and the results of the traffic counts. The objectives of the noise modeling are to assess which areas of the Project Corridor will be subjected to noise levels elevated above Azerbaijani noise standards during the operational phase of the Project (based on projections in 5 and ten years time). Based on the results of the noise modeling exercise the Design Consultant shall prepare designs for noise barriers where noise levels are anticipated to be exceeded within the Project

Corridor. The design specifications shall be included in the Bill of Quantities supplied to potential Contractors during the construction contract bidding stage of the Project. The noise barrier design requirements and locations shall also be included in the Contractors contract.

Pre-construction Phase

- Management Plans – To ensure that all of the potential mitigation measures are applied at the construction phase, the Contractor shall be responsible in the Pre-construction phase for the preparation of his Construction Environmental Management Plan (CEMP), which shall include a, waste management plan, traffic safety plan, emergency response plan, health and safety plan, borrow pit plan and an air quality plan. The CSC shall be responsible for reviewing and approving all of the Contractors plans.
- Resettlement – No resettlement is anticipated as part of the Project. However, a Resettlement Policy Framework has been prepared for the Project as part of the Projects Feasibility Study to ensure that any unanticipated resettlement is managed appropriately during the detailed design phase of the Project
- Permits – The Contractor shall be responsible for obtaining all of the required environmental permits prior to the start of construction. All permits will be reviewed by the CSC before construction work commences.

Construction Phase

- Dust and Emissions – Proper control, siting and maintenance of equipment shall mitigate emissions impacts. Spraying of roads with water during dry periods and covering of friable materials will also help prevent dust impacts.
- Water Quality – Proper siting and management of facilities as per the recommendations of the EIA will prevent impacts to water quality. Accidental spills could occur and provisions are recommended to manage such accidents.
- Soils – Measures are outlined within the EIA to reduce the impacts of potential spills and leaks. They include storing hazardous liquids in special storage areas within concrete bunds and the provision on spill kits in these areas.
- Protected Species – A range of measures have been provided to mitigate impacts to the protected species identified within this report (see Table 5-3 – Construction impact and mitigation measures for endangered species). They include items such as collection of Tortoises noted within working sites and release to suitable habitats and the surveying of old properties due to be demolished to ensure they are not used as habitats for bats. The

Contractor shall be responsible for implementing these measures with oversight from the Construction Supervision Consultant (CSC).

- Borrow Pits – Top-soils should be saved and standard procedures adopted for the operation of borrow pits. Upon completion of works the pit should be reinstated to the form specified in the original borrow pit plan.
- Tree cutting – The Contractor shall be responsible for maintaining newly planted trees for a period of six months after planting.
- Infrastructure – Before the removal of utilities or other infrastructure (such as irrigation channels), the Contractor shall notify the general public of the potential disruption and arrangements will be made between the Contractor and those affected to minimize the disruption.
- Noise – Noise levels from construction equipment and vehicles can be reduced by introducing activity time constraints and by ensuring proper siting and maintenance of equipment.
- Waste and Spoil – The Contractor will be responsible for the safe collection and removal of all waste materials from his site. Accordingly, he should prepare contracts with a suitably licensed waste management contractor for the removal of inert and hazardous wastes from his sites. Waste manifests shall also be kept by the Contractor as proof of the shipment of these wastes.
- Health and Safety – Health and safety plans, training and HIV/AIDS awareness programs will be provided by the Contractor. In addition he shall prepare traffic management plans to reduce potential impacts to villagers during construction periods. The Contractor shall also be responsible for providing adequate Personal Protective Equipment for all workers, including sub-contractors and site visitors.
- Cultural Heritage – The EMP provides a procedure for chance finds.

An Environmental Management Plan has been prepared for the R45, R46 and Local Roads. The EMP includes all of the mitigation and monitoring requirements specified in this report in a tabular format. The EMP will form part of Contractors contracts and shall also guide the Design Contractor and the Construction Supervision Consultant during all phases of the Project lifecycle.

6. MONITORING ACTIONS

To ensure that all of the above mitigation actions are completed according to the requirements of the EMP, monitoring shall be undertaken of Project works by the CSC. as follows:

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

Safeguards Officer will also undertake regular inspections of the Contractors camps and works in association with the CSC.

7. CONSULTATIONS

Stakeholder consultations were undertaken in Neftechala, Salyan, Shirvan and Sabirabad between the 29th and 30th May, 2014. The consultations with villagers, local officials and government representatives did not reveal any environmental impacts that could not be mitigated by this EIA and its associated EMP. Section 7 of the Report provides an outline of the consultation procedures and summary of the main comments received.

8. IMPLEMENTATION

The EMP, its mitigation and monitoring programs, contained herewith shall be included within the Project Bidding documents for project works. The Bid documents state that the Contractor shall be responsible for the implementation of the requirements of the EMP through his own Construction Environmental Management Plan (CEMP) which will adopt all of the conditions of the EMP and add site specific elements that are not currently known, such as the Contractors final list of borrow pit locations. This ensures that all potential bidders are aware of the environmental requirements of the Project and its associated environmental costs.

The EMP and all its requirements will also be added to the Contractors Contract, thereby making implementation of the EMP a legal requirement according to the Contract. He shall then prepare his CEMP which will be approved and monitored by the CSC. Should the CSC note any non-conformance with the CEMP the Contractor can be held liable for breach of the contractual obligations of the EMP. To ensure compliance with the CEMP the Contractor should employ a national environmental specialist to monitor and report Project activities throughout the Project Construction phase.

1. INTRODUCTION

1.1 PURPOSE OF THE REPORT

This Environmental Impact Assessment (EIA) is part of the process of compliance with the World Bank Safeguard Policies in relation to the Azerbaijan Regional Roads Development Project. The EIA provides a road map to the environmental measures needed to prevent and/or mitigate negative environmental effects associated with the development project. The EIA also provides a detailed description of the direct and indirect environmental effects associated with the proposed subproject during key periods of work. More specifically, the EIA:

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

1.2 IDENTIFICATION OF THE PROJECT AND PROJECT PROPONENT

The Project is to be implemented by the Azeryolservis (ARS) under the aegis of the Ministry of Transport (MoT). The Government of Azerbaijan (GoA) intends to use funding from the Second Highway Project loan/credit towards these consulting services for the preparation of the Environmental Assessment Reports and Environmental Management Plans for the rehabilitation of these regional and local roads.

1.3 THE NATURE, SIZE, LOCATION AND IMPORTANCE OF THE PROJECT

The Project includes three outputs:

1. **Shirvan - Salyan Road (R45)** - with a total length of 41 kilometers the road connects the town of Shirvan with Salyan some 120 kilometers to the south of Baku. The existing alignment, which connects with the M6 motorway (currently being rehabilitated) at Shirvan runs in a north south direction broadly following the Kur River before it concludes at the M3 junction in Salyan.
2. **Salyan – Neftchala Road (R46) -** the 42 kilometer road starts connects at the junction of the M3 in Salyan and continues in a southerly direction to Gadimkand whereupon it follows an easterly route parallel to the Kur river until it reaches its conclusion in Neftchala.
3. **Improving 100 km local access roads** - Minor upgrading of about 100-km connecting local roads in the Rayons of Sabiribad, Salyan and Neftchala to an all-weather surface.

1.4 EIA BOUNDARIES

For the two Project Roads (R45 & R46) this EIA covers the entire length of both roads and for purposes of this impact assessment, an envelope of 200 meters wide on each side of the project roads over their entire length is identified as the primary impact area ("Project Area" or "Project Corridor"). This distance takes into account the common impacts associated with road works such as noise, dust and emissions. However, the project impact area maybe widened depending on conditions on the ground and with regard to specific construction sites outside of the right of way (RoW), e.g. borrow pits and camps. The road sections where sensitive receptors are present, such as schools, hospitals or other places where people congregate are given particular attention so that ample mitigation is formulated. For road sections that cross irrigation systems and canals (the Project does not cross any river), the impact assessment is expanded to cover the identified continuous extent of any ecologically important habitats / features along the Project Corridor.

It is anticipated that most of the locals roads selected for rehabilitation will feed directly into both the R45 and R46 as it is assumed that the social and economic benefits associated with the rehabilitation of these connecting roads will be greater than roads isolated from the R45 and R46. Impacts resulting from the small scale rehabilitation activities will almost certainly not involve resettlement or land take, there will be no impacts to protected areas and almost all social and economic impacts will be beneficial. Negative impacts are likely to occur only to narrow bands of existing vegetation adjacent to the local roads and potentially to irrigation channels.

1.5 METHODOLOGY APPLIED

The methodology is based on the World Bank Operational Policies and the joint experience of the International and National environmental consultants involved in the EIA. Background data and information was obtained from published and unpublished sources, e.g., on: climate, topography, geology and soils, natural resources, flora and fauna, agriculture, and socio-economic data. Several site inspections were conducted jointly by the International Environmental Specialist and National Counterpart during April, 2014. The existing roads were driven and areas of potential environmental significance assessed carefully. Formal discussions were held with a number of stakeholders (see **Section 7**) in order to determine their perceptions of the level of impact from road works. Data and information obtained have been included where appropriate in the EIA Report, and also as Annexes to this report.

1.6 CONSTRAINTS AND LIMITATIONS

As stated above, the main limitation to the report is the lack of design, this has meant that the locations of local roads are not known and also that the exact scope of works is not known, e.g. how much embankment material will be required, locations and numbers of culverts, etc. This has also meant that a number of assumptions have been made about the specification of the road and the potential impacts that may result from construction of such a road. The assumptions are based upon the experience of the Consultants on other similar road projects, in particular the M6 which was constructed to a similar specification in a similar portion of the country.

1.7 STRUCTURE OF THE REPORT

The report is organized as follows:

- **Section 1: Introduction –** The section in hand provides the introductory information.
- **Section 2: Legal, Policy and Administrative Framework -** This section presents an overview of the policy/legislative framework as well as the environmental assessment guidelines of Azerbaijan that apply to the proposed project. The section also identifies relevant World Bank Operational Policies that will apply.
- **Section 3: Description of the Project –** Section 3 describes the Category of the Project, the Project need and its environmental setting. A limited scope of works is also provided indicating the type of engineering works required.
- **Section 4: Description of the Environment –** This section of the report discusses the regional and local environmental baseline conditions. This section is divided into subsections relating to physical environment, biological environment and socio-economic conditions.
- **Section 5: Environmental Impacts and Mitigation Measures –** Section 5 outlines the potential environmental impacts and proposes mitigation measures to manage the impacts.
- **Section 6: Environmental Management Plan –** This section provides the EMP for the design, construction and operational phases of the Project.
- **Section 7: Public Consultations –** Section 7 provides a summary of all of the stakeholder consultation activities undertaken.
- **Section 8: Conclusions and Recommendations –** The final section of the report provides the report conclusions and recommendations.

2. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1 GENERAL

According to the EIA Terms of Reference, this section of the report shall "Discuss the policy, legal and administrative framework and their requirements (e.g. Azerbaijan legislation, World Bank, relevant international environmental agreements, comparison of the requirements of the Azerbaijan legislation and the World Bank policies, analyzing discrepancies and gaps, and the ways of addressing those gaps)". Accordingly, this chapter presents descriptions of:

- Institutional Framework for Environmental Management in Azerbaijan;
- National Environmental Policies;
- Other Regulations relating to Environment and Road Construction;
- International Environmental Agreements;
- Construction Permits; and
- World Bank Policies.

2.2 INSTITUTIONAL FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT

The key environmental institution in Azerbaijan is the Ministry of Ecology and Natural Resources (MENR). MENR was established by Presidential Decree in 2001 from the former State Committee for Ecology and Natural Resources Utilization. At that time, MENR took over the functions of several other state bodies such as the departments of Hydrometerology, Geology, Forestry and Fishery. MENR" s activities are sub-divided into the following main areas:

- Environmental policy development
- Environmental protection
- Water monitoring and management
- Protection of marine (Caspian Sea) bio-resources
- Forest management
- Bioresources and protected areas management

MENR" s State Ecological Expertise (SEE) department (under the Department of Environmental Policy and Environmental Protection) is responsible for the review and approval of environmental impact assessments (EIAs) submitted by developers.

There are over 60 ecological Non-Government Organisations (NGOs) in Azerbaijan. Two NGOs – Azerbaijan Centre for Biological Diversity and Azerbaijan Ornithological Society – were involved in the preparation of this EIA study.

2.3 NATIONAL ENVIRONMENTAL POLICIES

The constitution of the Republic of Azerbaijan defines principles for environmental protection and ownership of natural resources along with regulations for their use. The legislative framework relating to the environment consists of:

- Parliamentary legislation that establishes the State regulation of strictly protected natural areas, and the protection and use of the environment and biodiversity.
- Presidential Decrees and orders and the resolutions of the Cabinet of Ministers that ensure the implementation of the major provisions of the laws.
- By-laws of the executive authorities (Ministries and Committees) that specify the activities to implement the laws.
- International Agreements and Conventions to which Azerbaijan is a signatory.

The Law on Environmental Protection (EP) of 1999 governs environmental protection in Azerbaijan. Legislation on land use and development consists of the Land Code and other legislative acts. Laws on the protection and sustainable use of natural resources include: Law on Plant Protection (1996), Forestry Code (1997), Water Code (1997), Law on Fisheries (1998), Law on Fauna (1999) and Law on Specially Protected Natural Areas and Object (2000).

Laws regulating environmental pollutants include those relating to environmental protection (1999), atmospheric pollution (2001), pesticides and agrochemicals (1997), industrial and domestic waste (1998) and water supply and wastewater (1999).

There are several different categories of officially protected areas in Azerbaijan including:

- National Parks, e.g. Shirvan National Park and Hirkan Forest National Park: areas with ecological, historical and aesthetic values, designated for nature protection, environmental awareness, scientific, cultural and other

purposes. All land and natural resources belong to the Park management authority, and some economic activities (including ecological tourism) are allowed.

- Strict Nature Reserves, e.g. Gyzyl-Agach Bay State Nature Reserve and designated Ramsar Wetland of International Importance: state-owned, strictly protected areas designated for nature protection and scientific research. No economic activity is allowed. All have management plans and both enforcement and scientific staff.

There are special buffer zones around these areas, and other natural areas such as rivers and water sources. The level of protection given to different protected areas depends on their significance – international, national, regional or local.

2.4 OTHER REGULATIONS RELATING TO ENVIRONMENT AND ROAD CONSTRUCTION

- The law of the Azerbaijan Republic on Ecological Safety (No 677-IQ): this law includes establishment of the legal framework for the purpose of protection of lives and health of individuals, the public, material and moral values thereof, the environment, including atmospheric air, cosmic space, water objects, subsurface, soils, natural landscapes, flora and fauna from hazards which may arise as a result of impact of natural and anthropogenic factors.
- Azeri Law on Automobile Roads (March 10, 2000) Section 39: Protection of the Environment: States that any construction or reconstruction of roads requires the official approval of the Ecological Committee. State of the art technology must be applied and that chemicals used must be environmentally sound. The unit of the Ministry responsible for road environment must approve the proposed environmental, health and safety norms of the construction.
- Law of the Azerbaijan Republic on provision with environmental information(March 2002; No 270 – IQ): This Law regulates relations connected with provision by State and local self-government bodies and authorities of in-time and exact information on environmental condition and application of natural resources. This Law interprets environmental information about:
    - condition of soil, water, Earth surface, atmosphere and living organisms,

- changes, as a result of human activity, which may occur or occurred in environmental components, which effect or may effect on human health,
- assessment of these changes,
- environmental protection,
- measures on efficient application and expenses.

According to the Law, by procedure of provision with environmental information, it is divided into restricted type and open type information and excluding restricted information, every person, independent on time and unconditionally enjoys the right of getting information.

- Law of the Azerbaijan Republic on safety of hydrotechnical installations (December 2002, N. 412 – IQ): The Law regulates relations connected with guaranteeing of safety of hydro-technical installations during design, construction, operation, reconstruction, recovery, preserving and liquidation of them and determines relevant duties of state power organs, owners and operators of these installations.

- SNIP 2.05.02-85 Building Code & Regulations for Automobile Roads Ch. 3: Environmental Protection: Indicates the general need to minimize adverse environmental impacts in road design and provides for instructions on the removal and re-use of top soil (no. 3.4); the need to provide buffer between the road and populated areas and to carry out noise reduction measures to assure compliance with the relevant sanitary norms (no. 3.9); on the dumping of excess materials (no. 3.12).

- Civil Code (December 1998): this dooocument states that any rights to immovable properties must be registered with the State, and that land may be recalled from owners for state or municipal needs as approved by the relevant courts

- Law of the Azerbaijan Republic on subsurface (subsoil) (February 1998; No 439-IQ): this law shall regulate relations in connection with the development (exploration, research), efficient use, protection and safety of works in the subsurface on the territory of the Azerbaijan Republic, including subsurface in the Azerbaijan Republic section of the Caspian Sea (Lake), provide for the protection of interests of the state, users of the subsurface and individuals in course of use of the subsurface

- Rules of Issue of the Status of "Mountainous-Mining Allocation" To Subsurface Section For Extraction of Mineral Resources, Construction and Operation of Underground Facilities Not Associated with Extraction of Mineral Resources (No. 1 of January 9, 1999): these Rules shall establish procedures for the issue of the status of "Mountainous-Mining Allocation" to a subsurface section upon special permission (license) for extraction of mineral resources and construction and operation of underground facilities not associated with extraction of mineral resources on the territory of the Azerbaijan Republic.

- Law of the Azerbaijan Republic on municipality water industry (June 2001; No 159-IQ: purpose of this law is to determine legal bases of relationship between municipalities and corresponding bodies of executive power, legal and physical persons, connected with usage and protection of water industrial objects, located at the territory of municipalities of Azerbaijan Republic.
- Rules for Use, Protection and Preservation of Trees and Bushes which are not included to the Forestry Fund of Azerbaijan Republic (No 173; 19 of September, 2005): this document includes detailed description of trees and shrubs that are not include to the forestry Fund and the way of their protection as well as the exclusions and the regulation in case of necessity of their cutting or replanting.
- The Law of the Republic of Azerbaijan on Sanitary and Epidemiological Safety, 1993 Section III: Responsibilities of State Bodies, Agencies, Companies on the Provision of Sanitary and Epidemiological Safety: General framework provisions on the requirement to provide healthy and safe conditions at workplaces and work camps (and many others) in compliance with the relevant sanitary hygiene, construction regulations and norms (particularly items 14, 15, and 16).
- Law on the Protection of Historical and Cultural Monuments of Azerbaijan Republic (april 1998; No 470-IQ): This Law is regulating the issues connected to protection, investigation and using of historical and cultural monuments - Article 13. Protection of the monuments during construction and other service works; Article 14. Archaeological investigations on the sites of new constructions
- Presidential decree on "Creation of Nature Reserve for group of mud-volcanoes of Baku and Absheron peninsula" (15 August 2007): This decree is addition to the Law on Protected Areas (2000) and includes establishment of the legal framework for the purpose of protection of unique landscape forming by mud- volcanoes occurring on the area.
- Safety Regulations for Construction, Rehabilitation and Maintenance of Roads, 1978: Comprehensive compilation of safety rules to technical safety requirements of road construction equipment, operation and maintenance of asphalt plants, work in borrow sites, loading and unloading operations, work with toxic substances, etc.
- SNIP III-4-80 Norms of Construction Safety: Detailed regulations on construction worker‟ s health and safety. Chapters 2 and 5 provide organizational procedures of construction and work sites and material transport. Annex 9 contains standards on maximum concentrations of toxic substances in the air of working zones; Annex 11 states that workers

need to be informed and trained about sanitation and health care issues and the specific hazards of their work.

- SNIP II-12-77: Chapter II. Norm of designing for noise protection: Identification of different noise sources, full list of maximal noise level for different areas (residential, hospitals, industrial etc.) in different daytime, technical description of different measures for noise level reduction etc are present in the document.
- Guidelines for Road Construction, Management and Design, February 7, 2000: Part I: Planning of Automobile Roads: Addresses environmental issues in road design, construction and maintenance. Part II: Construction of Automobile Roads: Requires that the impacts on the ecological, geological, hydro-geological and other ecological conditions are minimized by implementing adequate protective measures. Part III: Protection of the Environment: Requires the consideration of appropriate protection measures, which shall contribute to the maintenance of stable ecological and geological conditions as well as the natural balance. Provides general overview on the requirements for environmental protection.
- BCH 8-89 Regulations on Environmental Protection in Construction, Rehabilitation and Maintenance of Roads: Comprehensive provisions on environmental protection measures of surface and groundwater resources; protection of flora and fauna; use, preparation and storage of road construction machinery and materials; servicing of construction machinery; provisional structures; provisional roads; fire protection; borrow pits and material transport; avoidance of dust; protection of soils from pollution, prevention of soil erosion etc. The appendices to this document also state standard for: maximum permitted concentrations of toxic substances; noise control measures; soil pollution through losses of oil and fuel from construction equipment; quality of surface water.
- Sanitary Norms CH 2.2.4/2.1.8.562-96, 1997: Ambient noise quality and maximum allowable noise level standards for residential, commercial and industrial areas, hospitals and schools (day/night standards).
- GOST 12.1.005-88: National Ambient Air Quality Standards with detailed table of maximum allowed concentrations of elements detrimental to health.
- DÜST 17187 (presidential decree No 796 from 8th of July, 2008): State General Standards and Requirements to noise and vibration levels with detailed tables of such standards depending from daytime and location
- GOST 2874-82: hygienic requirements and quality control of drinking water.
- Reg. 514-1Q-98 Regulation on Industrial and Municipal Waste: This law includes requirements for industry and enterprises on the implementation

of identified standards, norms and environmental protection for waste when designing, constructing or reconstructing.

2.5 INTERNATIONAL ENVIRONMENTAL AGREEMENTS

Azerbaijan is a signatory to most international agreements and conventions relating to the environment, as indicated in **Table 2-1**.

Based on article 151 of the Azerbaijan Constitution, international Conventions over-ride national laws if there is any conflict. The Law on Environmental Protection specifically states that environmental assessment process in Azerbaijan (State Ecological Expertise) is guided, inter alia, by international legal obligations.

Table 2-1: International Agreements and Conventions

International Convention	Year Ratified
UNESCO Convention on Protection of World Cultural and Natural Heritage	1994
UN Framework on Climate Change	1995
UN Convention for the Protection of the Ozone Layer (Vienna Convention)	1996
Agreement on Mutual Cooperation of the Commonwealth of Independent States in the area of Hydrometeorology	1998
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and Agreement on Protection of Sturgeons	1998
UN Convention to Combat Desertification	1998
UN Convention on Environmental Impact Assessment in the Trans-boundary Context (Espoo Convention)	1999
Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)	1999
UNECE Convention on Access to Information, Public Participation in Decision- Making and Access to Justice in Environmental Matters (Aarhus Convention)	1999
UNESCO Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)	2000

International Convention	Year Ratified
UNECE Convention on the Protection and Use of Trans-boundary Watercourses and International Lakes (Helsinki Convention)	2000
UN Convention on Biological Diversity	2000
FAO Convention on Plant Protection	2000
Protocol on UN Framework Convention on Climate (Kyoto Protocol)	2000
Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol)	2000
European Agreement about Transportation of Dangerous Goods on International Routes	2000
UN Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention)	2001
UNECE Convention on Long-Range Trans-boundary Air Pollution	2002

*

Azerbaijan is a party to the UN Economic Commission for Europe (UNECE) Convention on EIA in a Trans-boundary Context (or Espoo Convention), which stipulates the obligations of Parties to assess the environmental impact of certain activities at an early stage of planning. The Convention also lays down the general obligation of States to notify and consult each other on all major projects under consideration that are likely to have a significant adverse environmental impact across boundaries.

Azerbaijan is also a signatory to the UNECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (also „Aarhus Convention"), which establishes a number of rights of the public (citizens and their associations) with regard to the environment. Public authorities (at national, regional or local level) are to contribute to allowing these rights to become effective.

2.6 CONSTRUCTION PERMITS

2.6.1 Borrow Pit Requirements

Operation of a new borrow pit for extraction of aggregate requires a number of documents such as Permission from Local Executive Power with attached Act and Map from local Land Committee. Permission from Ministry of

Emergency Situations (State Agency on Industrial Safety and Mining Supervision) shall be received as well. On the base of these documents and personal site observation Regional Department of MENR will issue Conclusion that has to be presented to the State Ecological Expertise Department of MENR for final permission receiving. This document will include the list of rules for site exploitation and re-cultivation. The application requires an Ecological Passport that can be issued after site final approval. Details required include location of borrow pit and proposed volume, rate of extraction, estimated volume of dust emission etc. By the extraction completion, the Contractor shall undertake relevant reinstatement measures, such as site clearing, landscaping, top-soiling, grass seeding and/or re-plantation of bushes and trees if any had been disturbed. Approval on properly done reinstatement shall be received from regional department of MENR. Additionally if area of the borrow pit is exceeding 1 ha, archaeological conclusion from Academy of Science Institute of Archaeology and Ethnography shall be received.

2.6.2 Asphalt and Concrete Batching Permits

Operation of a new asphalt or concrete batching plant requires a permit from the Ministry of Economic Development. Permission from Local Executive Power with attached Act and Map from local Land Committee shall be received (as for installation of every structure within district). Again the application requires an permission document from State Ecological Expertise Department of MENR (prepared on the base of Local Department Conclusion). Additionally, Ecological Passport, Inventory of Exhaust Emission into the Atmosphere, Allowed Limits of the Exhausts Emision, Special Permission (Passport on filter for the plant). Once approved, the site is registered by MENRs regional branch. MENR will undertake regular checks on sources of materials, appropriate use of technology and environmental impacts such as air quality and spillages. Permission document (Conclusion on full or conditional approval) from Ministry of Emergency Situations (MES) shall also be received by the Contractor. Regional Fire Safety Department of MES will then undertake routine monitoring on fire safety and implementation of conditions of the approval.

2.6.3 Other Permits and Licenses

Other Permits required for the Project include:

Construction Camp:

- Land Acquisition Contract / Lease Agreement
- No Objection Letter from Local Executive Power
- Land use Approval
- Ecological Expertise Approval

- Ecological Passport
- Contract for Waste (including Hazardous Waste) disposal
- Contract for Sewage disposal
- Certificate from the Ministry of Emergency Situations

Diesel Fuel Storage

- Technical Certificate from the Ministry of Emergency Situations
- Ecological assessment by the Ministry of Ecology and Natural Resources on the basis of regional approval document

Water Extraction

- No Objection for the Extraction of water

2.7 AIR, NOISE AND WATER QUALITY STANDARDS

Azerbaijan has standards for permissible noise levels, air quality and drinking water quality. These standards are provided by Tables 2-2, 2-3 and 2-4.

Table 2-2: Selected Air Quality Standards

Pollutant	Maximum Allowable Concentration (mg/m^3), for a given moment	Maximum Allowable Concentration (mg/m^3), for 24 hours
Dust	0.15	0.03
Sulphur Dioxide	0.30	0.20
Carbon Monoxide	3.00	2.00
Nitrogen Dioxide	0.08	0.07
Lead and its compounds (except tetraethyl lead)	0.001	0.0002

Table 2-3: Maximum Allowable Noise Levels

Maximum Allowable Noise Levels, dB(A) 23.00 – 07.00	Maximum Allowable Noise Levels, dB(A) 07.00 – 23.00	Description of Area
45	60	Residential areas
55	65	Industrial areas

35	50	Places of public amusement and tourism
30	40	Sanitary areas and resorts
45	50	Agricultural areas
Up to 30	Up to 35	Protected areas

Table 2-4: Drinking Water Quality Standards

Parameter	Maximum Allowable Concentration (mg/l)
TVC @ 37°C	100
Total Coliforms in 1000 ml water (coli-index)	3
Aluminum	0,5
Beryllium	0,0002
Molibdenum	0,25
Arsenic	0,05
Nitrate (as nitrate)	45
Leed	0,03
Selenium	0,001
Strontium	7
Fluoride	1,5
pH	6.0-9.0
Iron	0,3
Hardness	7 epm
Manganese	0,1
Copper	1
Polyphosphate residual (PO4-)	3,5
Sulphate	500

Parameter	Maximum Allowable Concentration (mg/l)
Dry Residue (TDS)	1000
Chloride	350
Zinc	5
Taste	<2
Odour (Dilution number @25°C)	2
Colour (true colour units) Pt/Co	20°
Turbidity (Formazine turb.units)	1,5

2.8 ADMINISTRATIVE FRAMEWORK

The following government agencies will be involved in the management and monitoring of environmental aspects or concerns of the proposed road rehabilitation project:

ARS is responsible for planning, constructing, operating, and maintenance of national roads in Azerbaijan. The Project Implementation Unit (PIU) of the ARS will be in charge of project management, among others, to ensure that appropriate budget will be provided for the implementation of mitigation measures and monitoring the program, and that the contract provisions are properly implemented.

The Regional Monitoring Department of the MENR shall undertake routine and random monitoring of the project to determine compliance with environmental regulations and standards.

The Sanitary and Epidemiology Department of the Ministry of Health (MOH) will undertake routine monitoring of the living conditions and sanitary provisions at the contractor's work camp and worksites. MOH's Regional Desinfection Centre shall be involved in approving the contractor's work camp installations and facilities and their compliance with the relevant sanitary and health norms and guidelines.

During the operational phase of the Project, ARS will undertake routine monitoring of road safety, the storm water drainage system, the condition of tree plantations and revegetation, etc.

2.9 WORLD BANK POLICIES

2.9.1 General

The World Bank's environmental and social safeguard policies are regarded as a cornerstone of its support to sustainable poverty reduction. The objective of these policies is to prevent and mitigate undue harm to people and their environment in the development process. These policies provide guidelines for the World Bank and borrowers in the identification, preparation and implementation of programmes and projects.

2.9.2 Environmental Assessment

Environmental Assessment is one of the 10 environmental, social, and legal Safeguard Policies of the World Bank. Environmental Assessment is used in the World Bank to identify, avoid, and mitigate the potential negative environmental impacts associated with Bank lending operations. In World Bank operations, the purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted. The World Bank's environmental assessment policy and recommended processing are described in **Operational Policy (OP) 4.01: Environmental Assessment**. This policy is considered to be the umbrella policy for the Bank's environmental 'safeguard policies'.

Initially the Bank undertakes environmental screening of each proposed project to determine the appropriate extent and type of EA. The Bank classifies the proposed project into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts.

(a) *Category A*: A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. EA for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. For a Category A project, the borrower is responsible for preparing a report, normally an EIA.

(b) *Category B*: A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas--including wetlands, forests, grasslands, and other natural habitats--are less adverse than those of Category A projects. These impacts

are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of Category A EA. Like Category A EA, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. The findings and results of Category B EA are described in the project documentation (Project Appraisal Document and Project Information Document). The Project herewith has been classified as a Category B Project.

(c) *Category C*: A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.

(d) *Category FI*: A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

2.9.3 Other Relevant Policies

For the present Project, the other relevant safeguard policies to be considered at all stages of preparation and planning are:

- Involuntary Resettlement (World Bank OP 4.12);
- Natural Habitats (World Bank OP 4.04);
- Forestry (World Bank OP 4.36); and
- Physical Cultural Resources (World Bank OP 4.11).

The Bank's **Operational Policy 4.12: Involuntary Resettlement** is triggered in situations involving involuntary taking of land and involuntary restrictions of access to legally designated parks and protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts. It promotes participation of displaced people in resettlement planning and implementation, and its key economic objective is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement.

Operational Policy 4.04: Natural Habitats seeks to ensure that World Bank-supported infrastructure and other development projects take into account the conservation of biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society. The policy strictly limits the circumstances under which any Bank-supported project can damage natural habitats (land and water areas where most of the native plant and animal species are still present). Specifically, the policy

prohibits Bank support for projects which would lead to the significant loss or degradation of any Critical Natural Habitats, whose definition includes those natural habitats which are either:

- Legally protected,
- Officially proposed for protection, or
- Unprotected but of known high conservation value.

In other (non-critical) natural habitats, Bank supported projects can cause significant loss or degradation only when:

- There are no feasible alternatives to achieve the project's substantial overall net benefits; and
- Acceptable mitigation measures, such as compensatory protected areas, are included within the project.

The Bank's current **Forests Policy** (**Operational Policy 4.36**) aims to reduce deforestation, enhance the environmental contribution of forested areas, promote afforestation, reduce poverty, and encourage economic development.

Combating deforestation and promoting sustainable forest conservation and management have been high on the international agenda for two decades. However, little has been achieved so far and the world's forests and forest dependent people continue to experience unacceptably high rates of forest loss and degradation. The Bank is therefore currently finalizing a revised approach to forestry issues, in recognition of the fact that forests play an increasingly important role in poverty alleviation, economic development, and for providing local as well as global environmental services.

Success in establishing sustainable forest conservation and management practices depends not only on changing the behavior of all critical stakeholders, but also on a wide range of partnerships to accomplish what no country, government agency, donor, or interest group can do alone.

The Forest Strategy suggests three equally important and interdependent pillars to guide future Bank involvement with forests:

- Harnessing the potential of forests to reduce poverty,
- Integrating forests in sustainable economic development, and
- Protecting vital local and global environmental services and forest values.

Cultural resources are important as sources of valuable historical and scientific information, as assets for economic and social development, and as integral parts of a people's cultural identity and practices. The loss of such

resources is irreversible, but fortunately, it is often avoidable. The objective of **OP 4.11 on Physical Cultural Resources** is to avoid, or mitigate, adverse impacts on cultural resources from development projects that the World Bank finances.

3. PROJECT DESCRIPTION

3.1 GENERAL

According to the EIA Terms of Reference, this section of the report shall "describe the proposed project including its location, scope, and activities associated with its design, construction and operation. Identify any offsite investments" Accordingly, this chapter is arranged as follows:

- Project Summary, including i) Type of Project; ii) Category of Project; and iii) Project Need and Location;
- Environmental Setting, providing an overview of the socio-environmental conditions within the Project Corridor; and
- Scope of Works, summarizing the works activities to be undertaken as part of the Project. It should be noted however, that at this stage of the Project there is no specific design and as such assumptions have been made about the potential scope of works.

3.2 TYPE OF PROJECT

The Project is a road rehabilitation project and comprises three specific outputs:

1. Rehabilitation of the R45 road, from Shirvan to Salyan
2. Rehabilitation of the R46 road, from Salyan to Neftchela
3. Rehabilitation of 100km of yet to be defined local roads within the vicinity of the R45 & R46 roads.

3.3 CATEGORY OF PROJECT

As stated in Section 2.7.2 above, based on the existing WP Operational Policies this Project falls under the World Bank's project **Category B**. This category is defined as:

"A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas--including wetlands, forests, grasslands, and other natural habitats--are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects."

Accordingly, an EIA compliant with the requirements of World Bank OP4.01 is required for the Project.

3.4 PROJECT NEED AND LOCATION

In the Azerbaijan Country Partnership Strategy (CPS), the IBRD-World Bank supports the four Pillars of development for Azerbaijan. Pillar II (Supporting sustainable and balanced growth of the non-oil economy) focuses on developing transport and infrastructure, while supporting financial services and private sector investments. Pillar IV (Improving environmental management) specifically puts emphasis on cleaning up legacy pollution, reducing carbon emissions, promoting biodiversity, supporting more sustainable natural resource management in selected areas, and strengthening natural disaster management.

Following the CPS for Azerbaijan, the Project's main objective is thus, to reduce road transport costs and improve access, transit, and road safety within Azerbaijan's transport corridors, through the rehabilitation of several roads, specifically in this report the R45 and R46 roads. For road users, the Project would lead to better road quality meeting mid-term traffic projections, better safety standards, lower travel costs, and shortened travel time within the same alignment.

The Project entails the rehabilitation of the below two regional roads and up to 100 km of local roads connected to them:

- 41km long R45 Shirvan-Noxudlu-Salyan Road;
- 42 km long R46 Salyan-Neftchala Road.

This assignment will enable works contracts to be awarded for the two road sections and related local roads.

The R45 is an important road connection between the towns of Shirvan and Salyan and the M6 and M3 highway corridors. From the intersection with the M6 Shirvan-Sabirabad road, 1.4 km west of the Kur River bridge, the road follows in a southern direction broadly parallel the River Kur until it passes under the M3 Alat Masalli Highway, which is under construction, and intersects with the Alat-Salyan road immediately north of the town of Salyan. The landscape is flat.

The R46 connects the regional administrative capitals of Salyan and Neftchala. Starting from the Alat-Salyan road in the centre of Salyan, the road follows the River Kur in a roughly south-west direction, passing through several settlements, before entering the north side of Neftchala. Both roads pass through the Kur River floodplain which is predominantly flat and are "Republica" category roads.

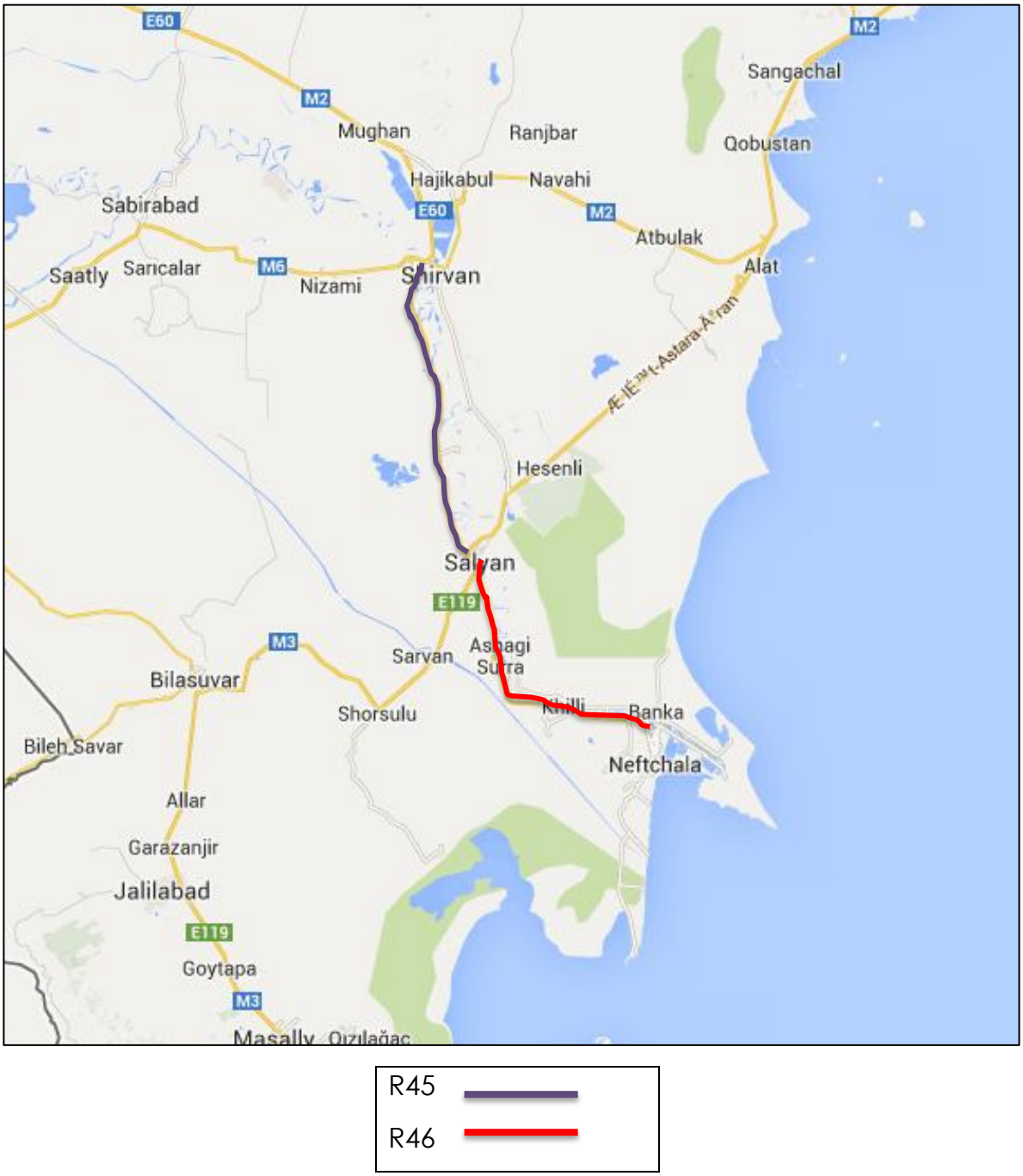
Figure 3-1 provides a location map of the two roads within the context of Azerbaijan. A schematic presentation of the R45 & R46 road alignments are provided by **Figure 3-2.**

3.4.1 Indicative Implementation Arrangements

The Project is to be implemented by the Azeryolservis (ARS) under the aegis of the Ministry of Transport. The GoA intends to use funding from the Second Highway Project loan/credit towards consulting services for the preparation of the Environmental and Social Assessment Reports and Environmental Management Plans for the rehabilitation of these regional and local roads.

Figure 3-1: Location Map, Project Corridor.

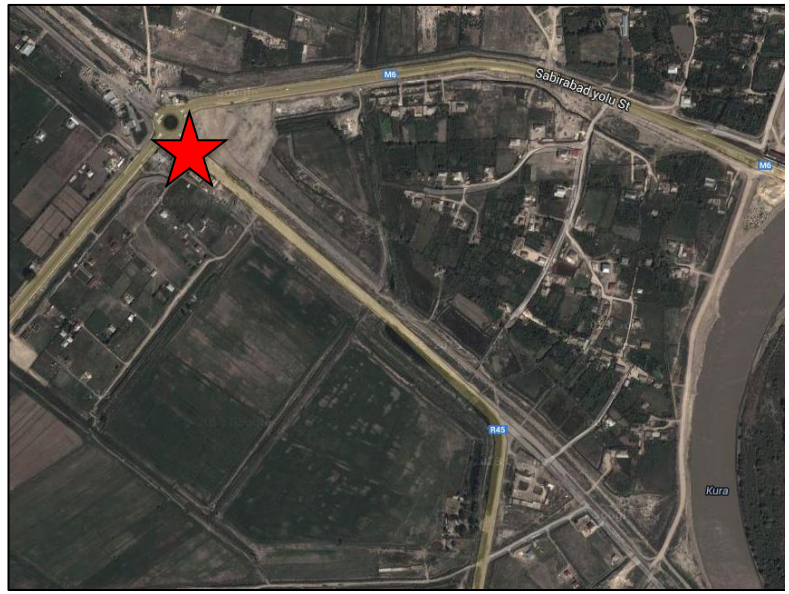
Figure 3-2: Road Locations (R45 & R46)



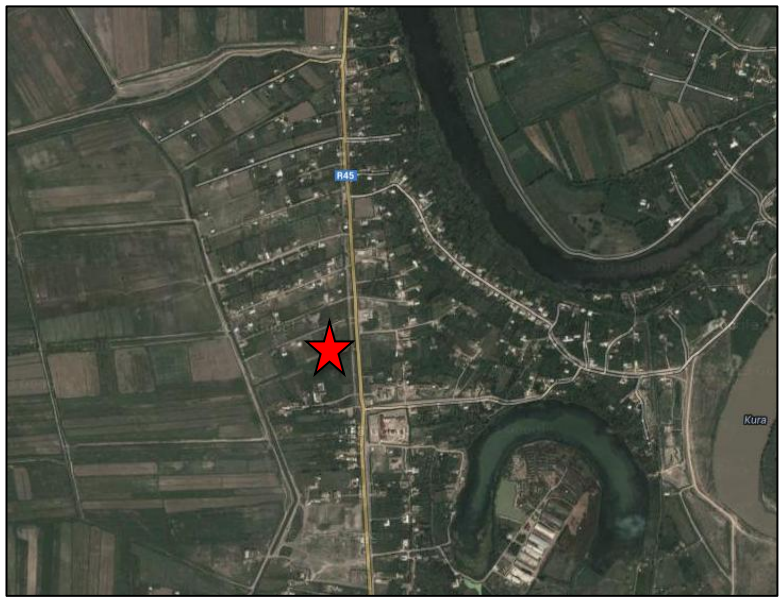
3.5 ENVIRONMENTAL SETTING

The following tables (3-1 & 3-2) describe the general environmental and social conditions for both the R45 and R46 roads.

Table 3-1: R45 Environmental Setting

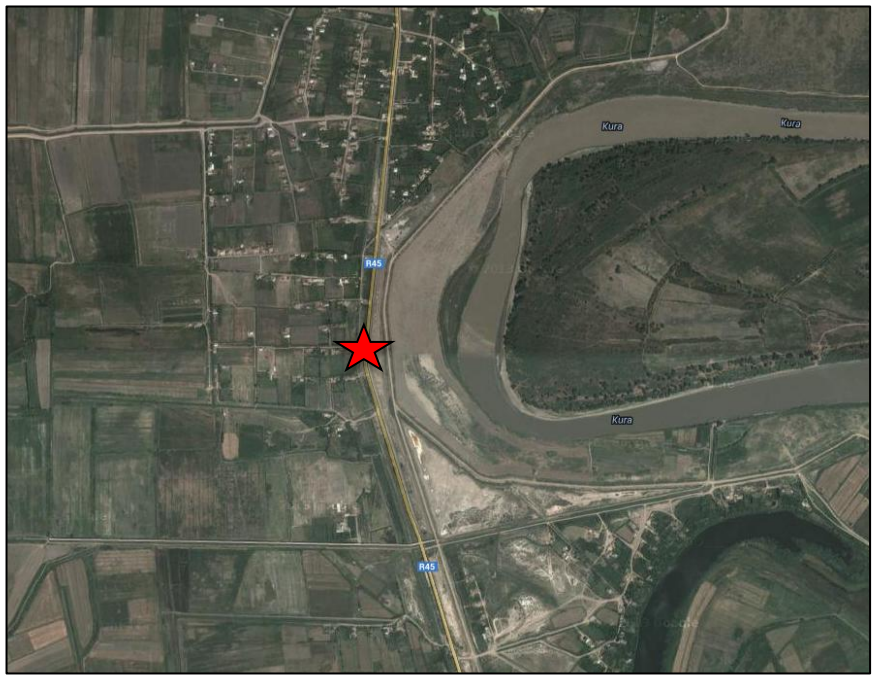
Km	Description
0.0	The Project Road commences south west at the junction with the M6 west of Shirvan City and one kilometer west of the Kur River Bridge (see photo and location map below). At the very start of the road several shops can be observed, none of which are located within the RoW. The asphalt surface finishes after about 25 meters whereupon the road becomes a graded gravel/earth surface which is currently extremely muddy. The surrounding environment comprises open scrubland / grazing land. Much of the area around Shirvan comprises oil fields and as such little land immediately around Shirvan is used for alternative purposes, such as agriculture.  
0.9	The road makes a right turn southwards at Km 0.9 and rejoins an asphalt surface. This is characteristic of the whole road with parts comprising asphalt and other parts a graded earth surface.
1.5	At Km1.5 an oxbow lake appears within 10 meters of the left hand side of the road. The oxbow lake is a remnant of the Kur River which flows some 200 meters away on the left side of the road. The Project Road broadly follows

	the flow of the Kur River south to Salyan, although it can never be directly observed from the Project Road itself due to the heigh embankments that line the Kur to prevent flood impacts.
2.1	The road continues to traverse flat open land until Km 2.1 (see photo and location map below) where several houses can be observed along the left side of the Project Road and farmland to the right. The houses mark the commencement of an urban ribbon of development along the Project Road which lasts to around Km 5.6. Within this area a number of trees (Willow and Elm) were noted within the RoW. In addition a school (see photo below) was noted within 40 meters of the Road centerline at Km 4.0. In general, most of the residential properties in this section were set well back from the road and are considered unlikely to be significantly affected by Project works.



5.6	The Project road soon leaves the residential areas and traverses a southerly path broadly parallel with the Kur

Table 3-1: R45 Environmental Setting

	River. This sparsely populated portion (around Km 5.6 (see photos and location map below)) of the road is characterized by flood protection embankments to the left of the road (between 100 and 400 meters from the road) and agricultural land to the right side of the road. The road crosses a small irrigation channel at Km 6.8, and these channels should be protected during Project works to ensure irrigation water flow is not disrupted. A mosque was noted at Km 8.4 whereupon the road condition improves. Various medium and low volatage transmission lines can be observed in this area crossing above the road and coordination with utilities providers should be undertaken by the Contractor during the Project works to minimize disruption to supplies. The road passes through the village of Polatogay at Km12.5.
	 
14.3	The Project road continues to traverse the Kur river floodplain sitting on a raised embankment of approximately two meters height (Km14.4 (see photo and location map below)). The road passes through small settlements

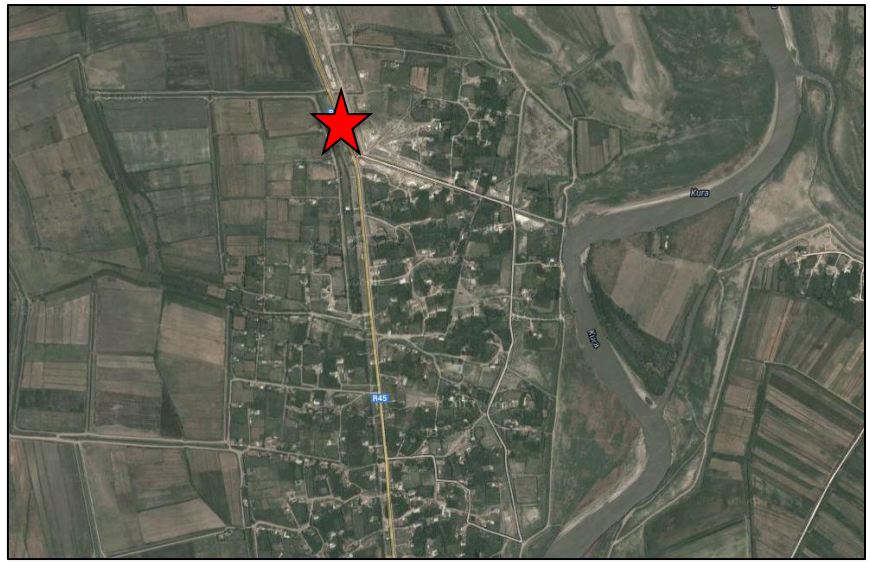
	such as Azadkend where gas supply pipes can be noted close to the roadside. Coordination with the gas supply utility will be needed to ensure that supplies are not disrupted to villagers. A school was noted within 50 meters of the right side of the road at Km15.2. After Km 17 the Project road continues in an area dominated by agricultural activity for around eight kilometers. A graveyard was observed within 20 meters of the road at Km17.5, this is unlikely to be affected directly by Project works. The road condition in this portion is very poor and traffic volumes are very low.
	 
22.4	At Km 22.4 the road comes very close to some mature popular trees (see photo and location map below). It is possible that a number of trees will need to be cut due to increase of road width and its associated embankments. This issue is discussed further in Sections 4 and 5 of this report. After Km 23 the road enters Hankechen village where all properties are set well back out of the right of way. In fact few, if any properties on both the R45 and R46 are located within the RoW.

Table 3-1: R45 Environmental Setting

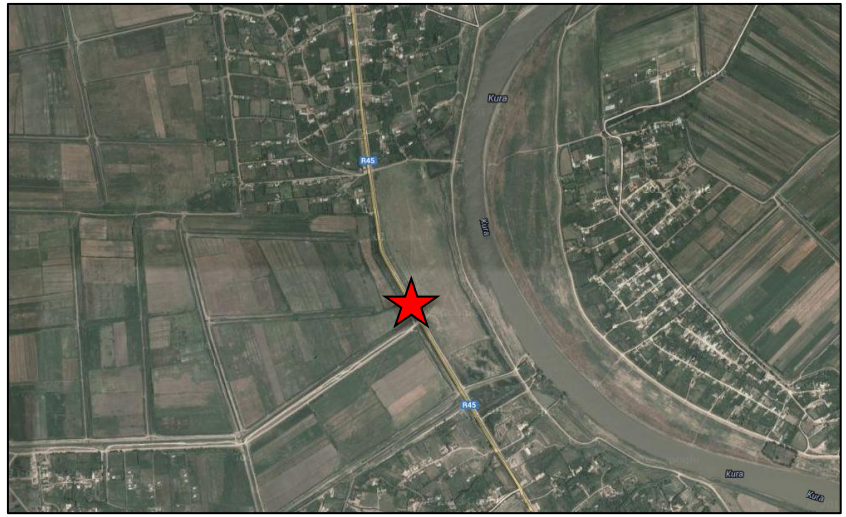
		
25.2	As the road leaves Hankechen after Km25 (see photo and location map below), the road continues to traverse the wide Kur floodplain. Sheep were noted grazing on the right side of the road where a railway line also becomes visible within a hundred meters or so of the road. The railway continues southwards broadly parallel with the Project road until it reaches Salyan.	

Table 3-1: R45 Environmental Setting

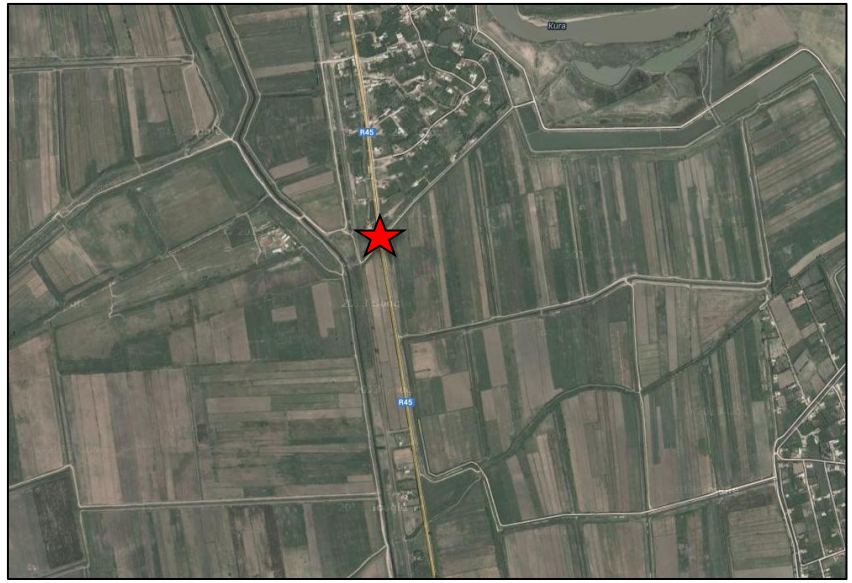
		
26.1	Around Km 26 the road condition improves significantly (see photo and location map below). Several mature White Populars can be seen adjacent to the left side of the road in this area. In such instances it is recommended that the designers propose asymmetrical widening in these areas to prevent mature trees being cut where widening can occur on the opposite side of the road where there is an absence of trees. The Project road continues through farmland and small settlements for a number of kilometers. The road continues to be flat and no significant environmental issues noted. The road crosses the occasional irrigation channel at Km30.4 & 32.7.	

Table 3-1: R45 Environmental Setting

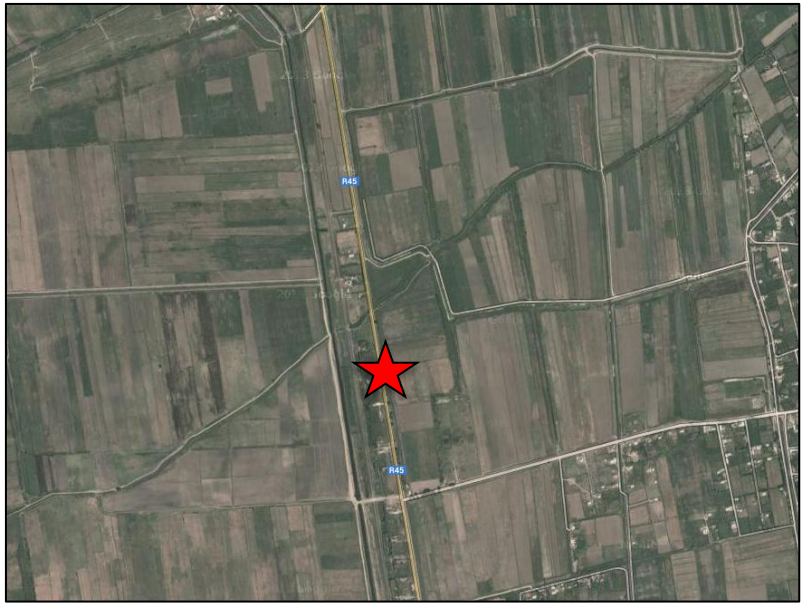
		
34.1	At Km 34.1 the road enters a small village where there road sits quite tight within residential land either side of the road (see photo and location map below). Gas pipes were are noted lining the road side properties. Traffic volumes are still very light in this portion of the Project Road.	

Table 3-1: R45 Environmental Setting

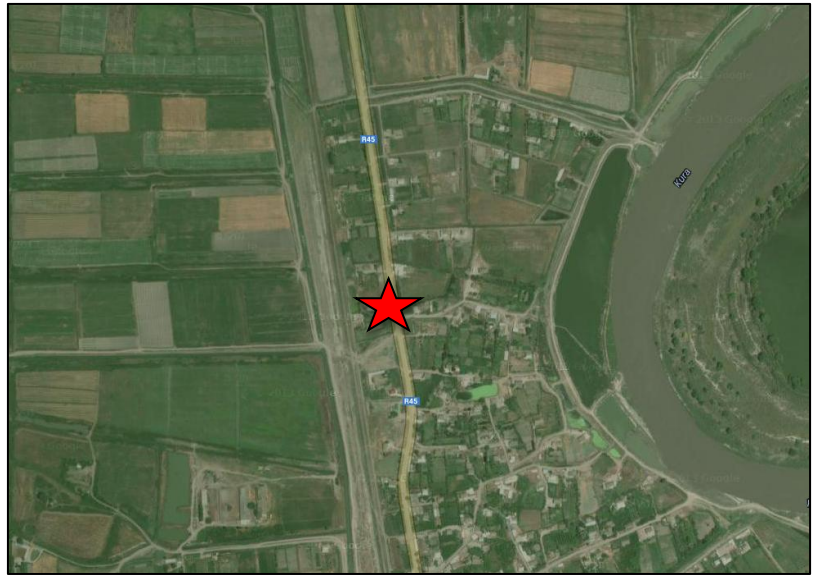
		
40.6	The road eventually opens out into fertile farmland as it continues south to Salyan. The new M3, currently under construction, crosses over the Project road at Km 39.2. This area would potentially make a good location for a construction camp as there is little residential proprties and it is more than 500 meters from the Kur River, it is also within a couple of kilometers of Salyan, which is a good labour pool. The Project road enters the suburbs of Salayan at Km 40.6 (see photo and location map below) and concludes at Km 41.4 with the junction with the exiting M3.	

Table 3-1: R45 Environmental Setting

Table 3-2: R46 Environmental Setting

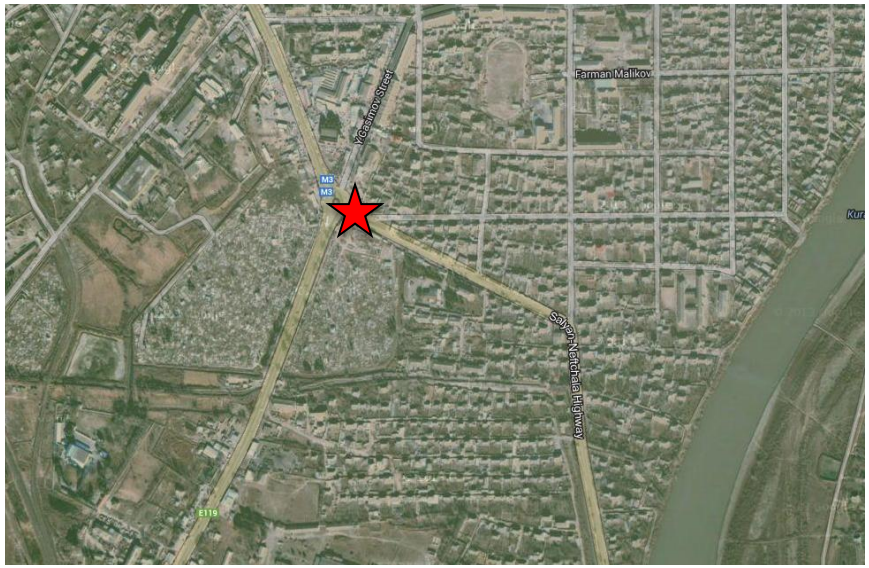
Km	Description
0.0	The Project Road commences at the junction with the M3 road in the center of Salyan (see photo and location map below). The road condition in this suburban area is good with all properties, both domestic and residential, set back out of the RoW. Traffic volumes in this portion of the road are relatively high as local traffic flows too and from the M3. The main potential socio-environmental issues in this section of the road will relate to noise, public health and safety as heavy vehicles and machinery work in this section. A hospital was noted within 20 meters of the right side of the Project Road at Km 1.2.  
2.2	At Km 2.2 the residential properties of Salyan suburbs start to thin out (see photo and location map below). However, what is noticeably different about the R46 than the R45 is that urban ribbon development continues for long stretches along the Project Road, as such it is sometimes difficult to tell when one village ends and another starts. Traffic volumes are also noticeably higher on this road than the R45. The road crosses a small

Table 3-2: R46 Environmental Setting

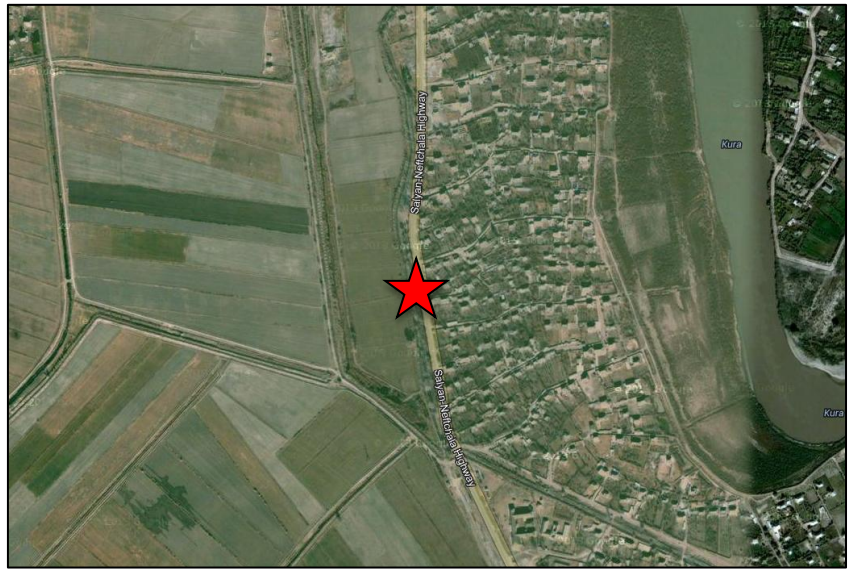
	irrigation channel at Km 3.0 and passes a school at Km 3.1.  
8.5	After Km 6.0 the road enters an area of farmland (see photo and location map below). Irrigation channels intermittently cross the road (Km 6.6, Km 8.1). In these areas roadside trees were noted often in close proximity to the road. The types and numbers of trees that may potentially be felled as part of the requirements of the Project have been estimated in Section 5 of this report. Until a detailed design is prepared for the Project the exact numbers of trees to be cut cannot be provided.

Table 3-2: R46 Environmental Setting

	 
17.4	At around Km 17 the road turns south easterly towards Neftchela. It passes through several more villages such as Ashagi Surra, Kur Qaraqubac (see photo and location map below) and Gadimkand. None of the properties in these villages are located within close proximity to the road. The Pavement condition starts to deteriorate slightly at around Km 18.0. Mosques and schools can be noted within these villages, however nearly all are set back more than 50 meters from the Project road and are unlikely to be significantly affected by noise issues, both in the short and long term phases of the Project.

Table 3-2: R46 Environmental Setting

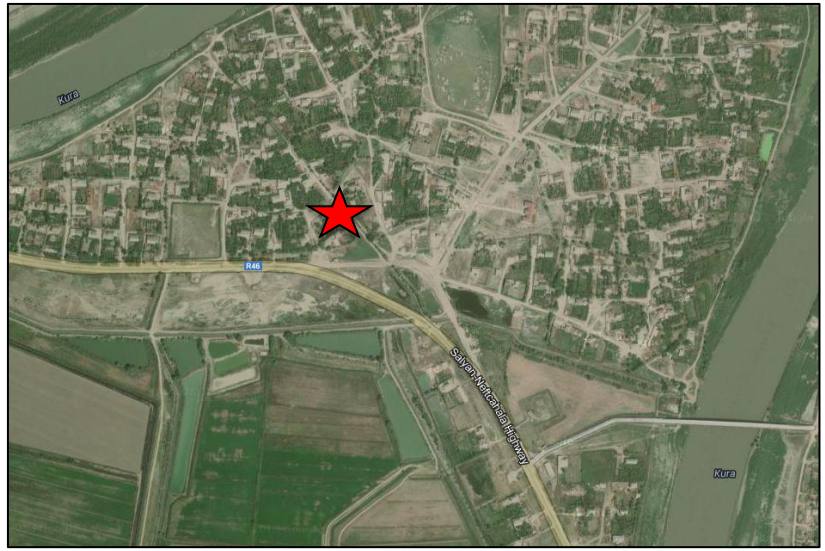
		
21.4	At around Km 21 the road moves to an easterly direction. Long strips of urban development continue as the road passes through Astanli (see photo and location map below) and Xilli villages. At Km 27 urban properties diminish as the landscape becomes dominated by oil fields. The Project road crosses its only bridge (15 meters) at Km 29.6. The landscape is now dominated by agricultural and grazing land. Turtles and toirtoises are commonly found in vegetation close to the roadside in this area. Marsh Harriers were also observed as the road passes, at times, within 100 meters of the southbank of the Kur.	

Table 3-2: R46 Environmental Setting

		
42.0	After Km 38 the road traverses an urban ribbon until it reaches its end at Km 42 in Neftchela. Neftchela appears a rather souless place, (see photo and location map below) typical of many such small towns in this area of Azerbaijan.	

Table 3-2: R46 Environmental Setting

3.6 TYPICAL ROAD CONDITIONS

The road conditions for all three Project components vary considerably along their alignments. **Figures 3-3** to **3-6** illustrate these varied conditions and indicate the need for the Project rehabilitation works.

Figure 3-3: Deteriorating Asphalt (R45)

Figure 3-4: Crumbling Embankment (R45)

The two photos above illustrate a section of the R45 where the asphalt surface can still be observed but has deteriorated considerably.

Figure 3-5: Intact Asphalt (R45)

In other sections of the R45, and more specifically on the R46, the asphalt surface is still intact, although it is starting to deteriorate around the road shoulders (**Figure 3-5**).

Figure 3-6: Completely Deteriorated Road Section (R45)

On other portions of the R45 (and to a significantly lesser extent the R46) the road surface has deteriorated to such a degree that the road is a mix of mud and the remaining asphalt and base material (**Figure 3-6**). These areas become extremely difficult to drive on during periods of heavy rainfall without 4x4 vehicles.

3.7 SCOPE OF WORKS

The scope of works for both the R45 can typically be divided into design, pre-construction and construction activities. The following section provides a summary, based on similar types of road rehabilitation projects, of the potential activities that may occur during each activity.

3.7.1 Design

During this phase of the Project detailed designs will be prepared. A Design Consultant shall prepare a detailed engineering design for rehabilitating the R45 and R46 and each of the local roads. In doing so, the Design Consultant shall prepare all documents necessary for the approval, bidding and construction of the works. These documents include, but are not necessarily limited to, detailed drawings, specifications, bill of quantities, cost estimates and traffic management plans. The detailed engineering design should incorporate recommendations to be produced as a result of the environmental and social assessments and the bill of quantities shall reflect all the costs associated with the implementation of the Environmental Management Plan. The Design Consultant shall also ensure that all aspects of the design takes full account the historical occurrence of severe flooding and the potential for future floods to affect the roads.

3.7.2 Pre-construction

During this phase of the Project typical activities may include:

- Site Clearing Works – The following works may occur:

  - Clearing and grubbing.
  - Demolition, removal and disposal of existing fences, structures/buildings or parts of structures or buildings.
  - Removal and disposal of traffic signs, sign posts and their foundations.
  - Demolition, removal and disposal of existing culverts, inlet and outlet structures, headwalls, concrete drains, channel lining, and erosion protection works.
  - Removal of and any other natural or artificial objects within the RoW.
  - Backfilling and compacting cavities remaining after the removal of trees, stumps, or any other incidental works.
  - Removal and disposal of all vegetation and debris within the designated limits of the Right-of-Way.
  - Any other works incidental to demolition, tree cutting and site clearance.
- Removal of Trees – According to the procedure outlined in Section 5.5.1.2 of this report.
- Relocation of Existing Services - The Works include the relocation of all services affecting the construction of the Project Road within the ROW. The services include the following:
  - Water mains;
  - Overhead electric supply lines;
  - Gas pipelines; and
  - Sewer mains.
- Construction Environmental Management Plan (CEMP) - During this period the Contractor should prepare his own CEMP to conform with this EIA and its EMP. The CEMP should ideally be completed with 30 days of the signing of the Contract to ensure that all EMP measures are included within the Pre-construction phase.
- Traffic Management Plan - The Contractor submits its Traffic Management Plan (TMP) to the CSC for approval. The Plan will also be an Annex to the CEMP

3.7.3 Construction

No design is currently available for any of the Project roads, although it is known that there will only be very minor changes to alignments (to accommodate safe designs) and that almost all of the rehabilitation works will occur within the RoW. The preliminary specifications of the road indicate that it will comprise a similar standard to the M6 road between Hajiqabul and

Horadiz (see **Figure 3-7**), i.e. roads will have a carriageway width of 7.5 m (2 x 3.75 m lanes) with two 3.75 m shoulders of which 0.75 m is be paved and within urban areas a carriageway width of 9.0 m with a footpath of 1.0 to 1.5 m width each side will be required. Design speeds of 100 km/h will be adopted for flat and undulated terrain and 50 km/h for urban areas. Bridges and culverts will be reconstructed or rehabilitated. Traffic safety features such as lighting, pedestrian crossings, road signs, road marking will also be incorporated.

Figure 3-7: The Newly Constructed M6

Given the flat topography of the Project area and a general lack of surface water crossings, rehabilitation works are anticipated to comprise the following:

Culverts - Project works will include the survey, investigation, design and construction of cross drainage structures (culverts), including inlet and outlet structures and associated works. Cross drainage works may typically include:

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

New and extended cross drainage structures should be constructed only after a detailed engineering assessment of the actual site conditions and cross drainage requirements.

Other Drainage Structures - Surface runoff from the carriageway and all other pavements, and embankment slopes should be discharged through longitudinal drains designed for adequate cross section, bed slopes, invert levels and the outfalls. The Works may include construction of the drainage system components in urban and rural areas.

Earthworks – Typical earthworks may include the following:

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

Bridges – One small bridge on the R46 will be constructed during the project works. The construction of the bridge may include the following works:

- Foundations.
- Substructure including bridge bearings.
- Superstructure, including construction of expansion and deformation joints and footpaths.
- Deck pavement including hydro isolation, drainage, hand railing, and conduits for services.
- Approach slabs.
- Slope treatments in front and around abutments.
- Construction and maintenance of traffic detours.
- Designed for the life expectancy of 75 years.

Figure 3-8: R46 Bridge (Km 29)

Removal of Asphalt – Removal of any existing bituminous pavement layers and stockpiling this material may be required. The existing bituminous pavement material removed from the section of the road should be stockpiled at a specified locations determined by the CSC.

Permanent Ancillary Features - The exact locations of bus stops will be finalized during the design phase of the Project.

Quarries & Borrow Pits - The exploitation of borrow pits and quarries will be conducted by licensed companies or the Contractor shall obtain its own licenses. The exact locations of borrow sites will be determined by the Contractor and specified within the CEMP. The Project will not implement any exploration activities from illegal sources.

As an indicator the following sources (**Table 3-3**) may be available. A detailed discussion of the environmental characteristics of these areas is provided by Section 4.

Table 3-3: Potential Borrow Sites

#	Location and Name	Material
1	Kalmas	Embankment
2	Babazanan	Embankment
3	Bahramtepe	Gravel and sand

Asphalt Plants - The Contractor will be responsible for ensuring the asphalt facilities comply with the EMP and that all necessary permits to operate are obtained from the local authorities. **Table 3-4** provides a list of the required permits for construction and operation of Asphalt Plants.

Table 3-4: Asphalt Plant Permit Requirements

#	Type of Permit	Issuing Authority
1	Permission on establishment	Local Executive Power
2	Agreement with land owner (if land is private or municipal)	Municipality or Physical Person
3	Permission on establishment	State Expertise Department of MENR
4	Permission on exploitation	Ministry of Emergency Situations
5	Ecological Passport	State Expertise Department of MENR
6	Inventory of exhaust emission to the atmosphere	State Expertise Department of MENR
7	Maximal Allowed Emission	State Expertise Department of MENR

Water - Non-potable water will be derived from the Kur River. The locations of the extraction points have yet to be determined, although they should be approved by the CSC prior to the start of extraction. Potable water will also need to be sourced for construction camps. **Table 3-5** provides a list of the requirements and permits for potable and non-potable water.

Table 3-5: Water Supply Requirements / Permits

#	Requirement / Permit	Issuing Authority
1	Technical water delivery permit	Local Su-Kanal department
2	Agreement on potable water supply	Azersu
3	If water supplied by any other organization or by Contractor (ex. artesian well) laboratory test is required	Any official laboratory that can approve that water is meet GOST 2874-82 requirements

Construction Camps - Camp sites will be selected keeping in view the availability of an adequate area for establishing camp sites, including parking areas for machinery, stores and workshops, access to communication and local markets, and an appropriate distance from sensitive areas in the vicinity. Final locations will be selected by the Contractor after the approval from the CSC. Environmental impacts of construction camps are discussed in Section 5.

The area requirement for construction camps will depend upon the workforce deployed and the type and quantity of machinery mobilized. In view of the area required, it will not be possible to locate camp sites within the RoW and the contractors will have to acquire land on lease from private landowners. The construction camp will have facilities for site offices, workshop and storage yard, and other related facilities including fuel storage. The Contractor will provide the following basic facilities in the construction camps:

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

Detailed criteria for siting of construction camps and establishment of facilities are given in the EMP. **Table 3-6** provides a list of the requirements for establishing and operating a construction camp.

Table 3-6: Construction Camp Permit Requirements

#	Requirement / Permit	Issuing Authority
1	Permission on establishment	Local Executive Power
2	Agreement with land owner (if land is private or municipal)	Municipality or Physical Person
3	Permission on establishment	State Expertise Department of MENR
4	Permission on exploitation	Local Department of Fire Safety of Ministry of Emergency Situations

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

Road Safety - The scope of the Permanent Works includes the planning, manufacturing and installation of traffic signs and application of pavement markings along the entire length and for all features of the Project Road. The Contractor must also provide all traffic signs required for the Project Road according to the standards referenced in the Employer's Special Requirements. The following types of traffic signs must be installed along the Project Road:

1. Warning Signs

2. Regulatory Signs
3. Signs for all off-ramp/adjacent roads
4. Information and Direction Signs

In addition, the Works include the construction/manufacturing and installation of different types of safety barriers steel guardrail, kilometer posts and guide posts in accordance with the Employer's Requirements.

The main road safety benefits the project will deliver are the following:

- Reduced risk of vehicles leaving their lane to avoid potholes and surface deformations;
- Reduced risk of accidents due to road hazards, e.g. flooding;
- Improved sight distances due to improved vegetation control;
- Better separation between pedestrians and vehicles; and
- Better night driving conditions due to wider carriageway and improved pavement centerline markings.

Some of these advantages could be partially offset by the higher speeds which will be possible after the road improvements.

3.8 LOCAL ROADS

There are about 240 km of local roads under Azeryolservis management that connect or relate to R45 and R46. Up to 100 km of these local roads will be rehabilitated under the Project. The selection of the local roads will be in consultation with the local communities with a pro-poor focus of improving access to markets and services and facilitate livelihood activities.

The reconstruction of these roads is expected to follow the existing road alignment, with the possible exception of limited realignments to improve geometric characteristics and eliminate safety hazards. The extent of any realignment will be limited as land acquisition is to be avoided. However, there might be some impact, most of which is expected to be temporary, to roadside vendors and small businesses during civil works. **Figure 3-9** illustrates the potential locations of the local roads in relation to the R45 and R46. **Figures 3-10** to **3-12** illustrate the typical conditions of the potential local roads.

Figure 3-9: Potential Local Road Locations

R45	Local Roads
R46	M3

Figure 3-10: R45 local road entrance (Km 31)

Figure 3-11: R45 local road (Km 37)

Figure 3-12: R46 Local road (Boyat Road, Km 28)

3.9 PROPOSED SCHEDULE FOR IMPLEMENTATION

The Project is scheduled to commence in 2015 and is expected to take at least 2 years to construct, until its completion in mid to late 2017.

3.10 LIFE SPAN OF THE PROPOSED PROJECT

The proposed project is designed for a life span of 20 years provided that routine and periodic maintenance is carried out.

4. BASELINE DATA

4.1 GENERAL

According to the EIA Terms of Reference, this portion of the report shall "clearly identify the study area, i.e. the project area of influence, including the whole stretch of each road, and within certain radius of the road and ancillary facilities such as borrow pits, disposal sites for construction wastes, access roads; assemble the existing data, evaluate and present baseline data on the relevant environmental characteristics of the study area including the physical, biological, cultural property and socio-economic conditions. Any changes anticipated before the project commencement should also be identified."

Accordingly, this section of the report discusses the existing environmental and social conditions within the Project corridor of the R45 & R46 Roads under the following headings:

- Physical Resources (air quality, hydrology, topography, etc);
- Biological Resources (flora, fauna & protected areas); and
- Socio-Economic Resources (infrastructure, land use, noise, cultural resources, etc).

4.2 PHYSICAL RESOURCES

4.2.1 Geology

The geology of Azerbaijan is dominated by two major mountain ranges, the Greater and the Lesser Caucasus, and the intermontane Kura River valley (sometime called the Kura depression) located in between the two (**Appendix B, Figure B-1**). The Caucasus is part of the Alpine-Himalayan mountain range that formed in response to the closure of the Tethyan Ocean and subsequent collision of the Eurasian, African, Arabian and Indian lithospheric plates. Continental collision started about 5 million years ago and lead to thrust faulting and deformation of the Jurassic and Cretaceaous rocks in the Caucasus. The Afro-Arabian and Eurasian lithospheric plates still converge at about 28mm per year and associated fault zones (thrusts and steep strike slip faults) located along the margins of tectonically bound fragments form the focus of seismic activity.

The geological record of Azerbaijan is diverse and comprises often strongly deformed and folded sedimentary, volcanic-sedimentary, volcanic and terrestrial deposits of pre-Cambrian to Holocene age. Crystalline rocks of igneous and metamorphic origin are far less common and occupy much smaller areas largely restricted to the Lesser Caucasus. Alluvial fans and molasse type deposits (erosion products derived from the uplift and erosion of, in this case, the Caucasus Mountains) are ubiquitous in the foreland of the mountain ranges.

The central and eastern lowlands of Azerbaijan are occupied by the Kura River intermontane basin that extends over c. 86.000 km². It comprises a several kilometre thick sequence of molasse type sediments, which unconformably rest upon subsided Jurassic and Creatceous rocks. Prevailing deformation has led to an internal structuring of the Kura intermontane basin into several domains (or sub-basins) that are known from seismic data and borehole evidence. Towards the Caspian Sea Basin in the east, the thickness of the geologically young molasse-type sediments reaches 6-8 km. Over much of the central and eastern lowlands, the solid geology is covered by varying thicknesses of alluvial deposits (sand, gravel, mud, loam) related to the Kura River and its tributaries that erode the high relief Caucasus Mountains. A thin top soil layer is commonly present.

4.2.2 Topography

The Project Corridor lies within the Kura Intermontane Depression (Kura-Araz geographical district). The altitude of the Project area, which is essentially flat, actually lies below sea level for most of its extent varying between -21 and -27 meters. **Figure B-2, Appendix B**, illustrates the topography of Azerbaijan and the depression in which the Project area is located.

4.2.3 Soils

Most of the Project Corridor is formed by sierozem (meadow gray soil), which occur over a 120 km zone (see **Figure B-3, Appendix B**). Meadow gray soil is typical for altitudes of up to 150 m asl and dry climates with maximum rainfall of 200 mm. Meadow gray soil is generally semi-dry, dry steppe, light loamy kind, which is suitable for winter pastures and arable land (cereals, cotton). The agricultural potential is classified as low to medium.

Numerous patches of salt marshes occur in Salyan district. They are especially frequent on the territory of Shirvan National Park and its fringes. Salt marshes are restricted to the lowlands with altitudes <100 m. Salt marches are not productive in agricultural terms – only some species of saltwort (*Salsola* spp.) may grow here, so that they are only suitable for pasture. **Figure B-4, Appendix B**, illustrates how the soils in this area to the north of the R46 are highly salinized.

4.2.4 Climate and Air Quality

This Section is divided into three sub-headings; Climate, Climate Change and Air Quality.

Climate – The Project Corridor of both R45 and R46 belongs to the Aran region of Azerbaijan which is characterized by dry semi-desert climate. This area has very hot and dry summer and moderate warm winter. Average annual precipitation is no more than 200-400 mm. Most rainy seasons are late autumn and winter (October-March – about 50% of annual precipitation), but even in this time quantity of precipitation is usually no more than 100-150 mm for R45 and 150-200 for R46. The driest season is summer with about 5-10 mm of precipitation per month (June-August – about 10% of annual precipitation). Generally number of precipitation within April-September half-year period is less than 100 mm. The number of days with precipitation ≥0.1 mm annually is 60-70 for most part of the area and 70-90 for vicinity of Neftchala town. Such climatic phenomenon as hails and thunderstorms are very rare here: the number of days with hail is less than one and thunderstorm is less than five annually. The number of snow days does not exceed ten annually. The average annual temperature is 14 - 14.5°C: over 27°C in July and 0-3°C in January. Absolute temperature maximum is +41°C and minimum -22°C.

The main direction of wind for the R45 is east (about 24%), north-east (about 22%) and south-east (about 15%) annually. R46 is characterized by north-east (26%), south-east (21%) and east (15%) annually. However main direction in winter season is west. Most typical wind speed is 2-5 m/s (53%). Winds with speed 6-10 m/s are also not rare here especially in summer time. Strong winds (with speed over 30 m/s) are very rare in the Project area. Besides, there are sea breezes quite typical for eastern section of R46 in the warm periods of the year (from April to September-October). They are characterized by daily movement. During a day time breeze blows from the sea to the land and during a night from land to the sea. A wind rose for Salyan, showing an annual average with predominantly easterly winds at 25 m/s, is presented by **Figure B-5, Appendix B**.

Climate Change – According to many studies, climate change may lead to more extreme weather events, such as flooding and storms. There have been no specific studies relating to climate change impacts within the Project Area, as such it is difficult to quantify what impacts may arise as a result of potential climate change in the region. It is possible that flood events from the Kur river may increase in the Project area, but there is no specific data to back up this claim. The Project itself is unlikely to lead to significant increases in greenhouse gas emissions, either regionally or globally.

Air Quality – No sources of industrial air emissions were noted within the Project Corridor. The main sources of other emissions to air can be classified as:

- Burning of fossil fuels for heating and cooking within the residential areas.
- Vehicle engine emissions; and
- Dust, including that generated from the movement of vehicles.

The main emissions from the combustion of fuel in vehicle engines include Nitrogen Oxides (NOx), Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), Carbon Dioxide (CO2) and Particulate Matter (PM). At present rates, these emissions levels are relatively low due to the low volume of traffic on the road. Certain portions of the road are however, degraded to such an extent that vehicle movements in these areas create high volumes of PM or dust from the exposed surface, especially within the dry summer months. Heavy goods vehicles are a particular cause of these dust impacts.

4.2.5 Hydrology

Surface Water - Surface water resources in the Project Corridor include rivers, lakes, wetlands and irrigation/drainage systems.

The main natural watercourse in the area is the Kur River, which accounts for approximately 90% of the surface water resources in Azerbaijan, draining 68,900 km^2 or 80% of its territory. The Kur rises in Turkey and passes through Georgia before entering Azerbaijan on its 1,500 km journey to the sea (900 km in Azerbaijan) where it drains via the Mingechevir Reservoir into the Caspian Sea about 50 km south-east of Salyan town close to the end of the R46 in Neftchela. According to the Ecological Atlas of Azerbaijan (National Academy of Sciences, 2011), the Kur River in the Project area is classified as polluted (in R45 section) and highly polluted between Salyan and Neftchala (R46 section) – see **Figure B-7, Appendix B**. The river is organically and bacteriologically polluted by the discharge of inadequately treated or untreated wastewater from the eleven million people living in the catchment area. This is a major problem, with Azerbaijan being dependent on the Kur river for more than 70% of its drinking water supply. It also plays a key role for irrigation and other agricultural and industrial purposes and is important as a source for fish.

The Kur is recharged by melted snow (approx. 50%), groundwater (approx. 30%) and rainwater (approx. 20%). The Kur floods regularly during both spring (April-June) and autumn. The water flow in May-June makes up 60-70% of annual flow. The annual average discharge is 580 m^3/sec. Since the Mingechevir Reservoir was constructed (200km north west of Salyan), the extent of flooding has been reduced although serious flooding still occurs every 5-10 years. In May 2003, snowmelt from the Caucasus mountains led to flooding in Azerbaijan in eleven districts along the Kur and Araz rivers. In some areas, landslides were triggered. More than 6,000 families were affected,

around 2,000 houses damaged and more than 3,000 ha of agricultural land submerged and crops destroyed. Salyan and Neftchala were amongst the worst affected regions. Estimated losses were estimated to be US$50-60 million.

In the Salyan region, the Kur flows in an extensively meandering course. The minimum flow maintained in the river is around 354 m^3/s, which gives a channel width of about 230-260 m wide and a flow depth of around 4-5 m. Costs associated with repeated flooding of the Kur river in recent years have led to a proposal by the national irrigation authority to cut off one of the major meanders in Salyan town in an attempt to divert floodwaters downstream, with the aim of reducing local flooding and protecting property.

The main drainage canal in the study area is the Mugan-Salyan Canal (total length 37 km, irrigation area 68,000 ha). This watercourse is the major carrier of water used for soil washing and outwash. It is sourced from Kur River overspill (water which flows over weirs when it reaches a high level) primarily at Azadkand and augmented at a number of other locations, in particular at Salyan. The canal feeds water to, and accepts outwash from, a complex network of irrigation canals. During times of high water level in the Kur River, additional overspill enters the Mugan-Salyan Canal and is released into storage areas via secondary overspill weirs (these are weirs across which water flows once it reaches a high level) to reduce water levels.

Irrigation and drainage systems are essential for agriculture in Azerbaijan. Irrigation is the largest water user in the country: the total area with installed irrigation is 1.45 million ha, nearly 85% of the cultivated area. Cotton and grain are grown on irrigated land. Unsustainable irrigation practices in the region with inefficient use of water, together with lack of investment in maintenance of the system, have led to rising water tables, secondary bogging and salinisation of soils (see **Figure B-4, Appendix B**), and has ultimately resulted in loss of soil fertility.

A number of wetlands, permanent and temporary have also been identified in the Project Area. They include a lot of cut-off meanders or Oxbow lakes (see Figure 4-1). Akhmaz are closed, un-circulating water bodies originated by former river flow within its meander. During flooding time akhmazes are filling with river water, within other seasons they mainly feeding by filtration water. Table 4-1 & 4-2 provides a summary of the wetlands found within the Project Area and Figure 4-2 and 4-3 illustrates the locations of the Wetlands.

Table 4-1: R45 Wetlands

Ref #	Type	Approximate Location & Size	Ecological Value and Use	Species
1	Oxbow	Located between railway and Minbashi village, adjacent to the project road LHS. Size is about 0.67 km2.	Ecological value is high. Oxbow is surrounded by some reed and trees. Section adjacent to the road is seems quite clean. Due to sloping banks it is used for drinking of domestic animals and pond for domestic ducks and gees. Locals are also fishing there. Roadside café is placed under the trees on the bank.	Some sweet water fish species (mainly the same with Kur River), amphibians (*Rana ridibunda, Hyla savignyi*), reptiles (*Emys orbicularis*[a], *Natrix natrix*), numerous birds (manly gulls, coots and ducks in winter season; little grebes, herons, egrets and terns during breeding season) and various mammals occurred at the area and using this area as foraging and hunting habitat.
2	Oxbow	Located between Minbashi and Garaghaj villages in about 400 m LHS from the project road. Size is about 0.21 km2.	Ecological value is high. Oxbow is surrounded by reed overgrow and numerous wild trees. Additionally numerous fruit gardens of surrounded Minbashi village are creating breeding and foraging habitat for different species. Local people are using the oxbow for fishing and drinking of domestic animals and pond for domestic ducks and gees. Same time banks are littered with different domestic waste and probably sewages from surrounded houses are also discharging to this water body.	Some sweet water fish species (mainly the same with Kur River), amphibians (*Rana ridibunda, Hyla savignyi*), reptiles (*Emys orbicularis*[a], *Natrix natrix*), some birds (grebes, herons, egrets, waders, gulls and numerous passerines) and various mammals occurred at the area and using this area as foraging and hunting habitat.
3	Oxbow	Located at Beshdali village,	Ecological value is high. Habitat is	Some sweet water fish species (mainly the same

		in about 400 m LHS from the project road. Size is about 0.70 km2.	combination of open water areas with dens reed overgrowing. Oxbow is also surrounded by some trees and bushes. Partly polluted from adjacent village (western side) but partly keeps quite clean water and natural landscape densely occupied by wild fauna and used by local population for fishing and drinking place for domestic animals.	with Kur River), amphibians (*Rana ridibunda, Hyla savignyi*), reptiles (*Emys orbicularis*[a], *Natrix natrix*), some birds (*Tachybaptus ruficollis, Phalacrocorax pygmeus, Egretta garzetta, Bubulcus ibis, Nycticorax nycticorax, Ixobrychus minutus, Ardea purpurea, Circus aeroginosus, Porphyrio porphyrio*[b], *Himantopus himantopus, Larus ridibundus, Chlidonias hybridus* and numerous passerines) and various mammals occurred at the area and using this area as foraging and hunting habitat.
4	Oxbow	Located to the north from Poladtugay village, in about 800 m LHS from the project road. Size is about 0.08 km2.	Ecological value is quite low. The oxbow is small, shallow and seems to be declining in size. Located in some distance from any village it keeps clean water and used by local population for fishing and drinking place for domestic animals. Same time vegetation along the banks and on surrounded areas is very poor and includes just some grasses and small bushes which makes habitat unattractive for fauna.	Some sweet water fish species (mainly the same with Kur River), amphibians (*Rana ridibunda*), few visitor birds (*Tadorna tadorna, Egretta garzetta, Sterna hirundo, Merops apiaster, Upopa epops, Hirundo rustica*).
5	Oxbow	Located to the north from Chighigan	Ecological value is medium. The oxbow is quite small and	Some sweet water fish species (mainly the same with Kur River),

		village, in about 400 m LHS from the project road. Size is about 0.08 km2.	shallow. However located in some distance from any village it keeps clean water and used by local population for fishing and drinking place for domestic animals. This water body has very poor reed cover however surrounded by dense bush overgrows and trees.	amphibians (*Rana ridibunda*), reptiles (*Emys orbicularis*[a]), some birds (*Tachybaptus ruficollis, Phalacrocorax pygmeus, Egretta garzetta, Gallinula chloropus, Larus ridibundus, Chlidonias hybridus, Hirundo rustica* and others) including big breeding colony of Blue-cheeked Bee-eaters (*Merops superciliosus*) occurring in embankment of the ground roads surrounding this wetland and also adjacent to the Project road. Various mammals occurred at the area and using this area as foraging and hunting habitat.
6	Artificial fish ponds	Located to the south from Hankechan village, in about 400 m LHS from the project road. Size is about 0.23 km2.	Ecological value is low. The ponds are artificially created pits containing not very clean water with low volume of oxygen and high level turbidity. Different, mainly not native species of fish (mainly carps) are growing here foraging with compound feed. Ponds are quite deep with steep banks and thus can not be used as suitable habitat for many species. Vegetation is presented by one line of tamarisk bush.	Artificially growing fish species, small amount of reptiles (*Natrix natrix, Mauremys caspica*) and birds (*Larus ridibundus, Chlidonias hybridus*).
7	Artificial fish ponds	Located to the west from Tazakend village, in about	Ecological value is low. The ponds are artificially created pits containing not very	Artificially growing fish species, small amount of reptiles (*Natrix natrix, Mauremys caspica*) and

		1 km RHS from the project road behind the railway behind the railway line. Size is about 0.49 km2.	clean water with low volume of oxygen and high level turbidity. Different, mainly not native species of fish (mainly carps) are growing here foraging with compound feed. Ponds are quite deep with steep banks and thus can not be used as suitable habitat for many species. Vegetation is presented by narrow stripe of reed and few tamarisk bushes.	birds (*Circus aeroginosus, Larus ridibundus, Chlidonias hybridus, Hirundo rustica, Acrocephalus arundinaceus*). Some mammal species mainly typical anthropogenic animals such as Golden Jackal (*Canis aureus*) and Red Fox (*Vulpes vulpes*) can be observed here as well.
8	Artificial fish ponds	Located between Tazakend and Salmanli villages in about 1 km LHS from the project road. Size is about 0.05 km2.	Ecological value is low. The ponds are artificially created pits containing not very clean water with low volume of oxygen and high level turbidity. Different, mainly not native species of fish (mainly carps) are growing here foraging with compound feed. Ponds are quite deep with steep banks and thus can not be used as suitable habitat for many species. Vegetation is presented by one line of tamarisk bush.	Artificially growing fish species, small amount of reptiles (*Natrix natrix, Mauremys caspica*) and birds (*Sterna hirundo, Chlidonias hybridus*).
9	Artificial fish ponds	Located to the west from Salmanli village, in about 300 m RHS from the project road behind the railway behind	Ecological value is low. The ponds are artificially created pits containing not very clean water with low volume of oxygen and high level turbidity. Different, mainly not	Artificially growing fish species, small amount of reptiles (*Natrix natrix, Mauremys caspica*) and birds (*Sterna hirundo, Chlidonias hybridus*).

		the railway line. Size is about 0.13 km2.	native species of fish (mainly carps) are growing here foraging with compound feed. Ponds are quite deep with steep banks and thus can not be used as suitable habitat for many species. Vegetation is presented by one line of tamarisk bush.	

Table 4-2: R46 Wetlands

Ref #	Type	Approximate Location & Size	Ecological Value and Use	Species
1	Natural flooding area originated by Kur River	Located by the southern end of Ashagi Surra village in about 300 m LHS from the project road. Size is about 0.4 km2.	Wetland is totally dry out and not exists anymore.	
2	Artificial fish ponds	Located between Ashagi Surra and Kur Garabujag villages in about 50 m RHS from the project road. Size is about 0.2 km2.	Ecological value is low. The ponds are artificially created pits containing not very clean water with low volume of oxygen and high level turbidity. Different, mainly not native species of fish (mainly carps) are growing here foraging with compound feed. Ponds are quite deep with steep banks and thus can not be used as suitable habitat for many species. Vegetation is presented by narrow stripe of reed between ponds and some	Artificially growing fish species, small amount of reptiles (*Natrix natrix, Mauremys caspica*) and birds (*Larus ridibundus, Sterna hirundo, Chlidonias hybridus* and few passerine species).

			trees between ponds and road.	
3	Shallow wetland area	Located to the south from Hilli village in adjacent to the project road. Size can have some variation in different seasons of the year but generally is about 10 km2.	Ecological value is low. This wetland is originated in natural depression due to high level of ground water. Generally this is salt marshes with some natural salt shallow lakes and two mud volcanoes. Natural vegetation is very poor here and presented just by widespread saltwort patches. This territory is totally fenced and strictly protected by SOCAR company as numerous oil fields are placed here.	Territory is highly disturbed and quite polluted. The habitat is suitable for typical fauna species described in Fauna chapter. Density of animals population here is lower comparison other areas adjacent to the project road due to poor vegetation and disturbance.
4	Artificial fish ponds	Located in about 2 km to the east from Hilli village in about 70 m LHS from the project road. Size is about 0.1 km2.	This system of artificial ponds belongs to Sturgeon Plant. This territory is totally fenced and strictly protected by Plant.	Different sturgeon species artificially growing here.
5	Shallow wetland area	Located in about 2 km to the east from Hilli village in adjacent to the project road RHS. Size can have some variation in different seasons of the year but generally is	Ecological value is low. This wetland is originated in natural depression due to high level of ground water. Adjacent to the Wetland No 3 from east. Generally this is salt marshes with some natural salt shallow lakes. Natural vegetation is very poor here and presented just by widespread saltwort patches with some ephemeral grass species.	Small amount of amphibians (*Rana ridibunda*), reptiles (*Natrix natrix, Mauremys caspica, Emys orbicularis*[a]) and birds (*Himantopus himantopus, Charadrius alexandrinus, Ch. dubius, Larus ridibundus, Sterna hirundo, S. albifrons, Chlidonias hybridus, Galerida cristata, Oenanthe isabellina, Motacilla alba* etc.). Some mammal species

		about 7 km2.		mainly typical anthropogenic animals such as Golden Jackal (*Canis aureus*) and Red Fox (*Vulpes vulpes*) resident and Wolf (*Canis lupus*) in winter time can be observed here as well.
6	Artificial fish ponds	Located in about 4 km to the east from Hilli village in about 50 m LHS from the project road. Size is about 0.45 km2.	Ecological value is high. This is artificial fish ponds however they are very old and had been created more than 30 years ago and had been occupied by different local fauna species. Each pond is surrounded by dens and wide reed stripe and adjacent tamarisk bush patches, some are partly covered with reed. The ponds are separated from the project road by the water channel running in parallel to it.	Artificially growing fish species, amphibians (*Rana ridibunda, Hyla savignyi*), reptiles (*Emys orbicularis*[a], *Mauremys caspica, Natrix natrix*), different bird species (*Tachybaptus ruficollis, Pelecanus crispus*[c], *Phalacrocorax pygmeus, Egretta garzetta, Bubulcus ibis, Nycticorax nycticorax, Ixobrychus minutus, Ardea purpurea, A. cinerea, Aythya nyroca*[a], *Circus aeroginosus, Francolinus francolinus*[b], *Himantopus himantopus, Larus ridibundus, L. cacchinans, Chlidonias hybridus* and numerous passerines) and various mammals occurred at the area and using this area as foraging and hunting habitat.
7,8,9	Temporary artificial fish ponds	These ponds are stretched along the project road by both RHS and LHS. Estimated size (by the Google	Ecological value is quite low as most of ponds are new and seasonal thus ecosystems are not stable. Some sparse patches of reed are present at the ponds territories. Most of the ponds are separated from the project road by the water channel running in parallel to it.	Artificially growing fish species, seasonally amphibians (*Rana ridibunda*), sporadically reptiles (*Emys orbicularis*[a], *Natrix natrix*), periodically birds (herons and egrets, some gulls and terns, waders on migration and during winter season,

		maps) is about 2.5 km2 however at the time of area investigation most of ponds were dry.		passerine are mainly visitors during breeding season) and some typical mammals described above.

Groundwater – According to recent reports groundwater around Salyan occurs at around 3 m below ground level (bgl) and occasionally at 3-5 m bgl. Environmental mapping of the area (**Appendix B, Figure B-2**) indicate that goundwaters are less than 1 meter bgl at either end of the Project corridor, e.g. at Shirvan and Neftchela. The remaining areas of the Project corridor show an average groundwater depth of 1 to 2 meters. Over the years, the groundwater table in the area has generally become closer to surface following the influence of irrigation and drainage systems. As noted above, soils close to Neftchala are highly saline, and it is possible that groundwater in this area is also highly saline. The high salinity in this area is caused by the salinity of the water-bearing rocks of sea origin. High salt levels will potentially impact on the design life of standard concrete. Therefore appropriate sulphate resistant mixes will be required for parts of any structures in contact with saline soils or water.

Figure 4-1: Akhmaz of Kur River adjacent LHS to the R45 at Km 2.

Figure 4-2: Location of Wetlands (R45)

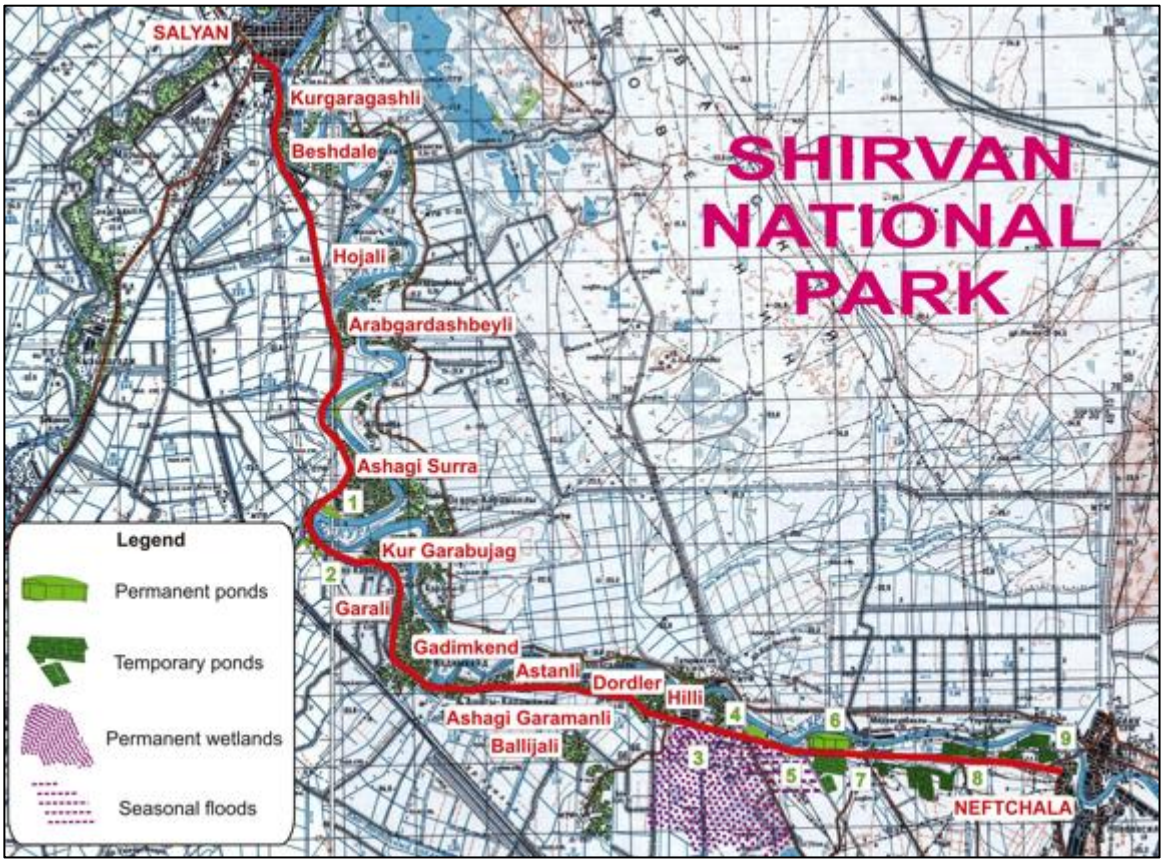


Figure 4-2: Location of Wetlands (R46)

4.2.6 Natural Hazards

Earthquakes of the magnitude 6 on the Richter-scale have been recorded in Salyan (see **Figure B-7**, **Appendix B**). Seasonal flooding from the Kur River is also a natural hazard discussed above in Item 4.2.5.

4.3 BIOLOGICAL RESOURCES

4.3.1 Flora

Biodiversity of flora is not particularly high as the whole Project Area is under strong anthropogenic pressure and the presence of overgrazing is visible. The Project Area is characterized by saltwort and ephemeral deserts and wormwood-saltwort semi-deserts with short period of vegetation. Spring vegetation is dominant over autumn vegetation. Saltwort vegetation is more distributed here than wormwood. Wormwood formation is mostly developed here on the background of ephemeral grass vegetation. *Salsola dendroides* is edificatory for saltwort desert. The grouping of two edificatory (Artemisieto-Salsoletum nodulosae) plays an important role and is widely distributed

mainly within corridor of R45. The main seasons of ephemers' vegetation are spring and autumn and spring vegetation dominates over autumn. The quiescent period of ephemers coincides with the most dry season of the year. The woody-shrubby vegetation is presented here by few numbers of tamarisk shrubs and forms no more than 1% of all plants.

Such species as *Halocnemum strobilaceum, Halostachys caspica, Suaeda microphylla, Petrosimonia brachiata, Gamanthus pilosus* and *Salsola crassa* etc. are most characteristic species for salty lands. Cereals are mainly distributed within ephemeral semi-deserts: *Poa bulbosa, Bromus japonicus, Anisantha tectorum, Anisantha rubens, Eremopyrum orientale, Eremopyrum triticeum* and many others.

Figure 4-4: White Poplars (*Populus alba*) at both left and right hand sides of the R45.

Arboreal species are presented here by rare Tamarisk shrubs (*Tamarix Pallasii*). This species is also quite common as artificial plant along the project road. Some other species of trees can be also observed along both R45 and R46 roads. All trees at the area are artificially planted and mainly observed within villages and their vicinity. Most of the trees are located in about 8-10 m from the centerline. A lot of trees had been also observed quite close to the road (6-10 m from the centerline) but still behind the fence of private properties, behind the channels or gas or water pipes stretched in parallel to the road.

The main species along the R45 is different species of Willows (*Salix fragilis, Salix alba* and *Salix babylonica*), Poplars (*Populus alba* and *Populus*

pyramidalis), Mulberry (*Morus alba*), a few Elm (*Ulmus foliacea)*, Tamarisk (*Tamarix Pallasii*) and Blackberry (*Rubus fruticosus*) shrubs. Some different fruit trees such as Pomegranate, Quince, and Cherry etc. are growing in private gardens adjacent to the project road.

Figure 4-5: Willows (*Salix fragilis*) at LHS of R46

Different Willow trees (*Salix fragilis, Salix alba* and *Salix babylonica*) are also the predominant arboreal species for R46 – they are more than 60% among other trees and growing by long lines along the project road. White Poplar (*Populus alba*) and Mulberry (*Morus alba*) are also quite common here (about 10% each) however they growing by small groups (no more than 4-5 trees) or single trees. Some *Populus pyramidalis, Ulmus foliacea, Punica Granatum, Cupressus sp. and Pinus sp.* are also present here mainly within private properties. Tamarisk shrubs are much more distributed here comparison with R45. Few Sedge (*Carex sp.)* patches can also be observed here due to increasing of land moisture. Most of the trees are distributed within villages' vicinity. The distance of planted trees from the centerline is mainly between 12 to 20 m however in some road sections they are closer (up to 6-8 m).

4.3.2 Fauna

Typical predators of the area are jackal *Canis aureus* and red fox *Vulpes vulpes*, a resident species of this area and wolf *Canis lupus*, which follow sheep flocks to their winter pastures in the lowlands. Further characteristic mammals are the Eared Hedgehog (*Hemiehinus auritus*) quite common here during warm seasons of the year (it falling into hibernation for a winter time). Some bats - *Pipistrellus pipistrellus, P. kuhlii, Myotis mystacinus* and *Barbastella barbastella*[b2]) are also distributed here within summer time and migrating south or hibernating during winter. The hare *Lepus europaeus* and rodents *Mus muscus, Meriones erythrourus, M. vinogradovi* and *Microtus* socialis are widely distributed in the fields adjacent to the project road. African Wildcat (*Felis libyca*[a]) is extremely rare species for the area and according to some literature sources it is even not exist here anymore. Marbled Polecat (*Vormela peregusna*[a]) is quite rare as well however still observing at semi-desert steppes mainly within colonies of numerous sanderlings (shelters of the polecat is inside the burrows of this rodent). Wild boar (*Sus scrofa*) is keeping mainly reed overgrowing at Hajigabul Lake and Shirvan National Park, but quite often moving to the agricultural fields at night and returning back to the shelters at the morning. The Coypu (Myocastor coypus) is one of most typical mammals occurring in the numerous water canals.

Most characteristic resident bird species of the area are Common Kestrel (*Falco tinnunculus*), Rock Dove (*Columba livia*), Turtle Dove (*Streptopelia turtur*), Little Owl (*Athene noctua*), Hoopoe (*Upupa epops*), Crested Lark (*Galerida cristata*) and Isabelline Wheatear (*Oenanthe isabellina*). Many breeding species are also occurring in the area within summer time: Lesser Kestrel (*Falco naumanni*), European (*Merops apiaster*) and Blue-Cheeked Bee-Eaters (*Merops superciliosus*), Rufous Bushchat (*Cercotrichas galactotes*), Red-Backed *(Lanius collurio)* and Lesser Grey Shrikes *(Lanius minor),* Goldfinch *(Carduelis carduelis)* and many others. Penduline Tit (*Remiz pendulinus)* and Magpie (*Pica pica*) are especially numerous here and their nests can be observed at most of the trees alongside the project roads.

Such birds as Little White (*Egretta garzetta*) and Cattle Egrets (*Bubulcus ibis*) are also present on the study area within breeding season, but these species have their core habitats and breeding sites in different areas. A lot of other non-breeding water birds can be observed here during the whole year: Pygmy (*Phalacrocorax pygmaeus*) and Great (*Phalacrocorax carbo*) Cormorants are fishing at the channels, akhazes and Kur River or drying wings

[2] a – Species included into Azerbaijan Red Data Book

b – Species has international protection status (IUCN Red List)

c – Species has both local and international protection status

on the neighboring trees. Numerous egrets and herons (*Ixobrychus minutus, Nicticorax nycticorax, Egretta alba, Ardea cinerea* and others) are hunting on the shallow water of channels and floodings. Some small waders are occurring on the flooded fields within non-breeding seasons. Both Dalmatian (*Pelecanus crispus*[c]) and White (*P. onocrotalus*[a]) Pelicans, different common and protected species of ducks including White Headed Duck (*Oxyura leucocephala*[c]), gulls and terns are quite common along the Kur River during migration and winter season.

Figure 4-6: Dalmatian Pelicans (*Pelecanus crispus*[c]) flock over R46

Reptiles of the area are very dangerous venomous Blunt Nosed Viper *(Vipera lebetina)* that mainly active in warm seasons of the year with peak of activity in May, however can be observed during whole year; lizards – Caspian Gecko (*Cyrtopodion caspius*), Grozny Lacerta (*Lacerta strigata*), European Glass Lizard (*Pseudopodus apodus*). One of most distributed by same time both internationally and locally protected reptile species of the area is Greek Tortoise (*Testudo graeca*). This species is use to keep arid landscapes but also like to visit the grasslands and gardens for foraging. Two species of turtles (*Emys orbicularis*[b] and *Mauremys caspica*) are sharing similar habitats of water streams, marshes and ponds with Dice Snake (*Natrix tessellata*).

Most typical amphibian species for semi-desert landscape is Green Toad (*Bufo viridis*) The Common Frog (*Rana ridibunda*) is characteristic and most numerous species that can be found in the vicinity of each water body within the project area. Much rarer is Tree Frog (*Hyla savignyi*) that occurs only in canals and ponds with well developed reed-bed.

The Kur River and its tributaries are the temporary (spawning or/and migration areas) or residential habitat for most of fish species occurring within Azerbaijan. However just few of them can be found inside the channels crossed by the Project Roads: *Elox lucius, Rutilus rutilus, Alburnus charusini, Scardinius erytrophthalmus, Barbus cyri, B. capito, Cobitis caspia* etc. In the relatively small channels the local population does some fishing, but according to information obtained from local people it is not a source of regular alimentation, it is more a sportive occupation.

Tarantula (*Lycosa*), Phalanges (*Galeodes araneoides*), Scorpions (*Buthus eupeus*) and tick (*Ornithodorus*) are most common species from arthropoda on the study area. Insects are presented by Darkling Beetles (*Blaps*), a lot of locusts species (*Dociostaurus maroccanus* is especially numerous), some mantis, small mosquito (*Phlebotomus*) occurs in the burrows of sanderlings in dry area and many different gnats occurs on wetlands. Two species are from Azerbaijan Red Data Book - *Megacephalus euphraticus* (beetle), *Manduca atropos* (*Lepidoptera*).

Figure 4-7: Tree Frog (*Hyla savignyi*) at reed leaf within the channel

4.3.3 Protected Areas

There are three protected areas in surrounding of project area however neither of them is adjacent to the R45 or R46.

Shirvan National Park had been created by Presidential Decree No 1298 from July 05, 2003. Territory of the park is 54,373.5 ha and including plots of Baku (Garadag), Salyan, Shirvan and Neftchala administrative districts. Additionally 6,232.0 ha of adjacent territory is belonging to Shirvan State Nature Reserve and 4,930.ha to Bandovan Sanctuary.

The main landscape of the park is natural semi-desert steppe with wormwood (*Artemisia sp*.) edificatory and high diversity of ephemeral grasses. Tamarisk bushes are also highly developed here. The artificial lake Shorgyol (Flamingo) is located in the middle of the park occupying territory of about 4,000 ha and is important habitat for various water birds. Eastern part of the park is Caspian Sea coast with sand beaches and shallow lagoons. The main reason for this protected area creation was protection of Persian Gazelle (*Gazella subgutturosa*[c]) widely distributed within its area and species of fauna that are typical to this territory. Its functions also envision the implementation of environmental monitoring, public environmental education, as well as creating conditions for tourism and recreation.

Durovdag Mud Volcano. According to the presidential decree No 2315 from August 15, 2007, most of mud volcanoes are subject to governmental protection as nature monuments. One of protected volcanoes - Durovdag, is placed within Shirvan National Park – at its southern border. However this volcano is located in some distance from R46 (in about 9 km to the east from village Ashagi Surra) and separated by Kur River from the Project area, location of this protected area shall be taken into consideration during borrow pit selection.

Figure 4-8: Greater Flamingos (*Phoenicopterus roseus*) and different ducks at Hajigabul Lake

Another environmentally important area located approximately three kilometers north east of the northern starting point of the R45 has international conservation status as an **Important Bird Area – Hajigabul Lake**. An Important Bird Area (IBA) is an area recognized as being globally important habitat for

the conservation of bird populations. The program was developed and sites are identified by BirdLife International. These sites are small enough to be entirely conserved and differ in their character, habitat or ornithological importance from the surrounding habitat. There are 53 IBAs exiting in Azerbaijan. IBA No 41 (Hajigabul Lake and adjacent artificial fish ponds) does not have big territory, but this is one of most important site for conservation of winter habitat of such rare species as White-headed Duck. Winter number of this endangered IUCN listed bird on Hajigabul Lake can exceed 10% of the world population of this species. Same time this lake and adjacent fish-ponds are also important habitat for many other rare locally and internationally protected species.

4.3.4 Borrow Pits

There are two potential borrow areas mentioned in documents prepared previously for the ARS (Study on Prospective Construction Materials Sources and Better Regulation of River Extraction – IBRD Loan 7356AZ) that can be used for extraction of embankment materials – Kalmas and Babazanan hills.

Flora -_The study area is characterized by saltwort and ephemeral deserts and wormwood-saltwort semi-deserts with a short growing period of vegetation. Spring vegetation dominates over autumn vegetation. Saltwort vegetation is widely spread compared to wormwood. Wormwood formations are mostly developed here on the background of ephemeral grass vegetation. The biodiversity of the flora is particularly high with up to 600-729 plant species in this area. *Artemisia hanseniana* is the main edificatory for wormwood semi-deserts and *Salsola dendroides* is edificatory for saltwort deserts. The groups of two edificatory (*Artemisieto- Salsoletum nodulosae*) also play a very important role and are widely found in this zone.

The original vegetation covers formerly used both Kalmas and Babazanan borrow sites are almost completely removed. Both areas had been intensively used within previous highways (Hajigabul-Horadiz and Alat-Masalli highways) construction/rehabilitation activities and even earlier. Recently both areas had been properly reinstated and within next years landscape can be naturally recovered.

Figure 4-9: Rehabilitated Babazanan Borrow Site

The proposed sites are also under strong pressure of overgrazing as the pastoral farm is directly adjacent to the site. However, herbaceous plants such as *Euphorbia helioscopia, Veronica chamaedrys, Leontodon hispidus, Cirsium arvensis, Erodium cicutarium, Arnebia linearifolia, Sisymbrium officinadale, Ammi visnaga, Cicorium intibus, Calendula sp*. and *Papaver sp.* are still found in the vicinity of the proposed site but can be found mainly in the spring season. *Salsola sp., Eryngium planum* and *Echinops ritro* are the most typical species of the dry conditions in summer.

Higher incidence of *Tamarix ramosissima* or *Poa bulbosa* indicates areas with increasingly dry conditions. *Halocnemum strobilaceum* and *Halostachys caspia* develop on especially salty soils (as in the vicinity of the Babazanan site). The main seasons of ephemeral vegetation are spring and autumn with spring vegetation dominating over autumn. The quiescent period of ephemers and ephemeroids coincides with the driest season of the year. The woody-shrubby vegetation is represented here by solitary fig trees, a few tamarisk shrubs, pomegranate, junipers etc. mainly developed within canyons of temporary water streams and forms less than 5% of all flora of the area, 95% are annual and perennial grasses.

Fauna - The Tarantula *(Lycosa),* Phalanges *(Galeodes araneoides),* Scorpions *(Buthus eupeus)* and tick (*Ornithodorus*) are the most common species of arthropoda in the potential borrow areas. Insects are presented by Darkling Beetles (Blaps), locust species (*Dociostaurus maroccanus* is especially numerous), some mantis, small mosquito (*Phlebotomus*) in the burrows of Sanderlings in the dry areas and gnats in the wetlands. Two species are from

Azerbaijan Red Data Book - *Megacephalus euphraticus* (beetle), *Manduca atropos* (*Lepidoptera*).

Both areas being very dry do not contain very diverse habitats. Amphibians present include mostly Green Toad (*Bufo viridis*), which can live in dry habitats and Common Frog (*Rana ridibunda*) – that can be observed in wet canyons (at Kalmas), numerous canals and fish ponds (surrounding Babazanan). Amphibians can usually be found all year round, but especially between March and November.

Figure 4-10: Rehabilitated Kalmas Borrow Site

One of the most typical species of the area is Greek Tortoise (*Testudo greca*) (IUCN Red List and Azerbaijan Red Data Book), which is one of the most characteristic animals of semi-desert dry lands. Many other reptile species occur in this type of landscape – lizards (*Eremias arguta, Eumeces scheideri, Cyrtopodion caspius* etc.) and snakes (*Elaphe quatourlineata, Eirenis collaris, Malpolon monspessulanus, Vipera lebetina* etc.). European Pond Turtle (*Emys orbicularis*) form IUCN Red List, Caspian Turtle (*Mauremy caspia)* and Grass-snake (*Natrix tessellata*) occur in both artificial and natural water bodies adjacent to the proposed Babazanan site.

Most *Sauria* and *Criptodira* reptiles can be found between March and October-November (depending upon temperature). *Serpentes* are usually present between the end of March and October. The exception is *Vipera lebetina*, which is usually found all year round.

There are important bird migratory pathways in the area. Many different species of grebes, cormorants, herons, swans, geese, ducks, raptors, waders, gulls, terns and passerines migrate from the end of August until the middle of

December (autumn migration) and from the middle of February until middle of May (spring migration). Approximately 300 species of birds have been identified within study areas within the two migration periods. Many of them are included in IUCN Red List and in Azerbaijan Red Data Book (AzRDB) – Pygmy Cormorant, Dalmatian Pelican, Lesser White-fronted Goose, White-headed Duck, White-tailed Eagle, Corncrake, Little Bustard, Sociable Plover and many others.

Typical breeding birds for both hills include semi-desert species such as Lesser Kestrel, Chukar, Quail, Stone Curlew, Greater Sandplover, Black-bellied Sandgrouse (AzRDB), Rock Dove, Little Owl, European and Blue-Cheeked Bee-eater, Hoopoe, Crested Lark, House Martin, Swallow, Isabellina Wheatear, Rose-Colored Starling, Goldfinch etc. In the wintertime some of birds can concentrate in high number on the water surface of Hajigabul Lake (near the Kalmas) and in a little number on Duzdag Lake (near Babazanan) and other small water ponds. These are – Great Crested Grebe, Black-necked Grebe, Dalmatian Pelican (IUCN, AzRDB), Pygmy Cormorant (IUCN), Great White Egret, Mute Swan (AzRDB), Greylag, Lesser Whitefront Goose (IUCN), Shelduck, Mallard, Wigeon, Teal, Red-crested Pochard, Tufted Duck, Pochard, White-headed Duck (IUCN), Coot, Yellow-legged Gull, Great Black-headed Gull, Common Gull, Little Gull etc.

The most typical mammal species include *Rattus norvegicus, Mus musculus, Meriones erythrourus, Pipistrellus kuhli and Vulpes vulpes*. The *Oryctolagus cuniculus, Sciurus vulgaris and Pipistrellus kuhli* are typical human species. *Hemiechinus auritus, Pipistrellus pipistrellus, Microtus socialis*, *Canis aureus, Mustela nivalis, Lepus europaeus* are also quite common here. *Canis lupus* is a typical winter visitor of the area – it migrates to lowland winter pastures together with numerous flocks of sheep. One of the most important species for Babazan borrow site is Persian Gazelle (*Gazella subgutturosa*[c]). This species is the endemic animal for the country and main population is concentrated inside Shirvan National Park which is neighboring with Babazanan at northern edge. Gazelles are use to regularly visit Babazanan.

4.4 SOCIO-ECONOMIC RESOURCES

4.4.1 Infrastructure

Azerbaijan inherited a relatively extensive water supply system from the Former Soviet Union (FSU). About 95 percent of the population in Baku and about 83 percent of those living in secondary cities and small towns are connected to piped water, but the quality of infrastructure and services has deteriorated severely since independence, due to a lack of investment and deferred maintenance. In many secondary and small towns, water treatment facilities are largely dysfunctional or lacking completely, leaving the

population in these towns without access to safe water. In addition, almost everywhere in the country, the piped water supply is unreliable and often available fewer than 12 hours per day. Centralized piped water supply systems are rare in rural areas, where less than 33 percent of the population has access to a piped water supply.[3]

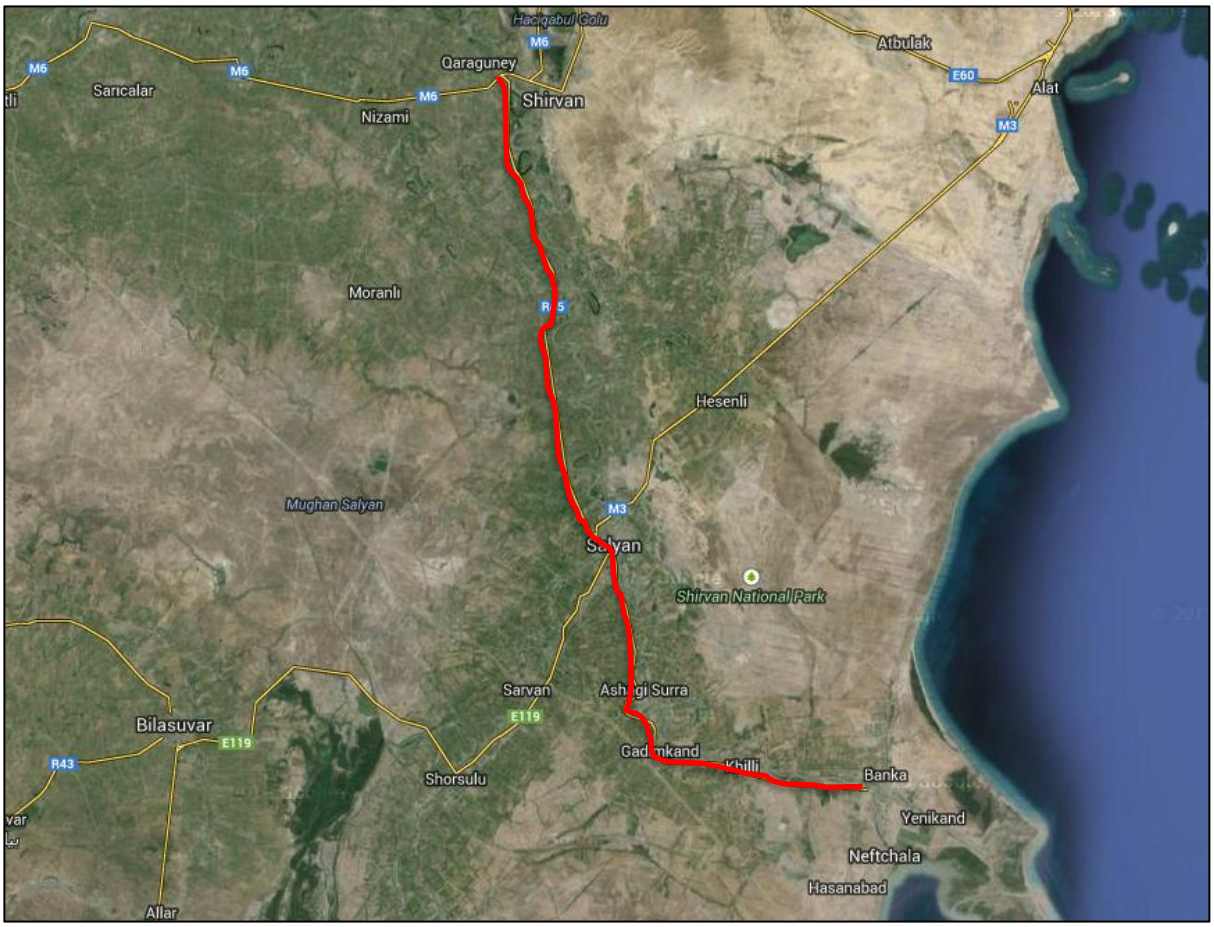
The villages within the Project corridor are served by mains electricity and mains gas and some to piped water systems. Many of the connecting utilities are located adjacent to the road sides, such as gas pipes and electricity transmission towers. Careful consideration needs to be applied to these utilities during the design and construction phases of the Project to minimize disruption to these utilities, especially in winter months. Other infrastructure in the Project area includes irrigation channels and a railway line. It is unlikely that there will be any impacts to the railway line, unless local roads are proposed that cross the line. As with utilities, design and construction activities should be coordinated with users of irrigation waters to ensure minimal disruption.

4.4.2 Land Use

The predominant land use in the Project Corridor is agricultural. **Figure 4-11** illustrates how the Kur and its associated irrigation channels feed the farmland adjacent to many sections of the Projects Roads. No industrial land uses were noted within the Project Corridor with the exception of the oil fields close to Neftchala. Commercial activities were noted including Sturgeon breeding, again within Neftchala Rayon. Villages within the Project corridor comprised no buildings of architectural or historical importance.

Figure 4-11: Indication of Agricultural land use in the Project Corridor.

[3] World Bank Group – Azerbaijan Program Snapshot, 2013



4.4.3 Waste Management

Waste management in Azerbaijan has considerable scope for improvement. There is no separation of waste or collection/treatment of household waste such as lead acid batteries, mercury-containing thermometers, household chemicals, paints and pesticides. Much waste is dumped on land by the roadside, along riverbanks, and on land adjacent to towns and villages. Waste management in the Project Area is particularly poor, large swathes of garbage were observed dumped by locals villagers in ditches adjacent to both Project roads (see **Figure 4-12**). In turn this behavior is leading to pollution of water ways and groundwater.

Figure 4-12: Waste Dumped in Drainage Ditches.

4.4.4 Population

The road corridor is located in Salyan, Neftchala and Sabiribad administrative districts (Rayons). The main centre of population is Salyan City. Salyan itself lies within two bends of the Kur River, south of the study area. **Table 4-3** provides a summary of the most recent population data for the Project Rayons.

Table 4-3: Population of Project Rayons

Rayon	Population	2013	
	Urban	Rural	Total
Sabiribad	29.2	132.7	161.9
Neftchala	39.3	43.9	82.2
Salyan	41.7	86.4	128.1

Numerous small villages and settlements line the Project corridor. Section 3 (**Table 3-1**) provides further details of the names and locations of these settlements.

4.4.5 Socio-economic Issues

General - Azerbaijan is a lower middle-income country with a gross national income per capita of $3,660 in 2008. Mineral resources, mainly oil and gas, contribute approximately to one half of GDP. Agriculture contributes at about 6 percent to GDP but it provides livelihoods to almost half of all households. The country has fertile agricultural land and a well-educated labor force.

In the last five years, GDP has grown at an average annual rate of 15 percent – which is attributable mainly to oil and gas production. However, oil production is expected to peak in 2011 and decline after that if no major new discoveries are made. For this reason, diversified development of the non-oil sector is critical for generating jobs and promoting long-term growth.

The Project falls in Aran region of the country where the level of poverty is estimated to be 5.6 percent. The project is expected to link three Rayons of the country i.e. Sabirabad, Salyan and Neftchala. The main occupation of this region is agriculture and is concentrated on subsistence farming. Main crops grown are cotton, grains and vegetables. Apart from agriculture, cattle-breeding and fisheries are two main other sources of livelihoods. Share of total agriculture output in the four Rayons accounts for 6.3 percent of total agriculture output of the country. Significantly, the share of industry output in these areas consists of only 1.1 percent of total industry output of the country (**Table 4-4**).

Table 4-4: Main Economic Indicators of the Region, 2012

	Number of registered employees in economy	Industry output	Agriculture output	Retail trade turnover	Investment to fixed assets
	in '000	*in min. Manat unless otherwise indicated*			
Total Country	**1480.7**	**34565.0**	**4844.6**	**17559.1**	**15407.2**
Baku	661.3	30877	27.5	8809.4	9502.3
Aran Region, total, o/w	215	821.5	1435.5	2570.0	1219.6
Neftchala	9.6	27.1	64.0	116.0	17.1
Salyan	16.1	53.5	88.3	128.5	97.2
Sabirabad	14.4	4.6	150.6	157.7	107.0

	share in %				
Total Country	100.0	100.0	100.0	100.0	100.0
Baku	44.7	89.3	0.6	50.2	61.7
Aran Region, total, o/w	14.5	2.4	29.6	14.6	7.9
Neftchala	0.6	0.1	1.3	0.7	0.1
Salyan	1.1	0.2	1.8	0.7	0.6
Sabirabad	1.0	0.0	3.1	0.9	0.7

Source: World Bank Group – Azerbaijan Program Snapshot, 2013 and AzSTAT

Table 4-5 provides an overview of average wages in the relevant Rayons and how they have risen significantly since 2000.

Table 4-5: Average monthly nominal wages (in Manat) and salaries of employees by economic regions

	2000	2005	2007	2008	2009	2010	2011	2012
Republic of Azerbaijan	**44.3**	**123.6**	**215.8**	**274.4**	**298.0**	**331.5**	**364.2**	**398.4**
Baku city (with settlements)	**60.0**	**194.1**	**322.8**	**396.5**	**429.8**	**474.8**	**517.2**	**566.5**
Aran economic region	**28.4**	**76.1**	**138.0**	**178.2**	**191.5**	**213.5**	**234.1**	**243.7**
Neftchala	42.7	79.4	144.8	183.0	197.8	209.0	239.5	242.8
Bilasuvar	26.5	66.3	127.8	170.1	188.7	203.7	237.6	249.7
Salyan	32.2	92.4	147.9	181.1	192.5	216.0	231.9	250.8
Sabirabad	24.0	75.3	134.7	172.0	190.4	223.6	240.0	242.4
Hajigabul	27.9	71.2	131.1	181.7	197.5	218.3	255.2	255.3
Shirvan city	43.2	145.7	247.2	298.0	290.5	304.7	337.2	384.4

Salayan District Profile - The district belongs to Aran Economic Region. The economic region's main natural resources are oil, natural gas, iodine and bromide groundwater as well as aggregates and construction materials. Power generation, chemical manufacturing and machinery production are vital economic activities. Its light industries are essentially agriculture-based with cotton, grain, fruit and vegetables, fisheries, dairy and meat as the major products; over 90% of the country's cotton is produced in this region.

Agriculture production particularly in Salyan and the adjacent Neftchala district is highly dependent on an elaborate irrigation-drainage system. With the collapse of the Soviet Union and the withdrawal of state subsidy, a

number of irrigation facilities were left in a state of disrepair due to lack of funds. State lands have been privatised and parcelled. A great proportion of the irrigation system now requires rehabilitation and maintenance. Only recently has the agricultural sector begun to revive with the government's efforts to rehabilitate the irrigation system and the provision of more investment for the agricultural system.

The basis of the economy of the district is agriculture specialised on grain, potato, vegetables, fruit and grapes and to some extent cotton production. Many farmers previously involved in cotton production have shifted to grain cultivation and rearing livestock: cattle, sheep and poultry. There are state agricultural enterprises, 86 private and 261 individual farms.

Currently, agricultural land is devoted to cultivation of alfalfa and pasture (80%), cotton (10%) and cereals (10%). Vineyards and vegetable cultivation are primarily backyard activities with produce either consumed directly for subsistence and/or sold at roadsides or local markets.

In addition to agriculture, there are some processing and manufacturing activities including cotton ginning and plastic production. There is an oil and gas production unit in Salyan district.

In all centres of population and along the existing road, a variety of businesses have been established ranging from temporary sales points for fruit, vegetables, fish and 'ayran' (a yogurt- based drink), shacks selling vehicle lubricants through open-air restaurants to more 'permanent' bakeries, tea shops, restaurants, general stores, supermarkets, petrol stations, vehicle repair yards and construction materials yards.

Neftchala District Profile - Neftchala district's main economic activities are chemical production – although none are located within the immediate vicinity of the Project corridor. The district has large reserves of iodine- and bromine-bearing waters as well as oil and gas. Agricultural activities are quite limited due to not only the soil conditions but also the condition of the irrigation and drainage system. The fishery sector is highly developed with increasing investment in hatchery and nursery operation for sturgeon breeding.

Sabiribad District Profile - Sabirabad's economy is based on agriculture with cereals, various types of root crops, livestock, and poultry as the major products, along with highly developed animal breeding.

4.4.6 Health & Safety

Current traffic volumes within the Project Corridor are very low, as such accidents rates are assumed to be low. Only one hospital was noted within the Project area, at Km 1.2 of the R46.

Life expectancy in Azerbaijan was not far behind that of Western Europe in the 1970s, but since that time, it has improved only slightly and is now falling behind. Responsibility for declining life expectancy falls largely on the high levels of non-communicable diseases (cardiovascular and malignant neoplasms), which international experience suggests will require increased and better quality medical care. There are now fewer than 40 maternal deaths per year. Infant mortality has declined since 2000, although more recently, the trend has been more flat.[4] **Table 4.6** provides an indicator of infant mortality rates in the Project Rayons.

Table 4-6: Infant mortality under 1 year by economic and administrative regions and towns of the Republic of Azerbaijan in 2012[1)]

Economic and administrative regions and towns	Total	*including:*			
		urban places	rural places	boys	girls
Azerbaijan Republic	**1884**	**1524**	**360**	**1035**	**849**
Baku city - total	**784**	**784**	**-**	**431**	**353**
Aran economic region - total	**310**	**188**	**122**	**170**	**140**
Neftchala region	15	8	7	8	7
Bilasuvar region	21	12	9	12	9
Salyan region	17	9	8	9	8
Sabirabad region	15	8	7	8	7
Hajigabul region	7	4	3	4	3
t.d. of Shirvan town	15	15	-	8	7

[1)] Based on data of the Ministry Healthcare

4.4.7 Educational Facilities

The desire of Azerbaijan to move up the ranks of upper-middle income countries has intensified the urgency for sustainable, long term reforms in the country's education system. Primary enrollments are comparable to the level of high income countries and indicate wide access to basic education. However, enrollments in preschool and higher education still remain low. In addition, the quality of educational outcomes at all levels shows scope for improvement. [5]

[4] World Bank Group – Azerbaijan Program Snapshot, 2013

[5] World Bank Group – Azerbaijan Program Snapshot, 2013

Several schools were noted within 200 meters of the centerline of the Project corridor. **Table 4-1** lists the schools locations and distances from the centerline. Given that all of the schools identified were located within urban areas, where speed limits are set at 50 kilometers per hour, noise impacts to these sensitive receptors will be minimal. However, increased traffic volumes may result in increased accidents between vehicles and school children if designs do not take into account basic safety requirements such as sidewalks and pedestrian crossings in the vicinity of schools.

4.4.8 Cultural Heritage

In general, there are few culturally important structures and sites within the study area. Archways and monuments have been constructed at entrances to some settlements and at the district borders (see **Figure 4-13**). Monuments in the form of drinking water points are provided at several locations along the existing road. War memorials were also observed within the vicinity of the road, but not close enough to be impacted by Project works.

Figure 4-13: Monument indicating border with Neftchela Rayon.

4.4.9 Noise

Noise is often explained as sound that is unwanted by the listener. Sound is a wave motion carried by air particles between the source and the receiver, usually the ear. Sound, pressure and noise are measured in units of decibel

(dB) using a logarithmic scale. If a sound is increased by 10 dB, it is perceived as a doubling in loudness. Changes in a sound by 3 dB(A) is barely perceptible to the human ear.

Noise standards in Azerbaijan for different areas and times of day are those issued by the Russian Federation (e.g. Sanitary Norm CH2.2.4/2.1.8.562-96, Moscow, 1997). The maximum allowable noise level standards are shown in **Table 2-3**. The recommended value for ambient daytime noise levels in residential areas is 60 dB(A).

Given the current low-moderate level of road traffic and general lack of industrial activity within the Project Corridor, noise is not considered to be a key environmental issue in the Project area at present. Sensitive noise receptors[6] in the study area provided by **Table 4-7** below.

Table 4-7: Sensitive Noise Receptors (R45 & R46)

#	Type	Location (km)	Approximate Distance from Centerline (m)
R45			
1	School	4.0	50
2	Mosque	8.4	45
3	Mosque	11.6	40
4	School	15.2	50
R46			
5	Hospital	1.2	40
6	School	3.1	40

[6] Sensitive noise receptors are classified as schools, hospitals, places of worship, etc.

7	School	12.7	40
8	School	19.9	40
9	Mosque	20.8	50
10	School	21.4	50
11	School	25.4	40
12	School	29.0	200

5. ENVIRONMENTAL AND SOCIAL IMPACTS

5.1 GENERAL

According to the Terms of Reference, this portion of the report shall:

"*determine and quantify where possible the significant positive and negative impacts, direct and indirect impacts, and immediate and long-term impacts associated with the project and any alternate design options. Identify those that are unavoidable or irreversible. Identify mitigation measures and explore opportunities for environmental enhancement. State the basis for selection of the proposed design, and make specific recommendations to be incorporated by the final engineering design.*"

Accordingly, this section of the report discusses the environmental and social impacts within the Project corridors of the R45 & R46 Roads and Local Roads and proposes appropriate mitigation measures.

The proposed rehabilitation of the Project Roads has been classified as a Category B project based on the World Bank's Operational Policy 4.01. Accordingly, it is anticipated that the impacts on human population or environmentally important areas are less adverse, site specific, with very minimal irreversible impact and that the measures redesigned more readily than Category A projects. Most of the impacts are directly related to the construction period of the project road. To minimize any adverse impact, it was decided that the alignment of the proposed rehabilitation would coincide with the existing alignment subject to the engineering guidelines and criteria in the design.

The primary disturbance along the road corridor will entail generally earthworks such as roadside embankment stabilization, pavement, and bridge construction and drainage works installation. Minor work will entail installation of guard rails and other necessary road furniture. It is expected that noise level and dust particulate concentrations in the air will be elevated.

5.2 IMPACT PHASES

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

- Design – This is the period of the detailed design.
- Pre-construction Phase – this period is the time that the 'Notice to Proceed' is given to the Contractor until commencement of construction.

- Construction Phase - the period from the completion of the Pre-construction activities time until the issuing of the 'Certificate of Completion'.
- Operation and Maintenance Phase – This final period is the time from completion of works.

The key feature of the three Project activities that mitigate the overall adverse impact is the fact that all Projects will be confined within the existing road alignment.

5.3 TYPE OF IMPACTS

Potential impacts from projects such as road improvement projects may be classified as:

Direct Impacts - i.e., those directly due to the project itself such as the conversion of land previously used for agricultural purposes to transport use. Direct impacts also include the impact of construction expenditures in the local economy.

Indirect Impacts – i.e., those resulting from activities prompted by the project, but not directly attributable to it. The use of rock for the improved roadbeds, for example, has an indirect impact of increasing the demand for crushed rock and increased borrow operations.

Cumulative Impacts – i.e., impacts in conjunction with other activities. A single road improvement may not exert a significant environmental impact, but if several roads comprising a network are developed in the same area, or are combined with agricultural reform programs in the same general area, the cumulative or additive effect could be large.

Impacts in all three categories may be either:

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

Long-term – i.e., road impacts that could, for example, affect regional land use and development patterns and regional hydrology and flooding if roads are poorly designed. Long-term negative impacts can also result from the loss of agricultural land to other land uses; air and water pollution; problems associated with scattered borrow pits; and haphazard growth.

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

5.4 SUMMARY OF IMPACTS

Table 5-1 provides a summary of the potential Project impacts that are discussed in detail under **Sections 5-4** to **5-7**.

Table 5-1: Summary Impact Table

	Physical Characteristic						Biological Characteristic			Socio-economic Characteristic									
	Geology	Topography	Soils	Climate and Air Quality	Hydrology	Natural Hazards	Flora	Fauna	Protected Areas	Infrastructure	Land Use	Waste Management	Population	Community Structure	Socio-economic	Public Health & Safety	Educational Facilities	Cultural Heritage	Noise
Alignment Changes			D/L		D/S		D/S			D/S	D/L					D/L		D/S	D/L
Road Structure (width, etc)												D/S							
Noise Barriers							D/S									D/L	D/L		D/L
Wildlife Crossings	D/S		D/S					D/L				D/S							D/S
Land Acquisition											D/L				D\L				
Borrow Pits	D/L	D/L	D/L	D/L			D/L									D/L			D/L
Asphalt Plants			D/L	D/L	D/S		D/S					D/L				D/L			D/L
Construction Camp			D/L	D/L	D/S		D/S					D/L			D/L	D/L			D/L
Storage Areas			D/L	D/L	D/S		D/S					D/L				D/L			D/L

Haul Routes			D/L	D/L						D/L						D/L	D/L		D/L
Site Clearance			D/L		D/L		D/L	D/L			D/L	D/S							D/S
	Physical Characteristic						**Biological Characteristic**			**Socio-economic Characteristic**									
	Geology	Topography	Soils	Climate and Air Quality	Hydrology	Natural Hazards	Flora	Fauna	Protected Areas	Infrastructure	Land Use	Waste Management	Population	Community Structure	Socio-economic	Public Health & Safety	Educational Facilities	Cultural Heritage	Noise
Pavement construction		D/S	D/S	D/S	D/S		D/S			D/S		D/S				D/S	D/S		D/S
Bridge construction			D/S	D/S	D/L		D/L	D/L				D/S				D/S			D/S
Culverts			D/S	D/S	D/L			D/S				D/S				D/S			D/S
Earthworks	D/L	D/L	D/S	D/S	D/S		D/S	D/S		D/S	D/S	D/S				D/S			D/S
Removal of Trees			D/L		D/L		D/L	D/L			D/L				D/S				
Relocation of Services										D/L	D/L		D/L	D/L	D/L				
Increased traffic				D/L											D/L	D/L	D/L		D/L
Road Maintenance			D/S	D/S	D/S							D/S				D/S			D/S

D = Direct Impact	S = Short-term Impact	L= Long term Impact		Potential Positive Impact		Potential Low/Medium Impact		Potential High Impact

5.5 IMPACTS TO PHYSICAL RESOURCES

5.5.1 Geology & Soils

The main direct and permanent impacts on geology and soils will occur during the construction phase. These impacts relate to permanent loss of agricultural land, removal of topsoil during site clearance, extraction of materials for road construction, physical works such as embankment construction, and disposal of surplus/unsuitable for reuse within the works.

5.5.1.1 Potential Impacts

The decision to restrict the Project works to within the existing RoW and carriageway, will keep soils related construction impacts to a minimum. Potential impacts to this component may however include:

- Loss of Soil for Grazing and Agricultural Production – As the project involves reconstruction and rehabilitation of an established road, the Project impact on the land acquisition is reduced to a minimum. However, the Designer shall prepare geometric design of the road in such a way that no land acquisition in addition to that included in the LARP is required in consequence of the design.
- Soil Compaction – Use of heavy plant equipment can lead to soil compaction.
- Erosion - Certain types of road improvements (e.g., road widening) result increased runoff and/or increased velocities could lead to additional soil loss. In this instance, however, virtually all rehabilitation activities will be confined to the existing RoW and no significant increase in the amount of impervious surfaces and/or the quantity or velocity of runoff is anticipated.
- Borrow Pits – Certain volume of materials will be obtained from borrow areas and will be used for fill, capping layer and granular sub-base. Several potential borrow areas have been identified which can be used for the project road (see **Section 4).** The prospective Contractor will probably identify his source of materials. However, the materials need to be approved by the CSC prior to using them for the project road. Potential impacts relating to borrow pits are discussed under Item **5.5.4 – Borrow Pits**.
- Induced Changes - Induced changes in the Project Area leading to industrial and commercial development are conceivable, thereby decreasing soil availability for agricultural purposes. However, given the traditionally strong agricultural sector in this region significant induced changes are considered unlikely.
- Contamination Due to Spills or Hazardous Materials - Potential soil contamination is a possibility resulting from poorly managed fuels, oils and other hazardous liquids used during the project works.

5.5.1.2 Mitigation Measures

Mitigation related to the potential soil-related impacts is recommended as follows:

Pre-construction Phase

- Loss of Soil for Agricultural Production. Before the commencement of the construction works of the Project at any road, the ARS must prepare the Land Acquisition and Resettlement Plan (the LARP), obtain the approval of the World Bank and then implement the plan and acquire the land. The LARP will be processed by the ARS and World Bank during the Contractor bidding period, and it does not require any action of the Contractor. It will be approved and implemented before the Contractor commences work. In addition, construction camps, staging areas and temporary storage, shall not be located on agricultural or private lands without the express permission of the landowner.
- Borrow Pits – Mitigation relating to borrow pits is discussed under **Item 5.5.4** – Borrow Pits.

In addition to the above, the Contractors for all Project roads will be responsible for preparation of an Emergency Response Plan (ERP) which will cover containment of hazardous materials, oil spills, and work-site accidents. The plan will detail the process for handling, and subsequently reporting, emergencies, and specify the organizational structure (including responsibilities of nominated personnel). The plan will be submitted to the CSC for approval. Implementation of the plan will be monitored by the CSC. Any emergencies, and how they were handled, will be reported in monthly progress reports by the Contractor to the CSC & ARS PIU.

Construction Phase

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

- Erosion - During construction, the Contractor will be responsible for ensuing material that is less susceptible to erosion will be selected for placement around bridges and culverts. In addition he shall ensure re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local grasses and shrubs; (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth. The CSC and the Contractor will both be responsible for ensuing that embankments are monitored continuously during construction for signs of erosion.
- Soil Compaction - The contractor should endeavor to confine operation of

heavy equipment within the RoW, as much as possible, to avoid soil compaction and damage to privately owned land. If in case private lands are disturbed, the contractor should promptly inform the owner and agree on the ways to remedy the situation.

- Borrow Pits – Mitigation relating to borrow pits is discussed under **Item 5.5.4 – Borrow Pits**.
- Conversion of Agricultural Soils Due to Indirect/Induced Impacts. Although the EMP contains provisions controlling direct impacts of land takings for both the road and ancillary functions (asphalt plants, construction camps, etc.), control of the induced impacts is largely beyond the scope of the Project.
- Contamination Due to Spills or Hazardous Materials. The Contractor, with oversight from the CSC, shall ensure that:
  - All fuel and chemical storage (if any) shall be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.
  - The construction camp maintenance yard shall be constructed on impervious hard standing with adequate drainage to collect spills, there shall be no vehicle maintenance activities on open ground.
  - Filling and refueling shall be strictly controlled and subject to formal procedures. Drip pans shall be placed under all filling and fueling areas. Waste oils shall be stored and disposed of by a licensed contractor.
  - All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.
  - The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any soils.
  - No bitumen drums or containers, full or used, shall be stored on open ground. They shall only be stored on impervious hard standing.
  - Areas using bitumen shall be constructed on impervious hard standing to prevent seepage of oils into the soils.

5.5.2 Topography

5.5.2.1 Potential Impacts to Topography

All Phases - The Project location of both the R45 and R46 roads in this instance has been determined by the existing RoW to be rehabilitated. No significant alteration in realignment is included in the Project with the exception of the minor alterations to curves due to the requirements of safety specifications. Due to the flat nature of all Projects roads no cut and fill activities will occur

and no blasting will be required. Accordingly, potential impacts to topography will be limited to borrow pits.

5.5.3 Climate and Air Quality

5.5.3.1 Potential Air Quality Impacts

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

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

Construction Phase - During construction, air quality is likely to be degraded by a range of operational activities including:

- Exhaust emissions from the operation of construction machinery and the combustion of fuel for furnaces and boilers;
- Open burning of waste materials;
- Dust generated from quarries, borrow pits, haul roads, unpaved roads, exposed soils and material stock-piles. The dust may settle on productive crops, and may cause some degree of respiratory stress for nearby residents.

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

- Inconvenience to local people. For example, people may have to re-wash laundry that has been put outdoors to dry, and wash windows, curtains and vehicles. Dust can contaminate meat hanging up in open-air butchers and other food that is exposed to it in homes, shops and open-air restaurants, giving food a gritty texture.
- Health and safety problems. Dust may affect health by irritating eyes and worsening the health of people with asthma. Dust can reduce visibility for drivers on roads. It can also be blown for long distances by the wind.
- Crop damage. Even low concentrations of dust can affect plant and fruit growth as far away as one kilometer from a construction site. Plant growth is particularly susceptible to dusts that are highly alkaline, for example limestone and cement dust. Dust deposited during light rainfall can cause the soil surface to form a crust increasing run-off.

- Impact on ecology. Dust blowing onto watercourses may damage ecology by increasing sedimentation, reducing sunlight and suffocating fish. It may also affect plant growth and change the species of plants growing in an area. Dust may also damage trees and other vegetation planted as part of the construction contract.
- Damage to plant and equipment. Within the construction site, dust can cause mechanical or electrical problems in sensitive equipment such as computers. It can also increase abrasion of moving parts in equipment and clogging of air filters.

Operational Phase - The main source of air pollution during the operational phase will be vehicles moving on the highway. The main pollutants are:

- Carbon monoxide (CO),
- Nitrogen oxides (NOx),
- Hydrocarbons (HC),
- Sulphur dioxide (SO_2),
- Lead (Pb),
- Carbon dioxide (CO_2),
- Ozone (O_3),
- Polycyclic aromatic hydrocarbons (PAH),
- Particulate matter (PM) and
- Trace metals.

Some of these compounds can damage health and/or the environment. The concentration of pollutants generated by vehicles depends on factors such as the number, type and speed of vehicles. The effect of air pollution on local people depends on the distance between them and the road, wind direction, topography and other factors. The main direct effects are in the area closest to the road as the rapid dispersion and dilution of exhaust gases quickly reduces their concentrations to levels at which risks are minimal.

Given the relatively low population levels within Project corridors, it is unlikely that increased traffic volumes will have significant impacts to residents health in terms of NOx, CO and VOC pollution. In addition, once completed, current high levels of Particulate Matter (PM) in areas where the road condition is poor will be substantially reduced. Improved vehicle performance on a new better road surface will also serve to alleviate potential air pollution levels to a modest degree.

5.5.3.2 Potential Climate Change Impacts

Any increase in emissions from vehicles operating on the rehabilitated roads is unlikely to be a significant contributor to CO_2 emissions in the region. For example, an average car travelling 40 kilometers may emit around five kilos of CO_2. If we assume that 5,000 vehicles use each road per day (10,000 in total for the Project Corridor), then 50 tonnes of CO_2 will be produced per day, or 18,250 tonnes per annum. A single transatlantic journey in a 747 emits approximately 500 tonnes of CO_2. Accordingly, emissions from vehicle traffic within the Project corridor are the equivalent of 18 return flights across the Atlantic, or around 0.0004% of Azerbaijans total CO_2 emissions in 2010[7]. It is possible that climate change could however impact upon the Project Corridor, primarily via increased flood events.

5.5.3.3 Air Quality Mitigation

Design and Pre-construction Phase - Locations for borrow pits, rock crushing facilities and asphalt plants shall require approval from the CSC, ARS PIU and MENR during the Pre-construction phase. Efforts should be made to ensure that these facilities are as near to the Project road as practical to avoid unnecessary journeys and potential dust issues from vehicle movements during construction works. In addition, no asphalt plant shall be located within 500 meters of any urban area, protected area or sensitive receptor. The locations of these facilities shall be indicated within the Contractors CEMP. Baseline air quality monitoring shall also be undertaken by the Contractor as described below under recommended monitoring.

To adequately manage air quality impacts the Contractor shall be responsible for the preparation of an Air Quality Plan, submitted to the CSC as part of the CEMP. The plan will detail the action to be taken to minimize dust generation (e.g. spraying un-surfaced roads with water, covering stock-piles, etc) and will identify the type, age and standard of equipment to be used and will also provide details of the air quality monitoring program for baseline and routine monitoring. The Plan shall also include contingencies for the accidental release of toxic air pollutants.

Construction Phase - The Contractor shall be responsible, through compliance with this EMP and his CEMP, for the following;

- *Exhaust emissions* - No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the CSC. Construction equipment shall be maintained

[7] http://data.worldbank.org/indicator/EN.ATM.CO2E.KT/countries/AZ?display=graph

to a good standard and fitted with pollution control devices regularly monitored by the Contractor and CSC.

- *Open burning of waste materials* - No burning of debris or other materials will occur on the Site without permission of the CSC.
- *Dust generated from haul roads, unpaved roads, material stock piles, etc* - The Contractor shall ensure and that material stockpiles shall be located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne. All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s). Hard surfaces will be required in construction areas with regular movements of vehicles. Effective use of water sprays will be implemented (e.g., all roads within the construction areas of the Site shall be sprayed at least twice each day during days of no rainfall, and more if necessary to control dust to the satisfaction of the CSC).

In addition, any new borrow pits and asphalt mixing plant shall be the subject of separate environmental application under the responsibility of the Contractor (see **Section 2** for legal requirements). The CSC shall ensure that no such facility becomes operational without the required permits.

Finally, the Contractors are responsible for the preparation of a Health and Safety Plan. The Plan, required as part of the CEMP, shall include contingencies for the accidental release of toxic air pollutants.

5.5.4.4 Climate Change Mitigation

It is recommended that during the design phase, the Designers consider the potential for current and future flood events within the Project area and establish an appropriate embankment height and drainage measures to account for potentially more regular and more intense flood events.

5.5.5 Hydrology

5.5.5.1 Potential Hydrological Impacts

Design Phase Impacts - The following potential impacts to hydrological conditions exist:

- Drainage & Flooding - Inadequate assessment of the hydrological conditions in the Project Area and poor design could result in the failure of some of the Project structures. This in turn would result in several impacts including cost to rebuild the structures, potential flooding of valuable agricultural lands and impacts to surface water quality.

- Construction Camps – Improper siting and design of construction camps at both roads can have negative impacts to hydrology, both surface (wetlands) and groundwater, through improper disposal of liquid waste and spills of hazardous liquids.
- Borrow Pits – No river bed borrow pits have been identified so far for use during construction. However, it is possible that the Contractor could use river bed materials from an alternative source not discussed within this report. Hydraulic impacts resulting from extraction of river bed materials may include:
    - Channel modifications such as widening or deepening the channel, creation of deep pools, loss of riffles, alteration of bedload, alteration of channel flow, and degraded aesthetics;
    - Upstream and downstream erosion, and related impacts to bridges and other infrastructure whose foundations may be undermined by the lowering of the riverbed.

Construction Phase Impacts - The following potential impacts to hydrological conditions exist:

- Kur River & Welands – Given that the Kur River flows within 50 meters of the Project roads in some sections and that numerous wetlands are located within 200 meters of the roads, it is possible that the river and the wetlands could be subject to contamination from dumped waste materials by the Contractor. Contamination for spills or leaks into channels that feed the Kur may also cause impacts to the river. Water will also be abstracted from the river for use during the construction phase, however given the high discharge of the river (average 443 m^3/s) any potential abstraction is unlikely to have significant impacts to the flow of the River.
- Construction Camps and Storage Areas – Impacts during the construction phase can result from the discharge of wastes to surface water from construction camps, the poor management of sanitary waste and accidental spills of hazardous liquids.
- Drainage and Flooding - Road construction can increase the amount of impervious surface and design decisions in regard to increased runoff could adversely impact the area drainage. Inadequate culverts or other cross drainage structures could fail to allow floodwaters to equilibrate and pass freely and to avoid prolonging flood periods and by heightening the flood levels on the upstream side of the roads.

5.5.5.2 Hydrological Mitigation

Potential adverse impacts in the Project Area will be avoided or otherwise mitigated by ensuring the Contractors comply with the following:

Design Phase

- Drainage and Flooding - Consideration in the design phase will be given to the issue of drainage and culverts to ensure that drainage patterns are improved from the existing conditions and that increased run-off does not occur or result in flooding of areas previously undisturbed. During design, all drainage works are designed based on the historical flood data and flood forecasting. A design discharge of 50 years return period is considered for culverts, and 100 years of bridges. Embankments of the Project road will obstruct surface runoff and culverts are proposed for all small drains including agricultural drains. If, during the operational phase of the Project, the rehabilitated road does result in increased run-off and flooding, the ARS shall be responsible for rectifying this issue.
- Construction Camps – no construction camp, permanent or temporary, shall be located within 500 meters of the Kur River, or any of the Wetlands identified in Tables 4-1 and 4-2 of this report.

<u>Pre-construction Phase</u>

- Construction Camps – The Contractor shall be responsible for the preparation of a Construction Camp Site Plan which will form part of the CEMP. The Plan shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. The Contractor shall ensure the following conditions are met within the Plan:
  1. Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.
  2. There shall be no direct discharge of sanitary or wash water to surface water, including the Kur River or any of the Wetlands identified in Table 4-1 and 4-2 of this report. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited.
  3. Liquid material storage containment areas shall not drain directly to surface water (including wetlands).
  4. Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.
  5. Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters.
  6. Discharge of sediment-laden construction water directly into surface watercourses or wetlands will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.
  7. Spill clean up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage:
     - Fueling operations shall occur only within containment areas.

- All fuel and chemical storage (if any) shall be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.
- Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.
- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.
- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.
- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.
- Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal. Disposal of such was shall be undertaken by a waste management company contracted by the Contractor. The waste management company must have the required licences to transport and dispose of hazardous waste before any such waste is removed from the site. The Contractor will keep copies of the companies licenses and provide waste transfer manifests at his camp site for routine inspection by the CSC.

Site plans shall be devised to ensure that, insofar as possible, all temporary construction facilities are located at least 100 meters away from the Kur River or any other water course, stream, canal or wetland listed in Tables 4-1 & 4-2. If determined warranted by the CSC, the Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites (see **Appendix E** for proposed designs). If so requested, the Contractor shall ensure that all vehicle are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.

Construction Phase

- Construction Camps and Storage Areas – The CSC shall undertake regular monitoring of the construction camps on both roads and the storage areas to ensure compliance with the CEMP and the Construction Camp Site Plan.

- Kur River - There is no river crossing on either the R45 or R46, however existing channels are playing the role of water migration ways for fish and other aquatic species. It is also important to take into account that all channels within project area are directly connected to the main water course in the country – Kur River and any contamination of water in the small channel will lead to pollution of water inside the river. Thus it is important that both the Contractor and CSC shall keep attention on stockpiles allocation in the distance at least 100 m away from any water course, including the wetlands identified in Tables 4-1 & 4-2. It is also important to keep storage of hazardous substances the same distance from any water body to avoid water contamination in case of the spillage.
- Water supply – There shall be no extraction of water by the Contractor from any of the Wetlands identified in Tables 4-1 and 4-2.
- Drainage and Flooding - During the construction phase the Contractors for all roads are required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works. The Contractors shall arrange with the village representatives those works which might interfere with the flow of irrigation waters to be carried out at such times as will cause the least disturbance to irrigation operations. Should any operation being performed by the Contractor interrupt existing irrigation facilities, the Contractors shall restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption.

5.5.6 Natural Hazards

Apart from the issue of potential flood events, discussed above under Climate Change, no other impacts to the Project are anticipated as a result of natural hazard events.

5.6 IMPACTS TO BIOLOGICAL RESOURCES

5.6.1 Flora

5.6.1.1 Potential Impacts to Flora

Design Phase - The area of the road corridor is characterized by semi-desert climate with absence of natural arboreal vegetation and some tamarisk bushes occurring. Existing semi-desert vegetation is under high overgrazing pressure and most of the surrounding open lands are used as pastures. Impact to such vegetation will be temporary as the project will not involve permanent use of new lands.

However a number of trees exist along the existing road corridor. Most of the trees are planted as two-three lines along the roadsides within numerous villages. These human protection tree-belts have been created to mitigate

impact of noise, dust and exhaust to the residential areas. There are few young planted trees but most of the trees are 10-20 years old. Fortunately most of plantation are taking place at one road side only and asymmetrical widening can reduce the amount of trees needed to be cut.

5.6.1.2 Flora Mitigation Measures

Design and Pre-construction Phase - The exact calculation of trees subjected to cutting or re-planting can only be completed during the design phase. Based on preliminary investigations (without a detailed design) the list of potentially affected trees can be observed below in **Table 5-2**. As the trees planted along both R45 and R46 roads are not included in the State Forest Fund, the calculation of the trees that are going to be cut down and those trees that are going to be re-planted shall be conducted by both representatives of the ARS PIU (or CSC / Contractor) and local Department No 3 of Ministry of Ecology and Natural Resources (MENR). The results of the field observation are then presented to the State Expertise Department of the MENR for further financial calculation.

The MENR shall then present the conditions of financial compensation to the ARS to be completed before or within the project implementation period.

Compensation is calculated subject to type of tree and thickness of the trunk. Every single cut tree shall be compensated with 3-5 (depend from type and age of cut tree) new planted trees with estimated age of 3-5 years (depend from the tree species and climate type).

The tree cutting process is conducted by the Contractor with participation of local Department No 3 of MENR – the Contractor will be obligated to inform local department three (3) days before cut process. Each cutting action shall be acted and signed by all three sides: Contractor, CSC and MENR. All cut trees are transferred to the possession of MENR.

Young trees of small size (up to 3-5 m height) can be easily replanted. Those trees are not need in compensation but only in reimbursement for re-plantation works. All works connected with re-plantation can be conducted only by local Landscape Gardening Department or State Forest Fund.

Table 5-2: List of potentially affected trees for R45 and R46

Estimated Chainage	Tree Type	Road Side	Distance from the Centerline	Estimated Number of Trees
R45				
1+700	Willow	LHS	6	2

Estimated Chainage	Tree Type	Road Side	Distance from the Centerline	Estimated Number of Trees
	Willow	RHS	6-8	6
26+200	Poplar	LHS	8	10
	Willow	RHS	8-10	15
31+700	Willow, Poplar	LHS	8-10	12
	Willow	RHS	8	6
36+400	Poplar, Willow	LHS	8	25
	Poplar, Willow	RHS	10	15
R46				
6+100	Willows (just planted, 1-2 m height, possible for replanting)	RHS	6	50
9+900	Poplar	RHS	6	28
11+800	Willow	LHS	6	20
	Willow	RHS	7	14
13+100	Willow	RHS	7	2
	Willow	LHS	6	3
16+500	Willow	RHS	7	7
	Willow	LHS	8	20
16+700	Willow	RHS	7-8	27
	Willow	LHS	6	30
17+800	Willow	RHS	7	6
	Willow	LHS	6	6
19+500	Willow	RHS	7	17
	Poplar	LHS	6	4
23+900	Willow	RHS	6	2
	Willow	LHS	6	3
27+700	Willow	LHS	6	1

The Contractor shall be responsible for ensuring the trees are maintained for a period of at least six months.

5.6.2 Fauna

5.6.2.1 Potential Impacts to Fauna

Impacts to fauna are expected to be minimal as rehabilitation of the existing roads are do not require new land, alignment, etc. It is also important to note that both R45 and R46 are passing via quite populated areas with high anthropogenic pressure and that the level of biodiversity here is not very high. Most of species are quite common and widely distributed.

Impacts that may occur to fauna include the following:

- Birds and Birds of Prey - Different species of passerine birds and birds of prey can be directly affected in case of start of tree cutting process within breeding season. However, there are no endangered species breeding along the Project corridor and thus it is not necessary to conduct additional research for every tree cutting.
- Siting of Construction Facilities - Establishment of service objects (camps, plants, workshops, warehouses etc.) is another serious impact to fauna resulting in temporary loss of habitat, potential pollution with domestic and industrial waste products, long-term disturbance, etc.
- Animal Husbandry - Animal husbandry is traditionally developed in the Project area. Most of residents of Project villages are owners of different livestock (mainly sheep, cows and buffalos). Additionally some separate farms can be observed along the project roads (especially at R45). The population of domestic animals increases sharply in winter time with sheep moved here from high mountain summer pastures. Most of farmers own lands located by both sides of the project road and require regular movement of their sheep's flocks from one side of the road to another for night shelter and drinking. Increased traffic volume and speed can create dangerous situations for both livestock and drivers.
- Protected Species - There are some locally and internationally protected species occurring within Project Roads corridor and on surrounded areas. The impact of the present project is not expected to be high and can be mitigated by the number of measures described below in the **Table 5-3**.

5.6.2.2 Fauna Mitigation Measures

In general designing of sufficient number of box and pipe culverts (for both existing water streams and the drainage box and pipe culverts (dry during non-rainy period) can help to avoid general impact of the road to most of wildlife species. This is quite important as with road rehabilitation the volume

and speed of the traffic will raise and thus it will lead to increasing the number of accident with animals especially during night time. It is also important to provide speed limitation signs both during construction and operational phases to mitigate this impact.

Birds - to avoid direct damage to the nests and mortality of birds it is important to restrict tree cutting process within breeding their period (May to July).

Siting of Construction Facilities - The mitigation of impacts includes: location of the structures shall be at least 500 m away from such sensitive habitat as Kur River bank and the wetlands listed in Tables 4-1 and 4-2; demolishing of existing structures (houses, barns and any other) shall be avoided as they can be the shelters and breeding habitat for many species of animals and birds.

Animal Husbandry - There are two options to mitigate impacts to animal husbandry, the best way is to design sufficient number of livestock underpasses along the both roads in vicinity of residential areas and farms or to provide speed limitation measures (traffic regulation signs, speed humps etc.) within residential sections.

Table 5-3. Construction impact and mitigation measures for endangered species.

Species	Protec-tion Status	Potential impact	Mitigation measures
European Pond Turtle (*Emys orbicularis*[b])	IUCN	This species as other non-protected Caspian Turtle sharing the same habitat of different channels crossed by the Project road. Both species can be directly impacted during culverts construction works or indirectly in case of water stream blockage or/and extinction.	Prior to construction of box and pipe culverts at existing water streams, next measures shall be undertaken: section of stream intended for construction shall be blocked; water pumped and all turtles collected and set out to the neighbor water stream; long term channels blockage shall be avoided.

Greek Tortoise (*Testudo graeca*[c])	AzRDB & IUCN	This is one of most distributed terrestrial species within the project area. The tortoise can be directly affected by loss of foraging lands or vehicle accident during crossing the roads. Indirect impact is including the soil compaction and pollution.	Provision of proper number of dry small underpasses and installation of speed limitation system will help to avoid the impact of habitat fragmentation. Proper service objects management (as described above) will aloud to avoid habitat loss. Proper management of harmful substances and waste will minimize the risk of soil and water pollution. Banning on hunting or/and trapping of animals by workers shall be established and controlled. All tortoises noted within working sites shall be collected and let out to suitable habitat.

Dalmatian Pelicans (*Pelecanus crispus*[c]); White Pelican (*P. onocrotalus*[a]); White Headed Duck (*Oxyura leucocephala*[b]) and many other protected species of ducks	AzRDB & IUCN	These species do not have resident habitat within project corridor, however they are quite regular visitors of Kur River bed within migration and wintering seasons. Any impact to the river can lead to direct and indirect (downstream habitats) affect of these species.	Any hunting or/and trapping of birds by workers shall be strictly prohibited. Any discharge of waste water to the river shall be avoided. Location of any service objects including camps, plans, workshop, warehouse, waste storage sites shall be at least 500 m away from the Kur River. Location of stockpiles of embankment materials, sand, gravel and other inert materials shall be located in at least 100 m away from the river and rather RHS from both R45 and R46 to keep the roads as prevention barrier for hazardous spills. Equipment washing in the river bed as well as on the river banks shall be strictly prohibited and controlled.
Western Barbastelle (*Barbastella barbastella*[b])	IUCN	This small bat is use to has daily shelters within usable and especially desolated constructions. The garrets and small cracks in the walls etc. can be used by these small mammals. Demolishing works can lead to these animals mortality. Another problem is that most of local people are frightened by all bat species accounting them as forces of evil and killing them.	Demolishing works of any constructions such as houses, shed, barns etc. shall be avoided or preliminary observation by environmental specialist shall be undertaken. In case the shelters of this bat will be found, the Contractor and the CSC shall keep the control that workers will not damage the shelter and kill the animals. It is also important that Contractor will provide environmental

			training to inform all personnel about importance of this species.
Marbled Polecat (*Vormela peregusna*[a])	AzRDB	This small predator is quite rare here but project surrounding territory is one of its last habitats within the country. There is no date that this animal is using somehow project roads or even crossing it. However it can be affected in result of site clearance for service and access roads providing as well as within service objects construction.	Use of herbicides, pesticides and other such type of chemicals to reduce volume of grass and number of rodents within camps, plants and any other service objects shall be prohibited. Banning on hunting or/and trapping of animals by workers shall be established and controlled.
African Wildcat (*Felis libyca*[a])	AzRDB	This is extremely rare wild cat that still may occur at the area. Mostly this animals use to have shelters within dense tamarisk shrubs along the river and can regularly cross the road following to their foraging habitats. This species can be affected in result of site clearance for service and access roads providing as well as within service objects construction. The risk of impact by increased traffic is also exist during further road exploitation.	Provision of proper number of dry small underpasses and installation of speed limitation system will help to avoid the impact of habitat fragmentation. Banning on hunting or/and trapping of animals by workers shall be established and controlled.
Manduca atropos[a], *Megalocephalus euphraticus*[a]	AzRDB	Both insect species conduct nocturnal life. Hawkmoth habitat is mainly connected to arboreal plants and this species prefer the fruit gardens. Beetle is	Use of herbicides, pesticides and other such type of chemicals to reduce volume of grass and number of insects within camps, plants and any other service objects

		occurring on open salty lands. These species can be affected by the project activity in case of tree cutting and soil disturbance.	shall be prohibited. Proper management of harmful substances and waste will minimize the risk of soil pollution. Minimization of impact to arboreal vegetation will help to protect foraging habitat for these species. Banning on collection or/and killing of these insects by workers shall be established and controlled.

In addition to the above mitigation measures, it is noted that animal husbandry is the main agricultural activity at the area, and as such one livestock underpass shall be constructed within 500 m distance (before or after) of each village. The exact locations of the animal underpasses will be determined by the Design Consultant.

5.6.3 Protected Areas

There are no Protected Areas within the vicinity of the Project corridor that are anticipated to be impacted by Project works. To ensure that no local roads are selected that pass through or adjacent to any protected areas, the ARS and the Designers shall complete the attached Local Roads Environmental Screening Protocol (see **Table 6-7**).

5.6.4 Borrow Pits

5.6.4.1 Potential Borrow Pit Impacts

There are two potential borrow areas that have been identified for extraction of embankment materials – Kalmas and Babazanan hills. The flora and fauna of both areas are not particularly high as both sites had been recently used for material extraction by previous contractors. However location of Babazanan borrow area in direct adjacent to Shirvan National Park and regular visits to this site by Persians Gazelles makes this site too sensitive for future exploitation and extraction materials from this site should be avoided.

5.6.4.2 Borrow Pit Mitigation Measures

Exploitation of Kalmas borrow area is preferred, but the potential impact to flora and fauna should be taken into account and relevant mitigation measures shall be applied as follows:

- Borrow Pit Plan – The Contractor shall prepare a Borrow Pit Action Plan (BAP) that should be submitted to the CSC prior to the start of construction. The plan will identify the locations of all proposed borrow pits taking into account the recommendations of this report. The locations of the borrow pits shall be approved by both the CSC and the MENR. The plan shall ensure that:
  - Pit restoration will follow the completion of works in full compliance all applicable standards and specifications.
  - Arrangements for opening and using material borrow pits will contain enforceable provisions.
  - The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the CSC will be required before final acceptance and payment under the terms of contracts.
  - Additional borrow pits will not be opened without the restoration of those areas no longer in use.
- Loss of top soil - Before the materials extraction the layer of top soil (about 20 cm) shall be removed to the side of excavation area and kept until the area exploitation will be finalized. Top soil stockpiles shall be located at least 50 meters distance from any watercourses to avoid water siltation and obstruction. The height of stockpiles shall not exceed three meters to avoid wind erosion and dust emissions.
- Loss of vegetation - The original vegetation of the area is very poor. There is no wood or shrub growing on the hills; grasses can be observed during short spring or autumn period of vegetation and scattered patches of wormwood and saltwort are only plants can be wound during whole year around. During site exploitation this vegetation will be removed during site clearance stage however in case of proper storage of top soil and further site reinstatement vegetation can naturally recover with the seeds conserved in the top soil.
- Soil compaction and disturbance to local flora and fauna species at access roads - The Contractor shall take responsibility to provide an access road to the borrow site and all drivers shall be instructed to use only this officially designated road. This will help to avoid additional soil compaction and disturbance to the local fauna species.
- Direct damage to flora and fauna species - Prior to material extraction activity environmental training shall be provided to the Contractors workers, drivers and equipment operators. Plants collection, hunting or/and trapping of animals by workers shall be strictly prohibited.
- Reinstatement - Full site reinstatement shall be undertaken by the Contractor to avoid landscape damage and habitat loss. Rehabilitation measures shall include: removing of all types of equipment from the site;

removing of all types of waste or/and polluted soil and materials if any exist; slops grade reduction with use of unsuitable stockpiles and uncrushed rocks and; slope stabilization measure such as re-covering with top soil, and further seeding, grassing and planting of appropriate bushes or/and trees if reasonable.

- Due to the sensitivity of the borrow pit locations, the Borrow haul routes should follow established transport corridors/rights-of-way, to the extent that is practicable.

5.7 IMPACTS TO SOCIO-ECONOMIC RESOURCES

5.7.1 Infrastructure

5.7.1.1 Potential Impacts to Infrastructure

Drainage Infrastructure - construction activities will include the demolition or rehabilitation of existing drainage structures and construction of new drainage structures along the alignment. Design errors could lead to portions of the drainage network operating below the required standard and lead to erosion of embankments, road washout, flooding, inadequate flow of water to and from agricultural land and dangerous driving conditions.

Roads - During the construction phase, it may be inevitable that disruption of existing traffic and local accessibility are impaired which may cause problems with the local community. Within the Project Corridor the operations of a number of retail shops, mechanic shops and some restaurants, etc., may also be affected during construction in terms of access.

Utilities - Medium and low voltage power lines and gas pipes are located within the Project corridor. It is possible that transmission lines and gas pipes close road maybe impacted during construction.

Irrigation – Several irrigation channels cross the Project corridor. Project works will require temporary diversions of these channels. **Table 5-4** indicates the locations of the identified irrigation channels.

Table 5-4: Irrigation Channels

#	Location (km)	#	Location
R45		R46	
1	6.8	1	3.0
2	25.3	2	6.6
3	30.4	3	8.1
4	31.7	4	9.3

5	32.7	5	17.0
6	33.6	6	29.6

5.7.1.2 Infrastructure Mitigation

Drainage - As mentioned above under the Item relating to Hydrology (**Section 5.4.5**) detailed designs will ensure that all drainage structures are sized and located correctly. During the construction phase the CSC will ensure that the Contractor follows the design documents with respect to the required infrastructure facilities.

Roads - To mitigate the potential impacts the Contractor should:

- Submit a Traffic Management Plan to local traffic authorities prior to mobilization and include the plan as part of his CEMP;
- Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions;
- Allow for adequate traffic flow around construction areas;
- Provide adequate signalization, appropriate lighting, well-designed traffic safety signs, barriers and flag persons for traffic control; and
- Provide temporary access where accessibilty is temporarily restricted due to civil works.

Should the Contractor use any areas for borrow materials, any access roads should be maintained during the construction phase and rehabilitated at the end of construction by the contractor himself to the satisfaction of the local authorities and in compliance with the contract. Compliance shall be monitored by the CSC.

Utilities - During construction all power lines and gas pipes in the Project Corridor shall be kept operational, this will include temporary transmission lines while existing poles and lines are moved.

Irrigation – **Item 5.4.5.2** outlines the process for temporary disruptions to irrigation systems. A Grievance Mechanism has also been prepared (**Appendix C**) in case of any disputes between farmers, landowners and the Contractor regarding this, and other matters. In addition, regular community meetings (monthly in for each Contract) will be scheduled by the Contractor to ensure that regular information exchange is made between both parties during the construction period.

5.7.2 Land Use

5.7.2.1 Potential Impacts to Land Use

Design Phase - As the **Project** roads involve reconstruction and rehabilitation of an established road corridor, the Project impact on the land acquisition is reduced to a minimum. However, to ensure land acquisition issues are addressed appropriately a Resettlement Policy Framework (RPF) is currently being prepared by an International Consultant as part of the Projects feasibility study. During the design stage the social specialist of the Consultant will verify current scope of impact to the social environment and in case of any impact to the private property a Land Acquisition Resettlement Plan (LARP) will be prepared as per requirements of the WB Operation Procedures and National Legislation of Azerbaijan.

Construction Phase - Potential impacts to land uses outside of the RoW during the construction stage are limited to the creation of Construction Camps and other ancillary facilities such as borrow pits. Construction workers camps constitute a temporary land use change and raise issues related to activities such as poor sanitation arrangement and improper methods used for disposal of solid wastes and effluent; and transmission of communicable diseases to the local people by the construction workers due to inappropriate health monitoring facilities. Issues relating to borrow pits are discussed under the heading of Borrow Pits above.

5.7.2.2 Infrastructure Mitigation Measures

Design Phase - Before the commencement of the construction works at any part of the Project, The Employer (ARS) must prepare the LARP if required, obtain the approval of the World Bank and then implement the plan and acquire the land. The LARP will be processed by the Employer and World Bank during the bidding period, and it does not require any action of the Contractor. It will be approved and implemented before the Commencement Date.

Construction Phase – The Contractor will be required to coordinate all construction camp activities with neighboring land uses. Contracts for the Project activities will also require construction operators to maintain and cleanup campsites and respect the rights of local landowners. If located outside the ROW, written agreements with local landowners for temporary use of the property will be required and sites must be restored to a level acceptable to the owner within a predetermined time period.

5.7.3 Waste Management

5.7.3.1 Potential Impacts from Waste

Construction Phase - Road construction will inevitably generate solid and liquid waste products including:

- Inert waste – for example, uncontaminated roads and soil, concrete, masonry and bricks, wood and plastics;
- Hazardous waste – acids and alkaline solutions, waste oils and oily sludges, batteries, asbestos, and bitumen.

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

5.7.3.1 Waste Mitigation

Where possible, surplus materials will be reused or recycled. Oils, fuels and chemicals (including bitumen, bridge deck waterproofing agents and concrete) are substances which are hazardous to human health. They need to be stored properly in correctly labeled containers. Bitumen, oil and fuel should be stored in tanks with lined bunds to contain spillage. Proper storage and handling of hazardous materials reduces wastage and reduces the risk of spillage which could cause temporary or long-term contamination of the underlying soil and possibly to pollution of groundwater and/or watercourses; some (e.g. concrete) may have serious impacts on freshwater fauna. As well as being a cause of complaints by the local population, this may lead to contravention of local regulations and fines being imposed on the Contractor. Proper storage and management reduces the risk of vandalism and theft. Disposal of waste materials shall be undertaken by a waste management company contracted by the Contractor. The waste management company must have the required licenses to transport and dispose of both inert and hazardous waste before any such waste is removed from the site. The Contractor will keep copies of the waste management company's licenses and provide waste transfer manifests at his camp site for routine inspection by the CSC.

In the absence of functioning sewerage and sewage treatment facilities in most of Azerbaijan, it is recommended that the Contractor is required to provide his own on-site wastewater treatment facilities. For sites servicing a small number of employees (less than 150), septic tanks may be used. For larger sites, liquid wastes should as a minimum receive primary treatment in anaerobic tank or pond preceded by a bar screen to remove large solid objects (e.g. sticks, rags). Primary treatment (also referred to as clarification, sedimentation or settling) is the process where wastewater is allowed to settle for a period (around 2 hours) in a settling tank. This leads to separation of a liquid effluent which includes oils and grease and a liquid-solid sludge. Primary treatment leads to reduction in suspended solids, biological oxygen demand and removal of floating material (e.g. faeces). There will be no

direct discharge of untreated sanitary or oily wastewater to surface water bodies.

To ensure all of the above conditions are met, the Contractor for both roads shall be responsible for the preparation of a Waste Management and Recycling Plan. The Plan shall include items relating to the safe handling and management of:

- Domestic waste
- Food waste
- Inert garbage
- Recycled Waste
- Plastic
- Metals
- Wood
- Construction Waste
- Hazardous Waste
- Liquid Waste

The Plan will also include provisions to manage all excess spoil material. The Plan should indicate where the spoil will occur and methods and locations for disposal. The Plan shall be approved by the CSC, and ARS as part of the CEMP approval process. Oversight of the implementation of the Plan is the responsibility of the CSC as outlined in the EMP.

5.7.4 Population

5.7.4.1 Potential Impacts to Populations

In as much as the project is rehabilitation of the existing roads only, it does not have the social, economic and community life concerns that are associated with new road construction, this road improvement project is generally aimed at bringing benefits to surrounding communities through lower transport costs and better access to market places, jobs, and services such as health and education. Road construction and rehabilitation projects can lead to changes in the community or social environment around the road, influencing various aspects of lifestyles, travel patterns, social and economic activities.

5.7.4.2 Mitigation Measures

Road construction works will have short-term negative impacts to the population of the road corridors, such as air quality and noise impacts and potential social impacts resulting from imported labour. However, in general the impacts to population and communities will be overwhelmingly beneficial from all project activities. Imported labour can however, also lead to a spread of sexually transmitted disease which is discussed below under **Item 5.6.6**.

5.7.5 Socio-Economic Conditions

5.7.5.1 Potential Socio-economic Impacts

The Project is expected to have significant beneficial impacts to the economy of the Project area. The key benefits include:

- Improved access to markets – The road will improve access to markets for farmers along the entire Project Road alignment;
- Reduction in travel times – Journey times from Salyan to Shirvan and between villages along the road will reduce;
- Reduction of maintenance costs – maintenance of vehicles due to poor road condition drives up the costs of agricultural products;
- Increased Reconstruction effort in remote areas - improved access to these areas may also allow a more intense level of reconstruction effort in the remote areas including facilities such as schools and clinics.
- Improved access to health and education facilities – Improved road conditions will most likely result in increased traffic on the roads including mini-bus and taxi services, this will enable people to access health care and educational facilities more easily; and
- Creation of Jobs - The community along the alignment of sub-project will have opportunities for temporary employment during construction. Albeit, this opportunity is temporary in nature, this will be beneficial.

5.7.5.2 Socio-economic Mitigation

All impacts identified are beneficial. However, whenever possible, the Contractor shall employ local labor to benefit local communities and to promote the overall acceptance of the project. As part of the maintenance of the road the ARS should also look into the possibility of employing the local people for the maintenance of roadside drains upon completion of rehabilitation works.

5.7.6 Health and Safety

5.7.6.1 Potential Health and Safety Impacts

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

- Easier access to health care facilities. Positive health impacts may result due to quicker response time in emergency situations and improved access to health care facilities for those living in remote areas;
- Air quality. The amount of particulate matter, or dust, generated by vehicle movement may increase slightly during construction works (mitigation for this issue is provided under **Item 5.4.4 – Air Quality**), but will decrease the operational phase of the Project. This will have positive

impacts to the health of the population living and working adjacent to the road.

- Contamination of local water supplies during construction. Potential impacts to local water supplies include the possibility of temporary labor camps and the water supply and wastewater disposal associated with them during the construction period.
- Noise levels with health consequences. Potential noise issues are discussed in **Item 5.6.10 – Noise** below;
- Public Safety. Construction activities may result in an increase in the total number of road traffic accidents between vehicles, pedestrians and vehicles and livestock and vehicles;
- Worker Safety. Accidents are common during a project of this size and scale. Accidents can occur if workers are not adequately trained or qualified for the job or if they have incorrect safety equipment and clothing; and
- Sexually Transmitted Diseases. Road provision and increasing human movement have emerged as key factors influencing the HIV epidemic in many regions of the world. Of particular concern is the movement of the HIV virus from urban areas of higher infection concentration to rural communities. In addition, the acceleration of social and economic change in rural areas associated with a rise in itinerant construction workers, the demand for commercial sex and the creation of transport hubs that sustain this trade are further areas of concern.

5.7.6.2 Health and Safety Mitigation Measures

Public Safety – To ensure public safety the Designers shall include safety barriers and marking of hazardous areas in accordance with Safety Regulations for Construction, Rehabilitation and Maintenance, 1978. In addition, it shall be the responsibility of the Contractor to provide safe access through the construction site to people whose residences/shelters and routes are temporarily severed by road construction.

Worker Health and Safety – A Health and Safety Plan shall be prepared by the Contractor to manage worker safety. The Plan shall include the following items:

- Safety Training Program. A Safety Training Program is required and shall consist of:
  - Initial Safety Induction Course. All workmen shall be required to attend a safety induction course within their first week on Site.
  - Periodic Safety Training Courses. Period safety course shall be conducted not less than once every six months. All Subcontractor employees will be required to participate in relevant training courses appropriate to the nature, scale and duration of the subcontract works. Training courses for all workmen on the Site and at all levels of supervision and management.

- Safety Meetings. Regular safety meetings will be conducted on a monthly basis and shall require attendance by the safety representatives of Subcontractors unless otherwise agreed by the CSC. The CSC will be notified of all safety meetings in advance. The CSC may attend in person or by representative at his discretion. The minutes of all safety meetings will be taken and sent to the CSC within seven (7) days of the meeting.
- Safety Inspections. The Contractor shall regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. Lights and signs shall be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately.
- Safety Equipment and Clothing. Safety equipment and protective clothing are required to be available on the Site at all material times and measures for the effective enforcement of proper utilization and necessary replacement of such equipment and clothing, and all construction plant and equipment used on or around the Site shall be fitted with appropriate safety devices. These shall include but not be limited to:
    - Effective safety catches for crane hooks and other lifting devices, and
    - Functioning automatic warning devices and, where applicable, an up-to-date test certificate, for cranes and hoists.

In addition, all Project sub-contractors will be supplied with copies of the CEMP. Provisions will be incorporated into all sub-contracts to ensure the compliance with the CEMP at all tiers of the sub-contracting. All subcontractors will be required to appoint a safety representative who shall be available on the Site throughout the operational period of the respective sub-contract unless the CSCs approval to the contrary is given in writing. In the event of the CSCs approval being given, the CSC, without prejudice to their other duties and responsibilities, shall ensure, as far as is practically possible, that employees of subcontractors of all tiers are conversant with appropriate parts of the CEMP. To implement the above items the Contractor should designate a qualified environmental, health and safety personnel who will anticipate and address hygienic issues in coordination with the MOH's Regional Disinfection Centre and the local health and safety officer.

Sexually Transmitted Diseases – It shall be a requirement of the Contract that the Contractor subcontracts with an Approved Service Provider to provide an HIV Awareness Program to the Contractor's Personnel and the Local Community as soon as practicable after the Contractor's Personnel arrive at the Site but in any case within two weeks after the Contractor's Personnel

arrive at Site and to repeat the HIV Awareness Program at intervals not exceeding four months.

5.7.7 Educational facilities

Impacts to educational facilities relate predominantly to noise and health and safety issues. Both of these topics are discussed under separate sections (**5.6.6 – Health and Safety** and **5.6.9 – Noise**).

5.7.8 Cultural Heritage

5.7.8.1 Potential Impacts to Cultural Heritage

No sites of cultural importance have been identified during the study. However, given Azerbaijan's rich cultural heritage it is possible that chance finds could occur.

5.7.8.2 Cultural Heritage Mitigation

To mitigate impacts to cultural resources in the event of a chance find the following procedures shall apply, as required by the Ministry of Culture:

Items 13 and 14 of the "Law on the Protection of Historical and Cultural Monuments of Azerbaijan Republic" state that "if a monument is found during any construction or other works, the works should be immediately stopped and relevant authorities (Ministry of Culture) and Azerbaijan Science Academy taking into consideration expert evaluation.

If construction or other works are conducted in the area of historical or archeological importance, this area is initially examined by experts and initial inspection of monuments is provided. Relevant authorities (Ministry of Culture) provide participation of their representative or expert in the construction site.

5.7.9 Noise

5.7.9.1 Potential Noise Impacts

Construction Phase - Noise during the construction phase will mostly come from the operation of construction equipment. Typical noise signatures of the different equipment for different construction activities are enumerated below.

Table 5-5: Construction Noise Examples

Site Clearing		Excavation and Earth Moving		Structure Construction	
Equipment	Noise Level	Equipment	Noise Level	Equipment	Noise Level
Bulldozer	80	Bulldozer	80	Pneumatic drill	81-98
Front end	72-80	Backhoe	72-93	Crane	75-77

loader					
Dump Truck	83-94	Dump Truck	83-94	Welding Machine	71-82
Grading and compacting		Jack Hammer	80-93	Concrete Mixer	74-88
Grader	80-93	Landscaping and Clean Up		Concrete Pump	81-84
Roller	73-75	Bulldozer	80	Concrete Vibrator	76
Paving		Excavator	72	Air Compressor	74-87
Paver	86-88	Truck	83-94	Bulldozer	80
Truck	83-94	Paver	86-88	Cement and Dump trucks	83-94
Tamper	74-77				

The noise levels are dependent on the model and the maintenance status of the equipment. Construction noise can be a nuisance to residents living along the road. Noise attenuation based on the doubling distance rule shows that residents living next to the road will occasionally be exposed to high noise levels if no mitigation measures are implemented.

Operation – During the operational phase of the Project noise levels from vehicle movements are likely to increase above the current levels as traffic volumes increase. No noise modeling was specified in the Terms of Reference for this EIA study and no traffic surveys have been completed to date. Accordingly making any judgment on the potential noise impacts during the operational phase of the Project is a subjective exercise. Looking at previous EIAs, such as those completed for the World Bank M6 Rehabilitation Project (a similar specification to this Project), it is noted that no noise barriers are recommended for that project. Noise barriers have been recommended for portions of the M3 and M4 roads which are both four lane motorways with different design standards connecting major urban hubs. The areas where noise barriers have been recommended for these motorways are those where the motorway passes through urban areas.

For this Project the design speeds of 50 kilometers per hour are the standard for urban areas and 100 kilometers per hour for flat undulated terrain. If we consider the following:

1. A figure of 5,000 vehicles using the project roads per day (this figure is considered high when compared to the predicted M3 traffic of around 11,000 vehicles per day on a four lane motorway in 2020).
2. A mix of light and HGV vehicles travelling 50 kilometers per hour through urban areas.

3. An embankment height of two meters
4. A distance of 20 meters to the receptor from the road centerline.

Using basic noise calculators we get an approximate daytime dB(A) of 64 and a nighttime figure of 58. Both these figures exceed the Azerbaijan noise standard of 60 and 45 dB(A) for residential areas. However, as stated above, these are very basic calculations without any clear indication of potential traffic volumes. For example, if traffic volumes halved, the daytime figure falls below 60 dB(A). Accordingly it is not considered prudent at this stage of the Project to recommend noise barriers for any other noise reduction methods without undertaking noise modeling with traffic forecasts.

5.7.9.2 Noise Mitigation

Design Phase – The Design Consultant shall prepare traffic counts during this phase of the Project. He shall then undertake noise modeling based on detailed designs (which clearly show the distance and height of urban dwellings from the road side) and the results of the traffic counts, and other environmental information, such as climate and wind directions. The objectives of the noise modeling are to assess which areas of the Project Corridor will be subjected to noise levels elevated above Azerbaijani noise standards during the operational phase of the Project (based on projections in 5 and ten years time). Based on the results of the noise modeling exercise the Design Consultant shall prepare designs for noise barriers where noise levels are anticipated to be exceeded within the Project Corridor. The design specifications shall be included in the Bill of Quantities supplied to potential Contractors during the construction contract bidding stage of the Project. The noise barrier design requirements and locations shall also be included in the Contractors contract.

Construction - the Contractor shall be responsible for ensuring the use of:

- Source Controls, i.e., requirements that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken;
- Site Controls, i.e., requirements that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible;
- Work near Sensitive Receptors shall be limited to short term activities. No asphalt plants, rock crushing plants or any long term generators of significant noise shall be allowed within 500 meters of sensitive receptors;
- Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the site CSC having due regard for possible

noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. When operating close to sensitive areas such as residential, nursery, or medical facilities, the Sub-Contractor's hours of working shall be limited to 8 AM to 6 PM;

- Community Awareness, i.e., public notification of construction operations will incorporate noise considerations; methods to handle complaints will be specified. Sensitive receptors will be avoided as possible (i.e., aggregate crushers, operators, etc.).

6. ENVIRONMENTAL MANAGEMENT PLAN

6.1 GENERAL

According to the Terms of Reference the Environmental Management Plan (EMP) should include the following items:

"Mitigation Plan – identify feasible and cost effective measures to reduce potentially significant adverse environmental impacts to acceptable levels. Compensatory measures should also be addressed where applicable and links should be provided to any other mitigation plans. Institutional arrangements for the implementation of this plan should be defined.

Monitoring Plan – identify and describe the monitoring measures that will be employed to track the effectiveness of the mitigation Plan. Describe the environmental parameters to be monitored, the monitoring methods, sampling locations, frequency, costs, detection limits and thresholds that will signal corrective actions. Outline the monitoring and reporting procedures. Institutional arrangements for the implementation of this plan should be defined.

Implementation Schedule and Cost Estimates – for (i) and (ii) above, provide an implementation schedule and a cost estimate (including the source of funds) and show the integration of these elements with overall project implementation plans."

Accordingly, the EMP provided herewith documents the impacts identified in this EIA report, the actions required to mitigate those impacts to acceptable levels in accordance with the laws of Azerbaijan and the World Banks Operational Policies, and the monitoring activities that are to be undertaken as part of the project to confirm that the mitigation actions have been

effective in achieving their objectives or to initiate changes in the actions required.

The EMP also details the institutional arrangements and capacities that currently exist, or that will be put in place as part of the project implementation, to ensure that the environmental due diligence (including the EMP) has comprehensively considered both Azeri and World Bank requirements for environmental protection, has identified all likely environmental impacts and proposed appropriate mitigation measures, and has the systems in place to ensure that effective procedures for environmental monitoring and control of the project impacts and mitigation measures are implemented throughout the life of the project. Finally, this section of the report provides the required implementation schedule and costs for the proposed mitigation and monitoring.

6.2 MITIGATION AND MONITORING

The environmental impacts associated with all three Project activities, have been detailed above in the relevant sections of this EIA. Mitigation measures required to address the impacts identified in the EIA have been summarized in each of the relevant sections covering the physical, biological and socio-economic environment affected by the project. The impacts identified and the specific mitigation measures proposed to address them have been consolidated into the **Environmental Mitigation and Monitoring Plan** presented in **Tables 6-1** and **6-1A** (for both R45 & R46) and **6-2** and **6-2A** (for local roads), which includes time frames, responsibilities and where applicable, estimated costs for each measure.

An Additional **Environmental Monitoring Plan** is presented in **Table 6-3** which outlines the activities and responsibilities associated with instrumental monitoring, i.e. Air Quality and Noise Monitoring.

6.3 IMPLEMENTATION ARRANGEMENTS AND RESPONSIBILITIES

The main institutions that will be involved in implementation of the EMPs for all three Project Components are ARS, the Design Consultants, the Construction Supervision Consultant (CSC) the Contractor and to a lesser extent the Ministry of Ecology and Natural Resources (MENR).

6.3.1 PIU Responsibilities

A Project Implementation Unit (PIU) established within ARS will be responsible for the day to day management of the Project components including implementation of the EMPs. The PIU currently has one Safeguards Specialist who is responsible for management of the environmental and social aspects associated with development of all donor funded road sector projects for which ARS is the responsible Executing Agency. The PIU (Safeguards Specialist) responsibilities in respect of implementation of the EMP are as follows:

- Ensure that all relevant EMP requirements (including environmental designs and mitigation measures) are duly incorporated into the project bidding documents.
- Review necessary permits and/or clearance, as required, from MENR and other relevant government agencies, ensuring that all necessary regulatory clearances are obtained by the Contractor before commencing any civil work on the project.
- Ensure that the Contractor has access to the EMP and EIA report.
- Ensure that the Contractor understands his responsibilities to mitigate environmental problems associated with their construction activities and facilitate training of their staff in implementation of the EMP.
- Approve the Construction Environmental Management Plan (CEMP) before Contractor takes possession of construction site.
- Undertake regular site visits to assess the Contractors compliance with the EMP and EIA and make recommendations to the Contractor where non-compliance issues are identified.

6.3.2 Design Consultant Responsibilities

The Design Consultant shall ensure that he reads and understands all of the identified environmental impacts highlighted by this report. He shall also ensure that all recommendations made in the design phase of the EMP are incorporated in the final detailed designs. The Consultant shall also prepare site-specific EMPs for local roads once those are identified. The site-specific EMP shall contain site assessment, information on the public disclosure, identify specific risks and propose adequate mitigation. The sample for the mitigation plan is presented below in Tables 6-2 and Environmental Management Plan in Table 6-2A, and any sample can be used at the discretion of the designer. In case of using Table 6-2 as a sample, a Monitoring Plan should also be prepared in accordance with the template provided in table 6-2A.

Table 6-1: Environmental Mitigation Plan – R45 & R46

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
Design Phase				
Climate Change	More extreme flood events	The Designers shall consider the potential for current and future flood events within the Project area and establish an appropriate embankment height and drainage measures to account for potentially more regular and more intense flood events.	Design Consultant	Included in design costs.
Hydrology	Poor design of drainage	Consideration in the design phase will be given by the Design Consultant to the issue of drainage and culverts to ensure that drainage patterns are improved from the existing conditions and that increased run-off does not occur or result in flooding of areas previously undisturbed.	Design Consultant	Included in design costs.
		During design, all drainage works shall be designed based on the historical flood data and flood forecasting.	Design Consultant	Included in design costs.
		A design discharge of 50 years return period shall be considered for culverts, and 100 years of bridges.	Design Consultant	Included in design costs.
Flora	Tree cutting	ARS PIU shall calculate numbers of trees to be cut based on surveys.	ARS PIU	500
		Compensation for the tree owners shall be according to the requirements set out in Item 5.5.1.2.	MENR to undertake financial calculations. ARS PIU to pay compensation.	25,000 (based on preliminary calculations).

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
			Contractor to cut trees.	
Fauna	Impacts to Livestock	As animal husbandry is the main agricultural activity at the area, one livestock underpass shall be designed within 500 m distance (before or after) of each village.	Design Consultant	20,000 per underpass.
		The design shall provide speed limitation measures (traffic regulation signs, speed humps etc.) within residential sections.	Design Consultant	Included in design costs.
	Impacts to protected species	The designs shall ensure that all of the measures outlined in Table 5-3 are implemented.	Design Consultant	Included in design costs.
Health and Safety	Road accidents.	To ensure public safety the designs shall include safety barriers and marking of hazardous areas in accordance with Safety Regulations for Construction, Rehabilitation and Maintenance, 1978.	Design Consultant	Included in design costs.
Noise	Elevated traffic noise.	To ensure operational noise levels are assessed correctly the following recommendations are made: • Prepare traffic counts during this phase of the Project. • Undertake noise modeling based on detailed designs (which clearly show the distance and height of urban dwellings from the road side) and the results of the traffic counts, and other environmental information, such as climate and wind directions.	Design Consultant	Included in design costs.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
		• Assess which areas of the Project Corridor will be subjected to noise levels elevated above Azerbaijani noise standards during the operational phase of the Project (based on projections in 5 and ten years time). • Based on the results of the noise modeling exercise prepare designs for noise barriers where noise levels are anticipated to be exceeded within the Project Corridor. • The design specifications shall be included in the Bill of Quantities supplied to potential Contractors during the construction contract bidding stage of the Project. • The noise barrier design requirements and locations shall also be included in the Contractors contract.		
Pre-Construction Phase				
Air Quality	Dust from construction camps and borrow pits	Contractors locations for borrow pits, rock crushing facilities and asphalt plants shall require approval from the CSC, ARS PIU and MENR during the Pre-construction phase.	CSC, ARS and MENR to approve locations.	None
		No asphalt plant shall be located within 500 meters of any urban area, protected area or sensitive receptor.	Contractor to ensure correct siting.	None
		The Contractor shall be responsible for the preparation of an Air Quality Plan	Contractor	Part of the CEMP costs.
Soils	Permanent loss of land.	Before the commencement of the construction works of the Project at any road the Land Acquisition and Resettlement	ARS	See LARP for associated

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
		Plan (the LARP) must be prepared and approval obtained from the World Bank. Finally the plan must be implemented and the land acquired prior to the start of construction.		costs.
	Spills and leaks of liquids	The Contractor will be responsible for preparation of an Emergency Response Plan (ERP) which will cover containment of hazardous materials, oil spills, and work-site accidents	Contractor	Part of the CEMP costs.
Hydrology	Impacts to hydrology from Construction Camps	The Contractor shall be responsible for the preparation of a Construction Camp Site Plan which will form part of the CEMP. The Plan shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. No construction camp, either temporary or permanent, shall be located within 500 meters of the Kur River or any of the Wetlands listed in Tables 4-1 and 4-2.	Contractor	Part of the CEMP costs.
Fauna	Impacts to wildlife	The location of permanent structures shall be at least 500 m away from the Kur River bank and any of the Wetlands listed in Tables 4-1 and 4-2 of this report.	Contractor to ensure correct siting.	None
		Demolishing of existing structures (houses, barns and any other) shall be avoided as they can be the shelters and breeding habitat for many species of animals and birds. Where this is unavoidable surveys of the properties shall be undertaken prior to demolition to ensure that no animals and birds will be affected.	Contractor to hire specialists to undertake surveys.	1,500

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
	Impacts to protected species	The Contractor shall ensure that all of the measures outlined in Table 5-3 are implemented.	Contractor	Part of general construction costs.
Borrow Pits	General impacts from borrow pits	Prepare a Borrow Pit Action Plan (BAP). The plan will identify the locations of all proposed borrow pits taking into account the recommendations of this report. The plan shall ensure that: • Pit restoration will follow the completion of works in full compliance all applicable standards and specifications. • Arrangements for opening and using material borrow pits will contain enforceable provisions. • The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the CSC will be required before final acceptance and payment under the terms of contracts. • Additional borrow pits will not be opened without the restoration of those areas no longer in use.	Contractor	Part of the CEMP costs.
Infrastructure	Impacts to traffic and roads	Prepare and submit a Traffic Management Plan to local traffic authorities prior to mobilization.	Contractor	Part of the CEMP costs.
Waste Management	General impacts from waste	Preparation of a Waste Management and Recycling Plan. The Plan shall include items relating to the safe handling and management of Domestic waste, Food waste, Inert garbage, Recycled Waste, Plastic, Metals, Wood, Construction Waste, Hazardous Waste and Liquid Waste. The Plan will also include provisions to manage all excess spoil material. The Plan should indicate where the spoil will occur and methods and	Contractor	Part of the CEMP costs.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
		locations for disposal.		
Health and Safety	Worker health and safety	A Health and Safety Plan shall be prepared. The Plan shall include a Safety Training Program.	Contractor	Part of the CEMP costs.
Permits	General environmental pollution	Prior to the start of construction, the Contractor shall be responsible for ensuring that all environmental related permits listed in Section 2 of this EIA are in-hand and have been reviewed by the CSC.	Contractor	Part of general construction costs.
Construction Phase				
Soils	Soil erosion	The Contractor will be responsible for ensuing material that is less susceptible to erosion will be selected for placement around bridges and culverts. In addition he shall ensure re-vegetation of exposed areas including: • Selection of fast growing and grazing resistant species of local grasses and shrubs. • Immediate re-vegetation of all slopes and embankments if not covered with gabion baskets. • Placement of fiber mats to encourage vegetation growth.	Contractor	Part of general construction costs.
	Temporary land use.	Construction camps, staging areas and temporary storage, shall not be located on agricultural or private lands without the express permission of the landowner.	Contractor to ensure correct siting. CSC, ARS and MENR to approve.	None

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
	Soil compaction	The Contractor should endeavor to confine operation of heavy equipment within the RoW, as much as possible.	Contractor	Part of general construction costs.
		In case private lands are disturbed, the contractor should promptly inform the owner and agree on the ways to remedy the situation.	Contractor	Part of general construction costs.
	Spills and leaks of hazardous liquids	The Contractor shall ensure that: • All fuel and chemical storage (if any) shall be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks. • The construction camp maintenance yard shall be constructed on impervious hard standing with adequate drainage to collect spills, there shall be no vehicle maintenance activities on open ground. • Filling and refueling shall be strictly controlled and subject to formal procedures. Drip pans shall be placed under all filling and fueling areas. Waste oils shall be stored and disposed of by a licensed contractor. • All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use. • The contents of any tank or drum shall be clearly marked.	Contractor	Part of general construction costs.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
		Measures shall be taken to ensure that no contaminated discharges enter any soils. • No bitumen drums or containers, full or used, shall be stored on open ground. They shall only be stored on impervious hard standing. • Areas using bitumen shall be constructed on impervious hard standing to prevent seepage of oils into the soils.		
Air Quality	General construction emissions	The Contractor shall be responsible for the following; • *Exhaust emissions* - No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the CSC. Construction equipment shall be maintained to a good standard and fitted with pollution control devices regularly monitored by the Contractor. • *Open burning of waste materials* - No burning of debris or other materials will occur on the Site without permission of the CSC. *Dust generated from haul roads, unpaved roads, material stock piles, etc* - The Contractor shall ensure and that material stockpiles shall be located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne. All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from	Contractor	Part of general construction costs.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
		falling from or being blown off the vehicle(s). Hard surfaces will be required in construction areas with regular movements of vehicles. Effective use of water sprays will be implemented (e.g., all roads within the construction areas of the Site shall be sprayed at least twice each day during days of no rainfall, and more if necessary to control dust).		
	Emissions from new ancillary facilities	Any new borrow pits and asphalt mixing plant shall be the subject of separate environmental application under the responsibility of the Contractor.	Contractor	Part of general construction costs.
Hydrology	Drainage and Irrigation channels	During the construction phase the Contractor is required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works. The Contractors shall arrange with the village representatives those works which might interfere with the flow of irrigation waters to be carried out at such times as will cause the least disturbance to irrigation operations. Should any operation being performed by the Contractor interrupt existing irrigation facilities, the Contractors shall restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption.	Contractor	Part of general construction costs.
		The Contractor shall ensure: • Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at	Contractor	Part of general construction

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
		a location and in a manner that will cause neither pollution nor nuisance. • No extraction of water from any of the wetlands identified in Tables 4-1 and 4-2 shall occur during the course of construction works. • There shall be no direct discharge of sanitary or wash water to surface water, including the Kur River or any of the Wetlands listed in Tables 4-1 & 4-2. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited. • Liquid material storage containment areas shall not drain directly to surface water. • Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area. • Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters. • Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge. • Provide a wash pit or a wheel washing and/or vehicle		costs.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
		cleaning facility at the exits from the sites • Spill clean up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage: – Fueling operations shall occur only within containment areas. – All fuel and chemical storage (if any) shall be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks. – Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids. – All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use. – The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses. – Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will		

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
		be prohibited. – Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized to dispose of hazardous waste.		
Fauna	Impacts to protected species	Ensure that all of the measures outlined in Table 5-3 are implemented.	Contractor	Part of general construction costs.
	Impacts to nesting birds	To avoid direct damage to the nests and mortality of birds it is important to restrict the tree cutting process within breeding their period (May to July).	Contractor	Part of general construction costs.
	Tree Cutting	Maintenance of trees for a period of six months after planting.	Contractor	15,000
Borrow pits	General borrow pit impacts	Before the materials extraction the layer of top soil (about 20 cm) shall be removed to the side of excavation area and kept until the area exploitation will be finalized. Top soil stockpiles shall be located at least 50 meters distance from any watercourses to avoid water siltation and obstruction. The height of stockpiles shall not exceed three meters to avoid wind erosion and dust emissions.	Contractor	Part of general construction costs.
		Prior to material extraction activity environmental training shall be provided to the Contractors workers, drivers and equipment operators. Plants collection, hunting or/and	Contractor	Part of general construction

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
		trapping of animals by workers shall be strictly prohibited.		costs.
		The Contractor shall take responsibility to provide an access road to the borrow site and all drivers shall be instructed to use only this officially designated road. This will help to avoid additional soil compaction and disturbance to the local fauna species.	Contractor	Part of general construction costs.
		Full site reinstatement shall be undertaken to avoid landscape damage and habitat loss. Rehabilitation measures shall include: removing of all types of equipment from the site; removing of all types of waste or/and polluted soil and materials if any exist; slops grade reduction with use of unsuitable stockpiles and uncrushed rocks and; slope stabilization measure such as re-covering with top soil, and further seeding, grassing and planting of appropriate bushes or/and trees if reasonable.	Contractor	Part of general construction costs.
		The Borrow haul routes should follow established transport corridors/rights-of-way, to the extent that is practicable.	Contractor	Part of general construction costs.
Infrastructure	Impacts to roads	To mitigate the potential impacts: • Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions; • Allow for adequate traffic flow around construction areas;	Contractor	Part of general construction costs.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
		• Provide adequate signalization, appropriate lighting, well-designed traffic safety signs, barriers and flag persons for traffic control; and • Provide temporary access where accessibility is temporarily restricted due to civil works		
	Impacts to utilities	During construction all power lines and gas pipes in the Project Corridor shall be kept operational, this will include temporary transmission lines while existing poles and lines are moved.	Contractor	Part of general construction costs.
Waste Management	General construction waste	To mitigate the potential impacts: • Where possible, surplus materials will be reused or recycled. • Oils, fuels and chemicals (including bitumen, bridge deck waterproofing agents and concrete) are substances which are hazardous to human health. They need to be stored properly in correctly labeled containers. • Bitumen, oil and fuel should be stored in tanks with lined bunds to contain spillage. • Appropriate agreements should be made so that waste oils, fuels and chemicals are disposed of at the licensed hazardous waste disposal sites.	Contractor	Part of general construction costs.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
		In the absence of functioning sewerage and sewage treatment facilities in most of Azerbaijan, it is recommended that the Contractor is required to provide his own on-site wastewater treatment facilities. For sites servicing a small number of employees (less than 150), septic tanks may be used. For larger sites, liquid wastes should as a minimum receive primary treatment in anaerobic tank or pond preceded by a bar screen to remove large solid objects (e.g. sticks, rags). There will be no direct discharge of untreated sanitary or oily wastewater to surface water bodies.	Contractor	Part of general construction costs.
Socio-economics	Impacts to labour	Whenever possible, employ local labor to benefit local communities and to promote the overall acceptance of the project.	Contractor	Part of general construction costs.
Health and Safety	Access	Provide safe access through the construction site to people whose residences/shelters and routes are temporarily severed by road construction.	Contractor	Part of general construction costs.
	Worker health and safety	• Safety Meetings. Regular safety meetings will be conducted on a monthly basis and shall require attendance by the safety representatives of Subcontractors unless otherwise agreed by the CSC. • Safety Inspections. The Contractor shall regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding	Contractor	Part of general construction costs.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
		equipment. Lights and signs shall be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately. • Safety Equipment and Clothing. Safety equipment and protective clothing are required to be available on the Site at all material times and measures for the effective enforcement of proper utilization and necessary replacement of such equipment and clothing, and all construction plant and equipment used on or around the Site shall be fitted with appropriate safety devices. These shall include but not be limited to: – Effective safety catches for crane hooks and other lifting devices, and – Functioning automatic warning devices and, where applicable, an up-to-date test certificate, for cranes and hoists.		
	STDs	Subcontract with an Approved Service Provider to provide an HIV Awareness Program to the Contractor's Personnel and the Local Community as soon as practicable after the Contractor's Personnel arrive at the Site but in any case within two weeks after the Contractor's Personnel arrive at Site and to repeat the HIV Awareness Program at intervals not exceeding four months.	Contractor	Part of general construction costs.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
Cultural Heritage	Chance Finds	To mitigate impacts to cultural resources in the event of a chance find the following procedures shall apply: • If a monument is found during any construction or other works, the works should be immediately stopped and relevant authorities (Ministry of Culture) and Azerbaijan Science Academy taking into consideration expert evaluation. • If construction or other works are conducted in the area of historical or archeological importance, this area is initially examined by experts and initial inspection of monuments is provided. Relevant authorities (Ministry of Culture) provide participation of their representative or expert in the construction site.	Contractor	Part of general construction costs.
Noise	General construction noise	The following mitigation measures shall be applied: • Source Controls, i.e., requirements that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken; • Site Controls, i.e., requirements that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible; • Work near Sensitive Receptors shall be limited to short term activities. • No asphalt plants, rock crushing plants or any long term	Contractor	Part of general construction costs.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)
		generators of significant noise shall be allowed within 500 meters of sensitive receptors; • Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the site CSC having due regard for possible noise disturbance to the local residents or other activities. • Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. • When operating close to sensitive areas such as residential, nursery, or medical facilities, the Sub-Contractor's hours of working shall be limited to 8 AM to 6 PM; • Community Awareness, i.e., public notification of construction operations will incorporate noise considerations; methods to handle complaints will be specified. Sensitive receptors will be avoided as possible (i.e., aggregate crushers, operators, etc.).		
Operational Phase				
Socio-economics	Impacts to labour	As part of the maintenance of the road the ARS should look into the possibility of employing the local people for the maintenance of roadside drains upon completion of rehabilitation works.	ARS	TBD

Table 6-2: Environmental Monitoring Plan – R45 & R46

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		Design				
Climate Change	More extreme flood events	Ensure designers include appropriate embankment height and drainage measures to account for potentially more regular and more intense flood events.	Review and approve Designs	ARS	Once, prior to Pre-construction	Included within the general tasks of PIU.
Hydrology	Poor design of drainage	Review designs of drainage and culverts to ensure that drainage patterns are improved from the existing conditions and that increased run-off does not occur or result in flooding of areas previously undisturbed.	Review and approve Designs	ARS	Once, prior to Pre-construction phase	Included within the general tasks of PIU.
		During design, all drainage works shall be designed based on the historical flood data and flood forecasting.	Review and approve Designs	ARS	Once, prior to Pre-construction phase	Included within the general tasks of PIU.
		A design discharge of 50 years return period shall be considered for culverts, and 100 years of bridges.	Review and approve Designs	ARS	Once, prior to Pre-construction phase	Included within the general tasks of PIU.
Flora	Tree cutting	Compensation for the tree owners shall be according to the requirements set out in Item 5.5.1.2.	Review compensation payments.	CSC	Once, prior to construction phase	Included within the tasks of PIU Safeguards

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
						Specialist.
Fauna	Impacts to Livestock	As animal husbandry is the main agricultural activity at the area, one livestock underpass shall be designed within 500 m distance (before or after) of each village.	Review and approve Designs	ARS	Once, prior to Pre-construction phase	Included within the tasks of PIU Safeguards Specialist.
		The design shall provide speed limitation measures (traffic regulation signs, speed humps etc.) within residential sections.	Review and approve Designs	ARS	Once, prior to Pre-construction phase	Included within the tasks of PIU Safeguards Specialist.
	Impacts to protected species	The designs shall ensure that all of the measures outlined in Table 5-3 are implemented.	Review and approve Designs	ARS	Once, prior to Pre-construction phase	Included within the tasks of PIU Safeguards Specialist.
Health and Safety	Road accidents.	To ensure public safety the designs shall include safety barriers and marking of hazardous areas in accordance with Safety Regulations for Construction, Rehabilitation and Maintenance, 1978.	Review and approve Designs	ARS	Once, prior to Pre-construction phase	Included within the tasks of PIU Safeguards Specialist.
Noise	Elevated traffic	To ensure operational noise levels are assessed correctly the following	Review and approve	ARS	Once, prior to Pre-construction	Included within the tasks of PIU

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
	noise.	recommendations are made: • Prepare traffic counts during this phase of the Project. • Undertake noise modeling based on detailed designs (which clearly show the distance and height of urban dwellings from the road side) and the results of the traffic counts, and other environmental information, such as climate and wind directions. • Assess which areas of the Project Corridor will be subjected to noise levels elevated above Azerbaijani noise standards during the operational phase of the Project (based on projections in 5 and ten years time). • Based on the results of the noise modeling exercise prepare designs for noise barriers where noise levels are anticipated to be exceeded within the Project Corridor. • The design specifications shall be included in the Bill of Quantities (BoQ) supplied to potential Contractors during the construction contract bidding stage	Designs, noise modeling results, BoQ and Contractors Contract.		phase	Safeguards Specialist.

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		of the Project. • The noise barrier design requirements and locations shall also be included in the Contractors contract.				
Pre-Construction Phase						
Air Quality		No asphalt plant shall be located within 500 meters of any urban area, protected area or sensitive receptor.	Review and approve locations.	MENR, CSC and ARS	Once, prior to construction phase	Included as PIU Safeguards Specialist tasks and CSCs Environmental Specialists costs.
		The Contractor shall be responsible for the preparation of an Air Quality Plan	Review and approval of Plan.	CSC	Once, prior to construction phase	Included as CSCs Environmental Specialists cost.
Soils	Permanent loss of land.	Before the commencement of the construction works of the Project at any road the Land Acquisition and Resettlement Plan (the LARP) must be prepared and approval obtained from the World Bank.	Review and approval of Plan.	World Bank	Once, prior to construction phase	None

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
	Spills and leaks of liquids	The Contractor will be responsible for preparation of an Emergency Response Plan (ERP).	Review and approval of Plan.	CSC	Once, prior to construction phase	Included as CSCs Environmental Specialists cost.
Hydrology	Impacts to hydrology from Construction Camps	The Contractor shall be responsible for the preparation of a Construction Camp Site Plan.	Review and approval of Plan.	CSC	Once, prior to construction phase	Included as CSCs Environmental Specialists cost.
Flora	Tree Cutting	Monitor tree cutting to ensure correct numbers and locations.	Site visit to count numbers of trees cut.	CSC	Once, prior to construction phase	Included as CSCs Environmental Specialists cost.
Fauna	Impacts to wildlife	The location of permanent structures shall be at least 500 m away from the Kur River bank and any of the Wetlands listed in Tables 4-1 and 4-2 of this report.	Review and approve locations	MENR, CSC and ARS	Once, prior to construction phase	Included as PIU Safeguards Specialist tasks and CSCs Environmental Specialists cost.

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		Demolishing of existing structures (houses, barns and any other) shall be avoided. Where this is unavoidable surveys of the properties shall be undertaken prior to demolition to ensure that no animals and birds will be affected.	Ensure all surveys have been undertaken by the Contractor.	CSC	Once, prior to construction phase	Included as CSCs Environmental Specialists cost.
	Impacts to protected species	The Contractor shall ensure that all of the measures outlined in Table 5-3 are implemented.	Review requirements of Table 5-3 with Contractor.	CSC	Once, prior to construction phase	Included as CSCs Environmental Specialists cost.
Borrow Pits	General impacts from borrow pits	Prepare a Borrow Pit Action Plan (BAP).	Review and approval of Plan.	CSC	Once, prior to construction phase	Included as CSCs Environmental Specialists cost.
Infrastructure	Impacts to traffic and roads	Prepare and submit a Traffic Management Plan to local traffic authorities prior to mobilization.	Review and approval of Plan.	CSC	Once, prior to construction phase	Included as CSCs Environmental Specialists cost.
Waste Managem	General impacts	Preparation of a Waste Management and Recycling Plan.	Review and approval of	CSC	Once, prior to construction	Included as CSCs

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
ent	from waste		Plan prior to construction.		phase	Environmental Specialists cost.
Health and Safety	Worker health and safety	A Health and Safety Plan shall be prepared.	Review and approval of Plan.	CSC	Once, prior to construction phase	Included as CSCs Environmental Specialists cost.
Permits	General environmental pollution	Ensure that all environmental related permits listed in Section 2 of this EIA are in-hand and have been reviewed by the CSC.	Review of all Permits.	CSC	Once, prior to construction phase	Included as CSCs Environmental Specialists cost.
Construction Phase						
Soils	Soil erosion	Review site activities to ensure Contractor is using material that is less susceptible to erosion around bridges and culverts and that re-vegetation of exposed areas includes: • Selection of fast growing and grazing resistant species of local grasses and shrubs. • Immediate re-vegetation of all slopes and embankments if not covered with gabion	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		baskets. • Placement of fiber mats to encourage vegetation growth.				
	Temporary land use.	Ensure construction camps, staging areas and temporary storage, are not located on agricultural or private lands without the express permission of the landowner.	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.
	Soil compaction	Does the Contractor endeavor to confine operation of heavy equipment within the RoW, as much as possible.	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.
		Assess if any private lands have been disturbed and if so, has the contractor	Observational monitoring	Contractor & CSC	• Daily site monitoring by	Included as Contractors

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		promptly informed the owner and agreed on the ways to remedy the situation.	and reporting using the Environmental Checklist (Appendix E), or similar		Contractor • Weekly site monitoring by CSC	Environmental Manager and CSCs Environmental Specialist mitigation costs.
	Spills and leaks of hazardous liquids	Has the Contractor ensured that: • All fuel and chemical storage (if any) is sited on an impervious base within a bund and secured by fencing. • The storage area is located away from any watercourse or wetlands. • The base and bund walls shall are impermeable and of sufficient capacity to contain 110 percent of the volume of tanks. • The construction camp maintenance yard is constructed on impervious hard standing with adequate drainage to collect spills, and there is no vehicle maintenance activities on open ground. • Filling and refueling is strictly controlled and subject to formal procedures. • Drip pans are placed under all filling and fueling areas. • Waste oils are stored and disposed of by	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		a licensed contractor. • All valves and trigger guns are resistant to unauthorized interference and vandalism and are turned off and securely locked when not in use. • The contents of any tank or drum is clearly marked. • Measures have been taken to ensure that no contaminated discharges enter any soils. • No bitumen drums or containers, full or used, are stored on open ground. They are only stored on impervious hard standing. • Areas using bitumen are constructed on impervious hard standing to prevent seepage of oils into the soils.				
Air Quality	General construction emissions	Has the Contractor ensured that: • *Exhaust emissions* - No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants has been installed without prior written consent of the CSC. • Construction equipment is maintained to a good standard and fitted with pollution	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		control devices and regularly monitored by the Contractor. • *Open burning of waste materials* - No burning of debris or other materials is occuring on the Site without permission of the CSC. • *Dust generated from haul roads, unpaved roads, material stock piles, etc* - material stockpiles are located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne. • All trucks used for transporting materials to and from the site are covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s). • Hard surfaces are provided in construction areas with regular movements of vehicles. • Effective use of water sprays is implemented (e.g., all roads within the construction areas of the Site shall be				costs.

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		sprayed at least twice each day during days of no rainfall, and more if necessary to control dust).				
	Emissions from new ancillary facilities	Any new borrow pits and asphalt mixing plant have been the subject of separate environmental application under the responsibility of the Contractor.	Review and approval of application.	CSC	• Once, prior to start of works at the new site.	Included as CSCs Environmental Specialists cost.
Hydrology	Drainage and Irrigation channels	The Contractor has constructed, maintained, removed and reinstated as necessary temporary drainage works and taken all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works. The Contractors has arranged with the village representatives those works which might interfere with the flow of irrigation waters to be carried out at such times as will cause the least disturbance to irrigation operations. Should any operation being performed by the Contractor interrupt existing irrigation facilities, the Contractors has restored the irrigation appurtenances to their original working conditions within 24 hours of being	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		notified of the interruption.				
		Has the Contractor ensured that: • Wastewater arising on the site has been collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance. • No extraction of water from any of the wetlands identified in Tables 4-1 and 4-2 has occured during the course of construction works. • There has been no direct discharge of sanitary or wash water to surface water, including the Kur River or any of the Wetlands listed in Tables 4-1 & 4-2. • Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies has been prohibited. • Liquid material storage containment areas do not drain directly to surface water. • Lubricating and fuel oil spills have been	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		cleaned up immediately. • Construction and work sites are equipped with sanitary latrines that do not pollute surface waters. • Discharge of sediment-laden construction water directly into surface watercourses does not occur. • Sediment laden construction water is not discharged into settling lagoons or tanks prior to final discharge. • A wash pit or a wheel washing and/or vehicle cleaning facility has been constructed at the exits from the sites. • Spill clean up equipment is maintained on site. • Fueling operations occur only within containment areas. • All fuel and chemical storage (if any) are sited on an impervious base within a bund and secured by fencing. • The storage area is located away from				

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		any watercourse or wetlands. • The base and bund walls is impermeable and of sufficient capacity to contain 110 percent of the volume of tanks. • Filling and refueling is strictly controlled and subject to formal procedures and takes place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids. • All valves and trigger guns are resistant to unauthorized interference and vandalism and can be turned off and securely locked when not in use. • The contents of any tank or drum are clearly marked. • Measures have been taken to ensure that no contaminated discharges enter any drain or watercourses. • Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies is prohibited. • If any accidental spills occur immediate clean up has been undertaken and all cleanup materials stored in a secure area				

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		for disposal to a site authorized to dispose of hazardous waste.				
Fauna	Impacts to protected species	All of the measures outlined in Table 5-3 have been implemented.	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.
	Impacts to nesting birds	Restrict the tree cutting process within the breeding period (May to July).	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
	Tree Cutting	Maintain trees for a period of six months after planting.	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.
Borrow pits	General borrow pit impacts	Ensure that before the materials extraction the layer of top soil (about 20 cm) shall be removed to the side of excavation area and kept until the area exploitation will be finalized. Top soil stockpiles are located at least 50 meters distance from any watercourses to avoid water siltation and obstruction. The height of stockpiles does not exceed three meters to avoid wind erosion and dust emissions.	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		Prior to material extraction activity environmental training has been provided to the Contractors workers, drivers and equipment operators. Plant collection, hunting or/and trapping of animals by workers is strictly prohibited.	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.
		Full site reinstatement has been undertaken to avoid landscape damage and habitat loss. Rehabilitation measures have included: removing of all types of equipment from the site; removing of all types of waste or/and polluted soil and materials if any exist; slops grade reduction with use of unsuitable stockpiles and uncrushed rocks and; slope stabilization measure such as re-covering with top soil, and further seeding, grassing and planting of appropriate bushes or/and trees if reasonable.	Review status of borrow pit against the reinstatement process in the Contractors approved borrow pit plan.	CSC	Once, on completion of works in the borrow pit.	Included as CSCs Environmental Specialist mitigation costs.
		Borrow haul routes follow established transport corridors/rights-of-way, to the extent	Observational monitoring	Contractor & CSC	• Daily site monitoring by	Included as Contractors

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		that is practicable.	and reporting using the Environmental Checklist (Appendix E), or similar		Contractor • Weekly site monitoring by CSC	Environmental Manager and CSCs Environmental Specialist mitigation costs.
Infrastructure	Impacts to roads	Has the Contractor: • Provided information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions; • Allowed for adequate traffic flow around construction areas; • Provided adequate signalization, appropriate lighting, well-designed traffic safety signs, barriers and flag persons for traffic control; and • Provided temporary access where accessibility is temporarily restricted due to civil works	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.
	Impacts to utilities	During construction all power lines and gas pipes in the Project Corridor have been kept operational, including temporary transmission lines while existing poles and lines are moved.	Observational monitoring and reporting using the	Contractor & CSC	• Daily site monitoring by Contractor	Included as Contractors Environmental Manager and

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
			Environmental Checklist (Appendix E), or similar		• Weekly site monitoring by CSC	CSCs Environmental Specialist mitigation costs.
Waste Management	General construction waste	Has the Contractor ensured that: • Where possible, surplus materials have been reused or recycled. • Oils, fuels and chemicals (including bitumen, bridge deck waterproofing agents and concrete) are stored properly in correctly labeled containers. • Bitumen, oil and fuel are stored in tanks with lined bunds to contain spillage. • Appropriate agreements have been made so that waste oils, fuels and chemicals are disposed of at the licensed hazardous waste disposal sites.	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.
		The Contractor has provided his own on-site wastewater treatment facilities. There is no direct discharge of untreated sanitary or oily wastewater to surface water	Observational monitoring and reporting using the Environment	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site	Included as Contractors Environmental Manager and CSCs

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		bodies.	al Checklist (Appendix E), or similar		monitoring by CSC	Environmental Specialist mitigation costs.
Health and Safety	Access	Safe access through the construction site is provided to people whose residences/shelters and routes are temporarily severed by road construction.	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.
	Worker health and safety	Has the Contractor ensured that: • Regular safety meetings are conducted on a monthly basis. • The Contractor regularly inspects, tests and maintains all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. • Lights and signs are kept clear of obstructions and legible to read. • Equipment, which is damaged, dirty,	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		incorrectly positioned or not in working order, has been repaired or replaced immediately. • Safety equipment and protective clothing are available on the Site at all times for the effective enforcement of proper utilization and necessary replacement of such equipment and clothing, and all construction plant and equipment used on or around the Site is fitted with appropriate safety devices. These shall include but not be limited to: – Effective safety catches for crane hooks and other lifting devices, and – Functioning automatic warning devices and, where applicable, an up-to-date test certificate, for cranes and hoists.				
	STDs	The Contractor has a Subcontract with an Approved Service Provider to provide an HIV Awareness Program to the Contractor's Personnel.	Periodic review of training program	CSC	Once every three months	

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
Cultural Heritage	Chance Finds	Has the Contractor ensured that: • If a monument is found during any construction or other works, the works have immediately stopped and relevant authorities (Ministry of Culture) and Azerbaijan Science Academy taking into consideration expert evaluation. • If construction or other works are conducted in the area of historical or archeological importance, this area has been initially examined by experts and initial inspection of monuments provided.	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.
Noise	General construction noise	Has the Contractor ensured that: • Source Controls, i.e., all exhaust systems are maintained in good working order; properly designed engine enclosures and intake silencers are employed; and regular equipment maintenance is undertaken; • Site Controls, i.e., requirements that stationary equipment is placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible;	Observational monitoring and reporting using the Environmental Checklist (Appendix E), or similar	Contractor & CSC	• Daily site monitoring by Contractor • Weekly site monitoring by CSC	Included as Contractors Environmental Manager and CSCs Environmental Specialist mitigation costs.

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		• Work near Sensitive Receptors is limited to short term activities. • No asphalt plants, rock crushing plants or any long term generators of significant noise is located within 500 meters of sensitive receptors; • Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and work days is limited to less noise-sensitive times. Hours-of-work are approved by the site CSC having due regard for possible noise disturbance to the local residents or other activities. • Construction activities are strictly prohibited between 10 PM and 6 AM in the residential areas. • When operating close to sensitive areas such as residential, nursery, or medical facilities, the Sub-Contractor's hours of working is limited to 8 AM to 6 PM; • Community Awareness, i.e., public notification of construction operations incorporates noise considerations; methods to handle complaints have				

Item	Impact	Requirement	Monitoring Methods and Parameters	Monitoring Responsibility	Monitoring Frequency	Monitoring Costs
		been specified. Sensitive receptors are avoided as far as possible (i.e., aggregate crushers, operators, etc.).				

Table 6-3: Environmental Mitigation and Monitoring Plan – Local Roads

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
Design Phase						
Climate Change	More extreme flood events	The Designers shall consider the potential for current and future flood events within the Project area and establish an appropriate embankment height and drainage measures to account for potentially more regular and more intense flood events.	Design Consultant	Included in design costs.	Review and approve Designs prior to Pre-construction phase	ARS
Hydrology	Poor design of drainage	Consideration in the design phase will be given by the Design Consultant to the issue of drainage and culverts to ensure that drainage patterns are improved from the existing conditions and that increased run-off does not occur or result in flooding of areas previously undisturbed.	Design Consultant	Included in design costs.	Review and approve Designs prior to Pre-construction phase	ARS
		During design, all drainage works shall be designed based on the historical flood data	Design Consultant	Included in design costs.	Review and approve Designs	ARS

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		and flood forecasting.			prior to Pre-construction phase	
		A design discharge of 50 years return period shall be considered for culverts, and 100 years of bridges.	Design Consultant	Included in design costs.	Review and approve Designs prior to Pre-construction phase	ARS
Flora	Tree cutting	ARS PIU shall calculate numbers of trees to be cut based on surveys.	ARS PIU	500	None	None
		Compensation for the tree owners shall be according to the requirements set out in Item 5.5.1.2.	MENR to undertake financial calculations. ARS PIU to pay compensation. Contractor to cut trees.	25,000 (based on preliminary calculations).	Review compensation payments. Monitor tree cutting to ensure correct numbers and locations.	CSC

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
Fauna	Impacts to Livestock	The design shall provide speed limitation measures (traffic regulation signs, speed humps etc.) within residential sections.	Design Consultant	Included in design costs.	Review and approve Designs prior to Pre-construction phase	ARS
	Impacts to protected species	The designs shall ensure that all of the measures outlined in Table 5-3 are implemented.	Design Consultant	Included in design costs.	Review and approve Designs prior to Pre-construction phase.	ARS
Health and Safety	Road accidents.	To ensure public safety the designs shall include safety barriers and marking of hazardous areas in accordance with Safety Regulations for Construction, Rehabilitation and Maintenance, 1978.	Design Consultant	Included in design costs.	Review and approve Designs prior to Pre-construction phase.	ARS
Pre-Construction Phase						
Air Quality	Dust from construction camps and borrow pits	Contractors locations for borrow pits, rock crushing facilities and asphalt plants shall require approval from the CSC, ARS PIU and MENR during the Pre-construction phase.	CSC, ARS and MENR to approve locations.	None	None	None
		No asphalt plant shall be located within 500 meters of any urban area, protected area or sensitive receptor.	Contractor to ensure correct siting.	None	Review and approve locations	MENR, CSC and ARS

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		The Contractor shall be responsible for the preparation of an Air Quality Plan	Contractor	Part of the CEMP costs.	Review and approval of Plan prior to construction.	CSC
Soils	Spills and leaks of liquids	The Contractor will be responsible for preparation of an Emergency Response Plan (ERP) which will cover containment of hazardous materials, oil spills, and work-site accidents	Contractor	Part of the CEMP costs.	Review and approval of Plan prior to construction.	CSC
Hydrology	Impacts to hydrology from Construction Camps	The Contractor shall be responsible for the preparation of a Construction Camp Site Plan which will form part of the CEMP. The Plan shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. No construction camp, either temporary or permanent, shall be located within 500 meters of the Kur River or any of the Wetlands listed in Tables 4-1 and 4-2.	Contractor	Part of the CEMP costs.	Review and approval of Plan prior to construction.	CSC
Fauna	Impacts to wildlife	The location of permanent structures shall be at least 500 m away from the Kur River bank and any of the Wetlands listed in Tables 4-1 and 4-2 of this report.	Contractor to ensure correct siting.	None	Review and approve locations	MENR, CSC and ARS

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
	Impacts to protected species	The Contractor shall ensure that all of the measures outlined in Table 5-3 are implemented.	Contractor	Part of general construction costs.	Review requirements of Table 5-3 with Contractor before start of construction.	CSC
Borrow Pits	General impacts from borrow pits	Prepare a Borrow Pit Action Plan (BAP). The plan will identify the locations of all proposed borrow pits taking into account the recommendations of this report. The plan shall ensure that: • Pit restoration will follow the completion of works in full compliance all applicable standards and specifications. • Arrangements for opening and using material borrow pits will contain enforceable provisions. • The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the CSC will be required before final acceptance and payment under the terms of contracts. • Additional borrow pits will not be opened without the restoration of those areas no longer in use.	Contractor	Part of the CEMP costs.	Review and approval of Plan prior to construction.	CSC
Infrastructu	Impacts to traffic and	Prepare and submit a Traffic Management Plan to local traffic authorities prior to	Contractor	Part of the	Review and approval of Plan	CSC

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
re	roads	mobilization.		CEMP costs.	prior to construction.	
Waste Management	General impacts from waste	Preparation of a Waste Management and Recycling Plan. The Plan shall include items relating to the safe handling and management of Domestic waste, Food waste, Inert garbage, Recycled Waste, Plastic, Metals, Wood, Construction Waste, Hazardous Waste and Liquid Waste. The Plan will also include provisions to manage all excess spoil material. The Plan should indicate where the spoil will occur and methods and locations for disposal.	Contractor	Part of the CEMP costs.	Review and approval of Plan prior to construction.	CSC
Health and Safety	Worker health and safety	A Health and Safety Plan shall be prepared. The Plan shall include a Safety Training Program.	Contractor	Part of the CEMP costs.	Review and approval of Plan prior to construction.	CSC
Permits	General environmental pollution	Prior to the start of construction, the Contractor shall be responsible for ensuring that all environmental related permits listed in Section 2 of this EIA are in-hand and have been reviewed by the CSC.	Contractor	Part of general construction costs.	Review of all Permits prior to construction.	CSC
Construction Phase						
Soils	Soil erosion	The Contractor will be responsible for ensuing material that is less susceptible to erosion will	Contractor	Part of general	• Daily site	• Daily monitoring

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		be selected for placement around bridges and culverts. In addition he shall ensure re-vegetation of exposed areas including: • Selection of fast growing and grazing resistant species of local grasses and shrubs. • Immediate re-vegetation of all slopes and embankments if not covered with gabion baskets. • Placement of fiber mats to encourage vegetation growth.		construction costs.	monitoring • Weekly site monitoring	by the Contractor • Weekly monitoring by the CSC.
	Temporary land use.	Construction camps, staging areas and temporary storage, shall not be located on agricultural or private lands without the express permission of the landowner.	Contractor to ensure correct siting. CSC, ARS and MENR to approve.	None	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.
	Soil compaction	The Contractor should endeavor to confine operation of heavy equipment within the RoW, as much as possible.	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
						monitoring by the CSC.
		In case private lands are disturbed, the contractor should promptly inform the owner and agree on the ways to remedy the situation.	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.
	Spills and leaks of hazardous liquids	The Contractor shall ensure that: • All fuel and chemical storage (if any) shall be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks. • The construction camp maintenance yard shall be constructed on impervious hard standing with adequate drainage to collect spills, there shall be no vehicle maintenance activities on open ground.	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		• Filling and refueling shall be strictly controlled and subject to formal procedures. Drip pans shall be placed under all filling and fueling areas. Waste oils shall be stored and disposed of by a licensed contractor. • All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use. • The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any soils. • No bitumen drums or containers, full or used, shall be stored on open ground. They shall only be stored on impervious hard standing. • Areas using bitumen shall be constructed on impervious hard standing to prevent seepage of oils into the soils.				
Air Quality	General construction emissions	The Contractor shall be responsible for the following; • *Exhaust emissions* - No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the CSC. Construction equipment shall	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		be maintained to a good standard and fitted with pollution control devices regularly monitored by the Contractor. • *Open burning of waste materials* - No burning of debris or other materials will occur on the Site without permission of the CSC. • *Dust generated from haul roads, unpaved roads, material stock piles, etc* - The Contractor shall ensure and that material stockpiles shall be located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne. All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s). Hard surfaces will be required in construction areas with regular movements of vehicles. Effective use of water sprays will be implemented (e.g., all roads within the construction areas of the Site shall be sprayed at least twice each				CSC.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		day during days of no rainfall, and more if necessary to control dust).				
	Emissions from new ancillary facilities	Any new borrow pits and asphalt mixing plant shall be the subject of separate environmental application under the responsibility of the Contractor.	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.
Hydrology	Drainage and Irrigation channels	During the construction phase the Contractor is required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works. The Contractors shall arrange with the village representatives those works which might interfere with the flow of irrigation waters to be carried out at such times as will cause the least disturbance to irrigation operations. Should any operation being performed by the Contractor interrupt existing irrigation facilities, the Contractors shall restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption.	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		The Contractor shall ensure: • Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance. • No extraction of water from any of the wetlands identified in Tables 4-1 and 4-2 shall occur during the course of construction works. • There shall be no direct discharge of sanitary or wash water to surface water, including the Kur River or any of the Wetlands listed in Tables 4-1 & 4-2. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited. • Liquid material storage containment areas shall not drain directly to surface water. • Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		up shall be materials be maintained at the storage area. • Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters. • Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge. • Provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites • Spill clean up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage: – Fueling operations shall occur only within containment areas. – All fuel and chemical storage (if any) shall be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse				

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks. – Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids. – All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use. – The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses. – Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited. – Should any accidental spills occur				

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized to dispose of hazardous waste.				
Fauna	Impacts to protected species	Ensure that all of the measures outlined in Table 5-3 are implemented.	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.
	Impacts to nesting birds	To avoid direct damage to the nests and mortality of birds it is important to restrict the tree cutting process within breeding their period (May to July).	Contractor	Part of general construction costs.	• Daily site monitoring during the breeding period • Weekly site monitoring during the breeding period	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.
	Tree Cutting	Maintenance of trees for a period of six months after planting.	Contractor	15,000	• Daily site monitoring	• Daily monitoring by the

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
					• Weekly site monitoring	Contractor • Weekly monitoring by the CSC.
Borrow pits	General borrow pit impacts	Before the materials extraction the layer of top soil (about 20 cm) shall be removed to the side of excavation area and kept until the area exploitation will be finalized. Top soil stockpiles shall be located at least 50 meters distance from any watercourses to avoid water siltation and obstruction. The height of stockpiles shall not exceed three meters to avoid wind erosion and dust emissions.	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.
		Prior to material extraction activity environmental training shall be provided to the Contractors workers, drivers and equipment operators. Plants collection, hunting or/and trapping of animals by workers shall be strictly prohibited.	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.
		The Contractor shall take responsibility to provide an access road to the borrow site	Contractor	Part of general	• Daily site monitoring	• Daily monitoring

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		and all drivers shall be instructed to use only this officially designated road. This will help to avoid additional soil compaction and disturbance to the local fauna species.		construction costs.	• Weekly site monitoring	by the Contractor • Weekly monitoring by the CSC.
		Full site reinstatement shall be undertaken to avoid landscape damage and habitat loss. Rehabilitation measures shall include: removing of all types of equipment from the site; removing of all types of waste or/and polluted soil and materials if any exist; slops grade reduction with use of unsuitable stockpiles and uncrushed rocks and; slope stabilization measure such as re-covering with top soil, and further seeding, grassing and planting of appropriate bushes or/and trees if reasonable.	Contractor	Part of general construction costs.	On completion of works in the borrow pit.	CSC
		The Borrow haul routes should follow established transport corridors/rights-of-way, to the extent that is practicable.	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
Infrastructure	Impacts to roads	To mitigate the potential impacts: • Provide information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions; • Allow for adequate traffic flow around construction areas; • Provide adequate signalization, appropriate lighting, well-designed traffic safety signs, barriers and flag persons for traffic control; and • Provide temporary access where accessibilty is temporarily restricted due to civil works	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.
	Impacts to utilities	During construction all power lines and gas pipes in the Project Corridor shall be kept operational, this will include temporary transmission lines while existing poles and lines are moved.	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
Waste Management	General construction waste	To mitigate the potential impacts: • Where possible, surplus materials will be reused or recycled. • Oils, fuels and chemicals (including bitumen, bridge deck waterproofing agents and concrete) are substances which are hazardous to human health. They need to be stored properly in correctly labeled containers. • Bitumen, oil and fuel should be stored in tanks with lined bunds to contain spillage. • Appropriate agreements should be made so that waste oils, fuels and chemicals are disposed of at the licensed hazardous waste disposal sites.	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.
		In the absence of functioning sewerage and sewage treatment facilities in most of Azerbaijan, it is recommended that the Contractor is required to provide his own on-site wastewater treatment facilities. For sites servicing a small number of employees (less than 150), septic tanks may be used. For larger sites, liquid wastes should as a minimum receive primary treatment in anaerobic tank or pond preceded by a bar screen to remove large solid objects (e.g. sticks, rags). There will	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		be no direct discharge of untreated sanitary or oily wastewater to surface water bodies.				
Socio-economics	Impacts to labour	Whenever possible, employ local labor to benefit local communities and to promote the overall acceptance of the project.	Contractor	Part of general construction costs.	None	None
Health and Safety	Access	Provide safe access through the construction site to people whose residences/shelters and routes are temporarily severed by road construction.	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.
	Worker health and safety	• Safety Meetings. Regular safety meetings will be conducted on a monthly basis and shall require attendance by the safety representatives of Subcontractors unless otherwise agreed by the CSC. • Safety Inspections. The Contractor shall regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting,	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		signing and guarding equipment. Lights and signs shall be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately. • Safety Equipment and Clothing. Safety equipment and protective clothing are required to be available on the Site at all material times and measures for the effective enforcement of proper utilization and necessary replacement of such equipment and clothing, and all construction plant and equipment used on or around the Site shall be fitted with appropriate safety devices. These shall include but not be limited to: – Effective safety catches for crane hooks and other lifting devices, and – Functioning automatic warning devices and, where applicable, an up-to-date test certificate, for cranes and hoists.				
	STDs	Subcontract with an Approved Service	Contractor	Part of	Periodic review of	CSC

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		Provider to provide an HIV Awareness Program to the Contractor's Personnel and the Local Community as soon as practicable after the Contractor's Personnel arrive at the Site but in any case within two weeks after the Contractor's Personnel arrive at Site and to repeat the HIV Awareness Program at intervals not exceeding four months.		general construction costs.	training program	
Cultural Heritage	Chance Finds	To mitigate impacts to cultural resources in the event of a chance find the following procedures shall apply: • If a monument is found during any construction or other works, the works should be immediately stopped and relevant authorities (Ministry of Culture) and Azerbaijan Science Academy taking into consideration expert evaluation. • If construction or other works are conducted in the area of historical or archeological importance, this area is initially examined by experts and initial inspection of monuments is provided. Relevant authorities (Ministry of Culture) provide participation of their representative or expert in the	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		construction site.				
Noise	General construction noise	The following mitigation measures shall be applied: • Source Controls, i.e., requirements that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken; • Site Controls, i.e., requirements that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible; • Work near Sensitive Receptors shall be limited to short term activities. • No asphalt plants, rock crushing plants or any long term generators of significant noise shall be allowed within 500 meters of sensitive receptors; • Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by	Contractor	Part of general construction costs.	• Daily site monitoring • Weekly site monitoring	• Daily monitoring by the Contractor • Weekly monitoring by the CSC.

Item	Impact	Mitigation	Responsibility	Mitigation Cost (USD)	Monitoring Requirement	Monitoring Responsibility
		the site CSC having due regard for possible noise disturbance to the local residents or other activities. • Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. • When operating close to sensitive areas such as residential, nursery, or medical facilities, the Sub-Contractor's hours of working shall be limited to 8 AM to 6 PM; • Community Awareness, i.e., public notification of construction operations will incorporate noise considerations; methods to handle complaints will be specified. Sensitive receptors will be avoided as possible (i.e., aggregate crushers, operators, etc.).				
Operational Phase						
Socio-economics	Impacts to labour	As part of the maintenance of the road the ARS should look into the possibility of employing the local people for the maintenance of roadside drains upon completion of rehabilitation works.	ARS	TBD	None	None

Table 6-3A: Environmental Management Plan – local roads

PART 1: GENERAL PROJECT AND SITE INFORMATION

INSTITUTIONAL & ADMINISTRATIVE				
Country				
Project title				
Scope of project and activity				
Institutional arrangements (Name and contacts)	WB (Project Team Leader)	Project Management	Local Counterpart and/or Recipient	
Implementation arrangements (Name and contacts)	Safeguard Supervision	Local Counterpart Supervision	Local Inspectorate Supervision	Contactor
SITE DESCRIPTION				
Name of site				
Describe site location			Attachment 1: Site Map [ ]Y [ ] N	
Who owns the land?				
Description of geographic, physical, biological, geological, hydrographic and				

socio-economic context	
Locations and distance for material sourcing, especially aggregates, water, stones?	
LEGISLATION	
Identify national & local legislation & permits that apply to project activity	
PUBLIC CONSULTATION	
Identify when / where the public consultation process took place	
INSTITUTIONAL CAPACITY BUILDING	
Will there be any capacity building?	[ ] N or [ ]Y if Yes, Attachment 2 includes the capacity building program

PART 2: SAFEGUARDS SCREENING AND TRIGGERS

ENVIRONMENTAL /SOCIAL SCREENING FOR SAFEGUARDS TRIGGERS			
	Activity/Issue	**Status**	**Triggered Actions**
Will the site activity include/involve any of the following??	A. Roads rehabilitation	[ ] Yes [ ] No	If "Yes", see Section **A** below
	B. New construction of small traffic infrastructure	[ ] Yes [ ] No	If "Yes", see Section **A** below
	C. Impacts on surface drainage system	[ ] Yes [ ] No	If "Yes", see Section **B** below
	D. Historic building(s) and districts	[ ] Yes [ ] No	If "Yes", see Section **C** below
	E. Acquisition of land[8]	[ ] Yes [ ] No	If "Yes", see Section **D** below
	F. Hazardous or toxic materials[9]	[ ] Yes [ ] No	If "Yes", see Section **E** below
	G. Impacts on forests and/or protected areas	[ ] Yes [ ] No	If "Yes", see Section **F** below
	H. Risk of unexploded ordinance (UXO)	[ ] Yes [ ] No	If "Yes", see Section **G** below
	I. Traffic and Pedestrian Safety	[ ] Yes [ ] No	If "Yes", see Section **H** below

[8] Land acquisitions includes displacement of people, change of livelihood encroachment on private property this is to land that is purchased/transferred and affects people who are living and/or squatters and/or operate a business (kiosks) on land that is being acquired.

[9] Toxic / hazardous material includes but is not limited to asbestos, toxic paints, noxious solvents, removal of lead paint, etc.

PART 3: MITIGATION MEASURES

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
0. General Conditions	Notification and Worker Safety	(a) The local construction and environment inspectorates and communities have been notified of upcoming activities (b) The public has been notified of the works through appropriate notification in the media and/or at publicly accessible sites (including the site of the works) (c) All legally required permits have been acquired for construction and/or rehabilitation (d) The Contractor formally agrees that all work will be carried out in a safe and disciplined manner designed to minimize impacts on neighboring residents and environment. (e) Workers' PPE will comply with international good practice (always hardhats, as needed masks and safety glasses, harnesses and safety boots) (f) Appropriate signposting of the sites will inform workers of key rules and regulations to follow.
A. General Rehabilitation and /or Construction Activities	Air Quality	(a) During excavation works dust control measures shall be employed, e.g. by spraying and moistening the ground (b) Demolition debris, excavated soil and aggregates shall be kept in controlled area and sprayed with water mist to reduce debris dust (c) During pneumatic drilling or breaking of pavement and foundations dust shall be suppressed by ongoing water spraying and/or installing dust screen enclosures at site (d) The surrounding environment (side walks, roads) shall be kept free of soil and debris to minimize dust (e) There will be no open burning of construction / waste material at the site (f) All machinery will comply with Polish emission regulations, shall well maintained and serviced and there will be no excessive idling of construction vehicles at sites
	Noise	(a) Construction noise will be limited to restricted times agreed to in the permit (b) During operations the engine covers of generators, air compressors and other powered mechanical equipment shall be closed, and equipment placed as far away from residential areas as possible
	Water Quality	(a) The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in canalization and nearby streams and rivers
	Waste management	(a) Waste collection and disposal pathways and sites will be identified for all major waste types expected from excavation, demolition and construction activities. (b) Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers. (c) Construction waste will be collected and disposed properly by licensed collectors (d) The records of waste disposal will be maintained as proof for proper management as designed. (e) Whenever feasible Contractor will reuse and recycle appropriate and viable materials (except when containing asbestos)
B. Impacts on surface drainage system	Water Quality	(a) There will be no unregulated extraction of groundwater, nor uncontrolled discharge of process waters, cement slurries, or any other contaminated waters into the ground or adjacent streams or rivers; the Contractor will obtain all necessary licenses and permits for water extraction and regulated discharge into the public wastewater system. (b) There will be proper storm water drainage systems installed and care taken not to silt, pollute, block or otherwise negatively impact natural streams, rivers, ponds and lakes by construction activities

		(c) There will be procedures for prevention of and response to accidental spills of fuels, lubricants and other toxic or noxious substances (d) Construction vehicles and machinery will be washed only in designated areas where runoff will not pollute natural surface water bodies

ACTIVITY	PARAMETER	MITIGATION MEASURES CHECKLIST
C. Historic building(s)	Cultural Heritage	(a) If construction works take place close to a designated historic structure, or are located in a designated historic district, notification shall be made and approvals/permits be obtained from local authorities and all construction activities planned and carried out in line with local and national legislation. (b) It shall be ensured that provisions are put in place so that artifacts or other possible "chance finds" encountered in excavation or construction are noted and registered, responsible officials contacted, and works activities delayed or modified to account for such finds.
D. Acquisition of land	Land Acquisition Plan/Framework	(c) If expropriation of land was not expected but is required, or if loss of access to income of legal or illegal users of land was not expected but may occur, that the Bank's Task Team Leader shall be immediately consulted. (d) The approved Land Acquisition Plan/Framework (if required by the project) will be implemented
E. Toxic materials	Asbestos management	(a) If asbestos is located on the project site, it shall be marked clearly as hazardous material (b) When possible the asbestos will be appropriately contained and sealed to minimize exposure (c) The asbestos prior to removal (if removal is necessary) will be treated with a wetting agent to minimize asbestos dust (d) Asbestos will be handled and disposed by skilled & experienced professionals (e) If asbestos material is be stored temporarily, the wastes should be securely enclosed inside closed containments and marked appropriately. Security measures will be taken against unauthorized removal from the site. (f) The removed asbestos will not be reused
	Toxic / hazardous waste management	(a) Temporarily storage on site of all hazardous or toxic substances will be in safe containers labeled with details of composition, properties and handling information (b) The containers of hazardous substances shall be placed in an leak-proof container to prevent spillage (c) The wastes shall be transported by specially licensed carriers and disposed in a licensed facility. (d) Paints with toxic ingredients or solvents or lead-based paints will not be used
F. Affected forests, wetlands and/or protected areas	Ecosystem protection	(a) All recognized natural habitats, wetlands and protected areas in the immediate vicinity of the activity will not be damaged or exploited, all staff will be strictly prohibited from hunting, foraging, logging or other damaging activities. (b) A survey and an inventory shall be made of large trees in the vicinity of the construction activity, large trees shall be marked and cordoned off with fencing, their root system protected, and any damage to the trees avoided (c) Adjacent wetlands and streams shall be protected from construction site run-off with appropriate erosion and sediment control feature to include by not limited to hay bales and silt fences (d) There will be no unlicensed borrow pits, quarries or waste dumps in adjacent areas, especially not in protected areas.
G. Risk of unexploded ordinance (UXO)	Hazard to human health and safety	(a) Before start of any excavation works the Contractor will verify that the construction area has been checked and cleared regarding UXO by the appropriate authorities
H Traffic and pedestrian safety	Direct or indirect hazards to public traffic and pedestrians by construction activities	(b) In compliance with national regulations the Contractor will insure that the construction site is properly secured and construction related traffic regulated. This includes but is not limited to ▪ Signposting, warning signs, barriers and traffic diversions: site will be clearly visible and the public warned of all potential hazards ▪ Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for pedestrians where construction traffic interferes. ▪ Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement

		▪ If required, active traffic management by trained and visible staff at the site for safe passage for the public ▪ Ensuring safe and continuous access to all adjacent office facilities, shops and residences during construction

PART 4: MONITORING PLAN (EXEMPLARY, TO BE EXPANDED AS NEEDED)

Phase	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Cost (if not included in project budget)	Who (Is responsible for monitoring?)
During activity **preparation**	site access traffic management availability of waste disposal facilities hazardous waste inventory (asbestos) construction material quality control (eg. paints / solvents)	at the site at the site in site vicinity on site Contractor's store / building yard	check if design and project planning foresee diligent procedures visual / analytical if in doubt visual / research in toxic materials databases	before launch of construction before start of rehabilitation works before approval to use materials	safety of general public, timely detection of waste disposal bottlenecks public and workplace health and safety	marginal, within budget marginal, within budget; (prepare special account for analyses at PMU?)	Contractor, Engineer
During activity **supervision**	dust generation noise emissions	on site and in immediate neighborhood, close to potential impacted residents at discharge points or	visual consultation of locals visual, analytical if	daily daily	avoidance of public nuisance	marginal, within budget	Contractor, Engineer

	waste and wastewater types, quality and volumes surface drainage soundness	in storage facilities	suspicious count of waste transports off site, check flow rates and runoff routes for wastewater	daily / continuous daily / continuous	avoidance of negative impacts on ground/ surface waters ensuring proper waste management and disposal		

6.3.3 Construction Supervision Consultant (Engineer) Responsibilities

The CSC will include a part-time International Environmental Specialist (IES) (for 8 weeks per year) and a National Environmental Specialist (NES) for six months per year to assist the PIU supervise and monitor implementation of the EMP during construction of all Project Components (It is assumed that one CSC will cover all Project Lots). The IES shall be degree qualified and have at least ten years of experience environmental monitoring for similar infrastructure projects. The NES must have qualifications and experience in ecology.

The main responsibilities of the CSC are as follows:

1. Monitor the Contractor's implementation of the EMP via weekly inspections of the Contractors camps and work sites by the NES;
2. Prepare Monthly Environmental Reports summarizing the Contractors compliance with the EMP for that particular month;
3. Prepare Quarterly Environmental Reports providing details of the Contractors activities (such as training programs, community meetings, etc) and compliance with the EMP. This activity shall be completed by the IES as part of his four annual trips of two weeks.

In the event that the CSC identifies any EMP non-compliance issues by the Contractor, a Non Compliance Notice will be issued to the contractor if the CSC requires action to be taken. The contractor will be required to prepare a corrective action plan which is to be implemented by a date agreed with the CSC. Non-compliance will be ranked according to the following criteria:

- Non Compliance Level I: A situation that is not consistent with requirements of the EMP, but not believed to represent an immediate or severe social or environmental risk. Repeated Level I concerns may become Level II concerns if left unattended.
- Non Compliance Level II: A situation that has not yet resulted in clearly identified damage or irreversible impact, but which demonstrates potential significance. Level II requires expeditious corrective action and site-specific attention to prevent severe effects. Repeated Level II concerns may become Level III concerns if left unattended.
- Non Compliance Level III: A critical situation that will result in significant social or environmental damage occurring or a reasonable expectation of very severe impending damage. Intentional disregard of Non Compliance Notices or specific prohibitions is also classified as a Level III concern.

The failure to prepare a corrective action plan or to implement it within the required timeframe will result in the Employer undertaking the work at the Contractor's expense (as will be specified in the Contract).

6.3.4 Contractor Responsibilities

The **Contractor** will appoint a full time **Environmental Manager** (EM) to be a senior member of the construction management team based on site for the duration of the contract. The EM shall have a university degree (preferably at Masters level) in Environmental Science or related discipline and have at least 10 years work experience in environmental management of infrastructure projects with specialist expertise in ecology.

Key responsibilities of the Contractor (through the EM) are as follows:

- Preparing the Construction Environmental Management Plan (CEMP) for approval by the Employer (PIU) prior to the Contractors taking possession of the construction site (see below).
- Ensuring the CEMP is implemented effectively throughout the construction period.
- Coordinating community relations issues through acting as the Contractor's community relations focal point (proactive community consultation, complaints investigation and grievance resolution).
- Establishing and maintaining site records of:
  - Weekly site inspections using checklists based on CEMP;
  - Environmental accidents/incidents including resolution activities;
  - Non-compliance notifications issued by the CSC;
  - Corrective action plans issued to the CSC in response to non-compliance notices;
  - Community relations activities including maintaining complaints register;
  - Monitoring reports;
  - Routine reporting of CEMP compliance and community liaison activities; and
  - Adhoc reporting to the CSC of environmental incidents/spillages including actions taken to resolve issues.

6.3.5 Construction Environmental Management Plan (CEMP)

Following the award of the contract and prior to construction commencing the Contractor will review the EMP and develop this into his detailed Construction Environmental Management Plan (CEMP). The CEMP will identify

persons who will be responsible for supervising the work within the Contractor's team. The CEMP will include a matrix of mitigation measures corresponding to specific site activities. This information will be presented on a series of site plans covering the whole project site showing all environmental management requirements for all activities in the construction phase. The CEMP will also include the following plans:

- Waste Management and Recycling Plan
- Construction Camp Plan
- Borrow Pit Plan
- Emergency Response Plan
- Air Quality Plan
- Health and Safety Plan

The CEMP will also include a monitoring plan and a reporting program corresponding to the requirements of the EMP. The CEMP will be submitted to ARS PIU and World Bank for review and approval prior to the Contractor taking possession of any work site.

It is recommended that the CSC's international environment specialist supports the Contractor's Environmental Manager through on the job training in the preparation of the CEMP. It is further recommended that the ARS PIU Safeguards team participate in such on the job training.

6.3.6 Site Induction

Following approval of the CEMP by the ARS PIU, the Contractor will be required to attend a site induction meeting with the CSC's International Environmental Specialist whereby the CEMP is confirmed with the Contractor to ensure that all compliance conditions are clearly understood. Following confirmation of the CEMP with the Contractor the CSC's International Environmental Specialist advises the CSC Team Leader that the Contractor is now cleared to take possession of the Site and may commence moving equipment to the Site. The Contractor will be responsible for ensuring that all sub-contractors abide by the conditions of the CEMP.

6.3.7 Reporting

Contractors Reporting - The Contractor will prepare two levels of environmental reports:

1. Weekly Environmental Checklists – These shall be prepared weekly by the Contractors EM and shall be submitted to the CSC on a weekly basis. A sample Checklist is provided by **Appendix G**.

2. Monthly Summary Report - (Maximum 3 pages and appendices, if required) in respect of compliance with EMP/CEMP requirements that will be submitted to the PIU through the CSC. The report will contain the following sections.

    a. Details of any environmental incidents

    b. Status of all non-conformance identified during audits and inspections that are identified by non compliance notices.

    c. Complaints from the public and proactive community relations activities

    d. Monthly Accident Report

    e. Waste volumes, types and disposal

    f. Details of any contaminated areas that have been identified and rehabilitated.

    g. Details of any archaeological discoveries.

    h. Details of any ecological issues.

    i. Other relevant environmental issues.

The Contractor will have a duty to immediately report to the CSC if any serious environmental breach has occurred during construction e.g. clearing of sensitive areas, serious oil spills etc.

CSC Reporting – The CSC will prepare two levels of environmental reports as follows:

Monthly Environmental Report – prepared by the NES and submitted to the ARS, this monthly report shall summarise the Contractors environmental performance based on the Contractors weekly checklists and the weekly site visits by the NES.

Quarterly Environmental Report – prepare by the IES and submitted to the ARS, this report shall be more detailed that the monthly monitoring reports and will include findings of the IES site visits to the Contractors work sites and camps.

6.3.8 World Bank responsibilities

In regard to implementation of environmental safeguards requirements for the project include: undertaking periodic monitoring of the EMP implementation and due diligence as part of an overall project review mission; and if required, provide advice to ARS in carrying out its responsibilities to implement the EMP for the project.

6.4 PIU CAPACITY BUILDING REQUIREMENTS

The PIU has an experienced Safeguard Specialist with strong experience of oversight of these types of road rehabilitation projects. It is not considered necessary for the Safeguard Specialist to undertake additional training from an International Environmental Specialist, however, it is strongly recommended that the World Bank support the PIU by sending the Safeguard Specialist on a study tour to help gain an insight of how Departments of Transport in other countries ensure environmental compliance in their projects.

6.5 EMP COSTS

The estimated cost for implementing the mitigation measures and monitoring plan for each Project Lot is provided in **Table 6-5** below. These items are those that would not normally be included in general construction budgets, such as PPE, erosion protection measures, septic tanks, vehicle washing bays, etc. The EMP costs during construction shall be part of Contractor's civil works package.

The EMP costs associated with monitoring the Contractors compliance be included in the construction supervision cost (**Table 6-6**). It is assumed that one CSC will be selected for all Project Lots.

The one-off EMP costs associated with Noise modeling and study tours shall be borne by the ARS (**Table 6-7**).

Table 6-5: Contractors EMP Costs

Item	Unit	Quantity	Unit Cost	Total
Environmental Costs - Civil Works (included in contractor's civil work package)				
Provision of Environmental Manager	MM	24	2,000	48,000
Preparation of CEMP	Lump Sum	1	5,000	5,000
Turtle and	Days	20	150	3,000

Tortoise Collection				
Fauna surveys in properties to be demolished	Days	10	150	1,500
Spill kits	Kit	10	250	2,500
Refuse / recycling containers	500 liter container	20	500	10,000
Disposal of hazardous waste	Week	104	250	26,000
Dust suppression measures	Day	400	125	50,000
Reinstatement of Borrow pits	Lump sum	2	25,000	50,000
Tree Survey	Lump sum	1	500	500
Tree cutting	Tree	50	200	10,000
Planting of trees	Tree	25	600	15,000
Maintenance of Trees	Tree	25	600	15,000
Seminars and Training	Sessions	48	100	4,800
Community Meetings	Meetings	24	200	4,800
Total (per lot)				**246,100**

Table 6-6: CSC EMP Costs

Item	Unit	Quantity	Unit Cost	Total
Environmental Management, Monitoring and Training Costs during Construction				

(Included in construction supervision cost)				
Remuneration and Per Diems				
IES	MM	2	25,000	50,000
NES	MM	6	3,000	18,000
Travel				
International Travel	Trip	2	2,000	4,000
Domestic Travel	Lump sum	1	20,000	20,000
Total				**92,000**

Table 6-7: ARS EMP Costs

Item	Unit	Quantity	Unit Cost	Total
Modeling and Monitoring Costs during Design and Training for PIU (Cost for ARS)				
Noise Monitoring and Modeling	Lump Sum	1	25,000	25,000
Study Tour	Lump Sum	0.5	10,000	10,000
Total				**35,000**

6.6 EMP IMPLEMENTATION SUMMARY

The following Table (**Table 6-6**) summarizes the various institutional responsibilities for the implementation of the environmental management plan at various stages of the Project Road rehabilitation.

Table 6-6: EMP Implementation

Project Stage	Responsible Institution	Responsibilities

Design	Detailed Design Consultant	Prepare noise modeling and propose noise mitigation measures
	ARS with the Detailed Design Consultant	Incorporate EMP mitigation measures into engineering design.
	ARS	Ensure EMP (and the proposed noise mitigation measures) is incorporated into the works Contracts.
	ARS	Review Contractors proposals to ensure that they are aware of the EMP requirements and that line items for environmental management as per the EMP (and the proposed noise mitigation measures) are included in the BOQ.
Pre-construction	Contractor	Prepare CEMP
	ARS	Review and approve CEMP
	ARS, Contractor and CSC	Site Induction
Construction	Contractor (through its EM)	• Daily monitoring of environmental issues • Preparation of weekly environmental checklists • Preparation of Monthly environmental reports • Preparing Corrective action plans
	ARS	• Routine site visits to monitor Contractors performance. •
	CSC	• Weekly monitoring of the Contractors compliance with EMP by the National Environmental Specialist. • Issuing the Contractor with Non-compliance Notices • Monthly reporting to ARS of Contractors performance based on

		the review of Contractors weekly checklists and weekly site visits. • Quarterly Environmental Reports prepared by the IES and submitted to ARS.

6.7 LOCAL ROADS SCREENING

As mentioned previously, the selection of the 100 kilometers of local roads has yet to start. To help ensure that the Designers select the most appropriate roads on an environmental basis two environmental procedures should be followed.

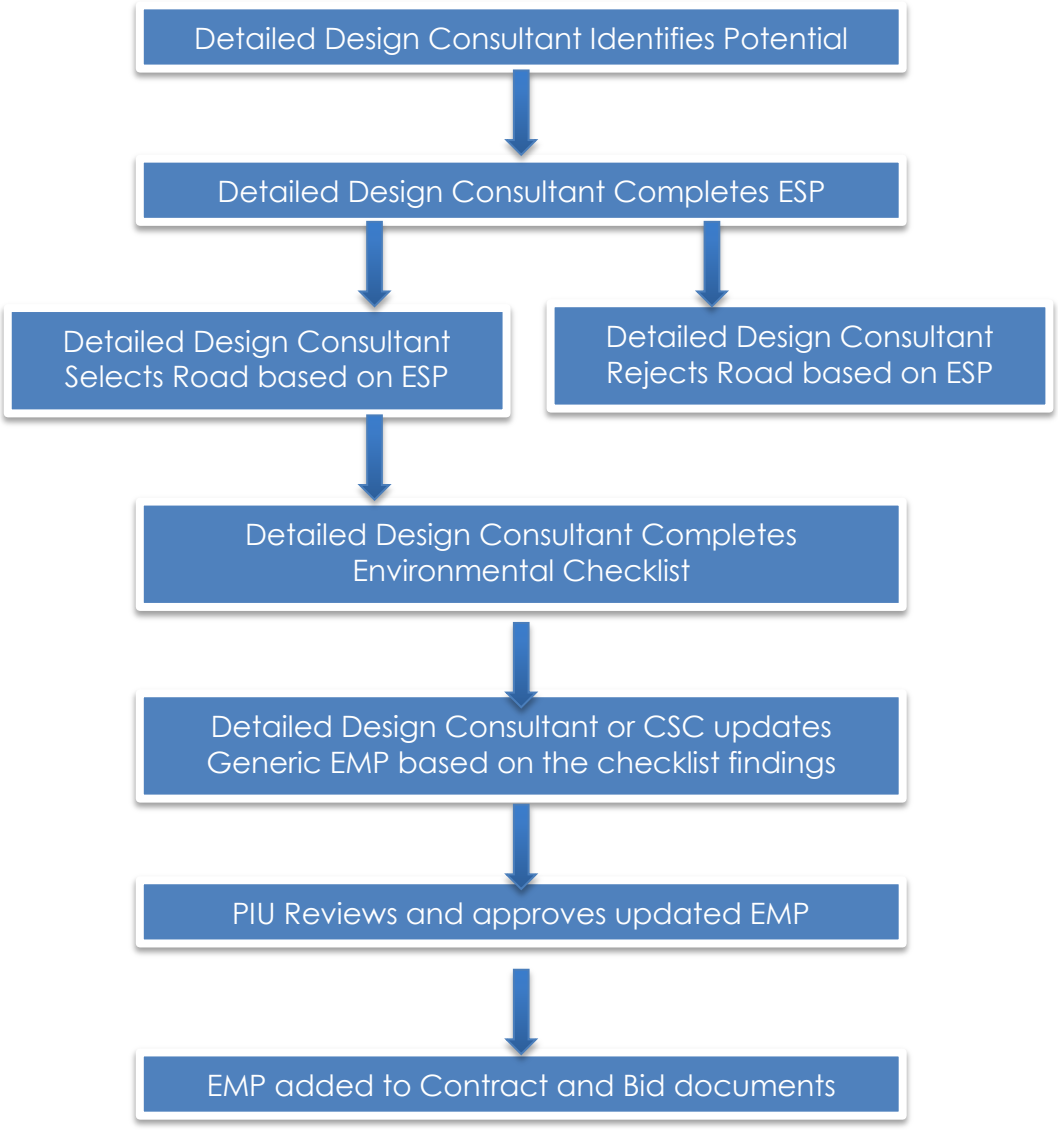
Firstly, an Environmental Screening Protocol (ESP) should be followed. The ESP (**Table 6-7**) is a simple checklist that the Designers should complete during site surveys to assess if the Local Roads will have significant environmental impacts, e.g. will they pass through a protected area or wetland, and should they be screened out of the selection process for those particular reasons. If any of the answers to the questions in the ESP are Positive, the designers should strongly consider alternative local roads for selection thereby reducing the potential for significant social and environmental issues arising from construction and operation of these roads.

Table 6-7: Local Roads Environmental Screening Protocol

#	Question	Answer	Screening Decision (Positive / Negative)
1	Is resettlement or compensation likely to occur due to required land take?		
2	Does the Project enter any protected area?		
3	Will the project impact upon any sensitive flora or fauna not identified in the Project EIA?		
4	Is the Project likely to have any significant impacts to sensitive receptors, such as		

	schools, hospitals, etc?		

Secondly, once the final decisions have been made regarding the local roads to be rehabilitated, the Design Consultant shall prepare site specific EMPs for each local road. The generic Local Roads EMP provided herewith as Table 6-3 and 6-3A provide most of the mitigation measures required for such projects. However, during the design phase the Design Consultant should review the conditions of each Local Road and evaluate if the generic EMP provided needs to be updated to include additional levels of mitigation and monitoring. To complete this task the Contractor should undertake a site visit to each specific road and complete the Environmental Checklist which is provided as Appendix G. Figure 6-1 illustrates the procedure outlined above.



7. STAKEHOLDER CONSULTATIONS

7.1 GENERAL

According to OP4.01 "For all Category A and B projects proposed for IBRD or IDA financing, during the EA process, the borrower consults project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental aspects and takes their views into account. The borrower initiates such consultations as early as possible".

Accordingly, this section of the report provides the results of the consultations undertaken during the preparation of this EIA report.

7.2 METHODOLOGY

Consultations were undertaken in four locations within three Rayons were the Project roads are located:

- Neftchela (29th May, 2014)
- Salyan (29th May, 2014)
- Sabiribad (30th May, 2014)
- Shirvan (30th May, 2014)

The consultations were undertaken with a range of stakeholders, including local government officials and local residents. Appendix A provides the names and details of all of the persons consulted.

During each meeting, the Consultant gave a presentation, via powerpoint (reproduced as handouts for each participant) summarizing the findings of the Environmental Impact Assessment. The presentation included:

- Summary of the EIA process
- Impacts Identified
- Mitigations measures proposed
- Monitoring actions.

The stakeholders were then invited to express their opinions on the findings of the EIA both verbally during the meeting, or in writing by completing a short form. The comments have been collated into a table included within Appendix A and Section 7.3 provides a summary of the main points raised during the consultation process.

7.3 CONSULTATION FINDINGS

Several comments were made about the provision of animal underpasses for cattle mainly to prevent accidents occurring when the animals cross the road. However, no specific locations were recommended for these underpasses during the meetings. The Design Consultant will therefore be responsible for ensuring that an adequate number of animal underpasses are provided.

A question was raised about detours, and if alternative access roads would be provided. The PIU responded that the Contractor will inform the local communities about the Contractors traffic management plan.

A few comments were made regarding the need for suitable culverts in particular locations. The Design Consultant shall ensure that all designs include correct sizes and locations of culverts.

One comment was raised regarding tree cutting and that it should not be allowed. Limited tree cutting will however be an unavoidable consequence of the Project. One participant of the meetings noted that reallocation/ replacement of trees in the ROW should be undertaken upon approval of Expertise Division of the Ministry of Ecology and National Resources.

Some local residents also expressed the view that the Contractor should employ local workers during the Project, as there is a strong capacity within the Project area for this type of work. This item has already been included with the EMP.

Many comments were raised about road safety, some wanted a higher speed limit and other a lower speed limit. Speed bumps and speed cameras were also requested to limit the speed of traffic on the roads. Comments were made about the radius on some curves being dangerous and that this issue should be addressed. Residents also commented on the need for pedestrian crossings and road signs. The PIU commented that the Design Consultant will ensure that the roads meets all of the technical requirements for road safety.

Comments were also received about the need to ensure timely transportation of construction wastes from the road sides during construction works. This issue is discussed within the Project EMP. Another participant in the meetings requested that we locate construction camps and aggregates not 300, but 500 meters from the residential areas. Accordingly the EMP has been updated to include this item.

Finally, many comments were also received regarding the benefits of the Project, in particular participants in the meetings felt that it will improve access to education facilities and that it would improve access to markets.

Figure 7-1: Consultations in Salyan

Figure 7-2: Consultations in Sabiribad

8. CONCLUSIONS & RECOMMENDATIONS

8.1 CONCLUSIONS

This EIA has established that there are no significant environmental issues that can not be either totally prevented or adequately mitigated to levels acceptable Azerbaijani and international standards for all Project activities.

8.2 RECOMMENDATIONS

The EMP, its mitigation and monitoring programs, contained herewith shall be included within the Bidding documents for project works for all Project components. The Bid documents state that the Contractor shall be responsible for the implementation of the requirements of the EMP through his own Construction Environmental Management Plan which will adopt all of the conditions of the EMP and add site specific elements that are not currently known, such as the Contractors borrow pit locations. This ensures that all potential bidders are aware of the environmental requirements of the Project and its associated environmental costs.

The EMP and all its requirements shall then be added to the Contractors Contract, thereby making implementation of the EMP a legal requirement according to the Contract. He shall then prepare his CEMP which will be approved and monitored by the CSC. Should the CSC note any non-conformance with the CEMP (and the EMP) the Contractor can be held liable for breach of the contractual obligations of the EMP. To ensure compliance with the CEMP the Contractor should employ an Environmental Manager to monitor and report Project activities throughout the Project Construction phase.

APPENDIX A - RECORDS OF CONSULTATION MEETINGS

Public participation, May 29, 30, 2014. Disclosure of Resettlement Policy Framework Document, Socio-Economic Study and Environmental Impact Assessment Reports to the community.

Rayon	Village/ Settlement	Name of Respondent	Question/ Comment	Respond	To be considered by
Salyan	Kurgaragashli	Mammadov Abbas Abdulla	Will the road to Kurqaraqashli village from the Salyan-Neftchala Road be rehabilitated?	Local Roads are to be identified during Design Stage of the Project. The community will be additionally informed on the local roads identified for rehabilitation.	
	Arbatan	Safarov Akif Alaskar	Will the road to Xurshud be included to project local roads?	Local Roads are to be identified during Design Stage of the Project. The community will be additionally informed on the local roads identified for reconstruction.	
	Kurgaragashli	Mammadov Abbas Abdulla	Please consider vide size for underpasses	-	For the attention of the Design Consultant
	Duzenlik	Zeynalov Agazade Amniyyat	1. If the road will be rehabilitated migration of the villagers will be stopped. 2. In case of resettlement the villagers will not send their land. 3. The schoolchildren cannot attempt schools	Resettlement is aimed to be avoided, unless the necessary changes in the design (required by road safety purposes) will be resulted in private/ state property impact. By completion of Design Study the locals will have been additionally informed on impact, if any. As alternative the impacted	

			due to terrible road conditions; villagers cannot take their products to the market that in turn leads to poverty. We all thankful to you for your work.	landowners might be offered land for land. In case of any impact to private property the impacted people will be met and all their rights and entitlements explained.	
	Duzenlik	Melikov Rustem Sadiq	When road construction works will start? Construction of the road to Kura River (Salyan) is included to this Project?	2015 No, this a part of another Project, Highway II, that is currently undergo.	
	Kursayli	Askerov Vilayet Samad	When road construction works will start?	2015	
	Yolustu	Bashirov Ilkin Yaqub	Add construction of Duzenli village road to the Project scope.		
	Xalach	Qarayev Safar Adalat	When construction works will be started and when completed. Reconstruction of underpasses and culverts during construction	Start of construction works is planned in 2015. Duration – 2 year and half.	For the particular attention of the Design

			roads; provision of agricultural underpasses for cattle.		Consultant
	Xalach	Aliyev Seyfali Sadiq	Due to terrible conditions of the roads within our village movement in the village becomes very limited. The soonest improvement of the local roads will positively impact to the villager's income.		
Neftchala	Ashagi Surra	Tagiyev Elshad Tavakkul	Please consider construction of runabout connecting village Ashagl Surra with highway		
	Ashagi Surra	Nagiyev Tahir Nagi	Speed limit of 50 km/h is too low for modern vehicle means. Please consider the design for higher speed. If construction of any barriers is considered? How much the road level will be increased? Will be provision of any alternative roads during	50km/h speed will be designed only for the road sections going through the residential areas. In the plain areas the speed of 100km/h will be designed. Construction of any barriers and the level of the road will be specified by the Design Consultant. Yes. The Contractor will additionally inform the local communities about traffic management	

			construction works considered?	plan, including this point.	
	The rayon Gaz maintenanc e Department, Senior Engineer	M.R. Gozelov	Please consider the land slop area at Qaravelli named place. Who are unauthorized users?		For the particular attention of the Design Consultant The ones without legal titles and rights to use the land cultivate it, build house or any other constructio ns on it, making profit from its usage.
	Boyat	Qafarov Asif Safar	In the area of Dordlar village and Khilli settlement of the Salyan-Neftchala highway please consider placement of additional deep culverts for under road waters We recommend destroying the black staff at the bottom of the current road. If not, then this staff will hold the		For the particular attention of the Design Consultant For the particular attention of the Design Consultant For the particular attention of

			water that will in turn cause destruction of the road. Simplification of the fast corner on the Boyat road		the Design Consultant
Shirvan		Ibrahimova Abida Rufulla	The Salyan road has terrible conditions. Especially we are unhappy with the condition of the road going to Hajiqahramanli settlement of Shirvan.		
	Hajiqahramanli settlement	Abdullayeva Solmaz Aga	The Shirvan-Salyan road is in terrible condition. I am against of trees cutting in the new project. Please also consider reconstruction of the streets' roads within the Hajiqahramanli settlement		
		Hajiyeva Almara Bazatkhan	The Shirvan-Salyan road is in terrible condition. Please accelerate reconstruction works.		

	The Central Post office of Shirvan	Abdulrahmanova Gulbaniz	I am not satisfied with the Salyan-Shirvan road current conditions. I live in Shirvan and have to travel to Qarabagli village of Salyan Rayon since my parents live there. I have difficulties while travelling to Salyan. Roads are terrible! Request: Please place grates at the road named Ganli Dere (at the both sides of the so-named Ganli Dere) on the Shirvan-Qaragli section of the highway		For the attention of the Design Consultant
		Hasanli Qachay Farrux	The Shirvan-Salyan road is in a poor condition. We all are willing the soonest reconstruction of the road. When the reconstruction will take place?	Will start 2015	

		Gancaliyev Salehugur	We have strong capacity in the road construction and maintenance sphere. Thus, it is recommended to use local capacity in the project works. Will you consider provision of pedestrian crossings? Road signs?	Will be recommended to the Contractor during construction stage Yes Yes	
		Ibrahimov Tofiq Elxan	Usage of internal human capacity in road construction sector is meaningful.		
		Askerov Safahat Vaqif	Reallocation/ replacement of trees in the ROW shall be undertaken upon approval of Expertise Division of the Ministry of Ecology and National Resources; Ensure timely transportation of construction wastes from the road sides during construction works;		To the attention of the PIU, Design Engineer, Contractor and the Construction Supervision Engineer

			Ensure implementation of EIA requirements; Ensure respond to contact telephone numbers of the Contractors during construction works (in case of grievances, complains) Ensure provision of alternative roads		
		Salimov Farhad	Pay attention to the quality of work, pay in time to workers, appropriately spending of the allocated fund, all needed conditions for the workers to be provided		
		Rahimov Faxraddin	Needed project, please ensure its implementation on time.		
		Mustafayeva Pari Yusif	Thank you for such a Project! I travel to Salyan quite a lot. We wish the soonest completion of the works.	Start is planned for	

			When do you expect the start and completion of the works? Will this project include reconstruction of Sarijalal settlement road of Saatli (between Sabirabad and Saatli rayons). If not, please consider reconstruction of this road also.	the year of 2015. Duration – 2,5 year. Not within this Project scope. We will recommend to the Government through adding your request to the report's Public Consultation Minutes.	
	Haciqahramanli settlement	Muradov Tarlan	Locate construction camps and aggregates not 300, but 500 meters from the residential areas; Please consider plantation at the road sides after completion of construction works; Please consider potential flood risk at the Hagigahramanli settlement section of the road		To the attention of the Design Consultant
		Haciyev Sakit Amir	Will the locals be given jobs	Yes	To the attention of

			in the construction works ?		the Contractor s
		Unit of the Garabag War Veterans	Don't leave the wastes produced during replacement of under road communicatio n utilities; Maximize number of underpasses; provide maximum number of U-turnes considering lots of villages connecting with the highway; provide underpasses for animals; In the Garabagli village area place foot paces for schoolchildren and villagers		To the attention of the Design Consultant and the Contractor To the attention of the Design Consultant and
		Ahadov Bakikhan	When will you start and when will you finish works? When the roads at the newly set residential area in the village will be	Start is planned for the year of 2015. Duration – 2,5 year. Not within the scope of this Project.	

			paved?		
		Gulmammad Abbasov	Would be good to widen the road up to 9 m Please increase number of road signs Please minimize number of fast corners	It is considered by the design	To the attention of the Design Consultant To the attention of the Design Consultant
		Abulhasan Ibrahimov Agasav	Good project. Currently there is very limited number of road signs. If the road side signs at night time are placed correctly on both sides of the road then driver will be able to see where the road turns and driving will be safe. Especially at the road turns. Can you minimize number of turns on the road? It would decrease number of accidents. Is it possible to place water	Will be considered by the Design Consultant	To the attention of the Design Consultant To the attention of the Design Consultant To the attention of the Design Consultant

			outlet culverts (like concrete channel, etc..) at the sections of the road passing through the residential areas?		
Sabirabad					Most of the people request soonest starts of constructio n works and widening of the road.
		Yolchiyev Afqan Yolchu	The road must be rehabilitated and please widen the road.		
	Yakha-Dellek	Amirov Agaselim Vahid	My only concern is reconstruction of the road. The way that takes 10 mintus we travel for 40-50 minuts. Amortization costs of the vehicle increases, it is getting difficult to transport ill and sick people to hospitals. It is dusty in summer and muddy in winter seasons.		
	Garagaj	Orkhan	Speed limit to be considered.		To the attention of

		Ismaylov	In order to control speed limit please provide radars and road humps, also, pedestrian crossings and bus stops.		the Design Consultant
	Polat-Togay	Habiba Khuduzade	Replacement of gas pipes during work construction works will interrupt gas supply. What happens with the street roads?	The community will be informed.	To the attention of the Contractor
	Minbashi	Rasim Malikov	Please provide side-paths in both sides, as well as warning signs in front of the school.		To the attention of the Design Consultant
	Garagaj	Sadi Damirov	While road construction works please control the speed limit by provision of road hums		To the attention of the Design Consultant
	Dallek	Zahid Amirov	My disappointment is that too small distance of local roads (100km) will be rehabilitated within this project.		
	Garagaj	Agamir Aliyev	My disappointment is that too small distance of local roads (100km) will be rehabilitated within this		

			project.		
		Faqan Imanov	Some of us are concerned with too narrow roads and provision of road hums. Lightening of the road will be useful.		
	Garagaj	Orujev Rashad	Require animal underpasses for cattle, since their absence cause accidents.		To the attention of the Design Consultant
	Garagaj	Vasif Huseynov	We believe that the new road will be of high quality, since currently as a result of the bad conditions vehicle being destroyed and must be repaired, busses cannot operate properly. Please accelerate the road construction works. What is authorized distance from the road to open the business?	35 meters away from the both sides of the centerline	
	Garagaj	Nurlan Zalov	Good road design, would be even better if the main		

			streets in the villages would have been also considered		
	Garagaj	Miralakbar Fatullayev Islam	Ensure provision of the road hums, radars and side-paths in the road. Will you provide road hum near the school?		To the attention of the Design Consultant
	Azadkend	Guliyev Habib Misir	Who will be the Contractor, when start? Will the road side constructions be affected?	Will be clarified during design stage. Locals will be informed on any property impact.	
	Garagaj	Balayev Ibrahimpasha Aliislam	The design must control high speed in the residential areas. The project delays.		
	Minbashi	Ismaylov Samadaga Bahman	Too small distance of local roads distance considered in the project.		

List of Persons Consulted - Neftchela, May 29, 2014

AZƏRBAYCAN RESPUBLİKASI NƏQLİYYAT NAZİRLİYİ
AZƏRİYOLSERVİS ASC
SALYAN-NEFTÇALA (R 46) YOLU ÜZRƏ ƏTRAF MÜHİT VƏ SOSİAL QİYMƏTLƏNDİRMƏ

Yer: Neftçala

Tarix: 29. 05. 2014

No	Adı, Soyadı	İş yeri	Vəzifəsi	Əlaqə telefonu	İmza
1.	Fağıyev Elşad	Aşağı Surra İƏDN	Nümayəndə	050-337-77-78	[signature]
2.	Əliyeva Böyükxanım	Boyat Bələdiyyə	Bələdiyyə sədri	050-674 45-37	[signature]
3.	Kərimova Xanım	Yux.Qaram. Bələdiyyə	Bələdiyyə sədri	050-588-14-05	[signature]
4.	İbişov Sohrab İ.	Neftçala Elektrik şəbəkəsi	rəis	050 250 68 61	[signature]
5.	Gozələr Mehrac R.oğ	Neftçala Qaz İstismar Sahəsi	baş mühəndis	051.949.07.09	[signature]
6.	Abiyev Yalçın Malik	Xırman Qazamanlı İ.Ə.D.N	nümayəndə	070-480-31-40	[signature]
7.	Nağıyev Tahir Nağı oğlu	N.çala rayonu Ş.Şıxı Bələdiyyə	Bələdiyyə üzvü	050 617-86-10	[signature]
8.	Qəfərov Asif Səfər oğlu	Boyat İƏDN	Nümayəndə	070-378-02-58	[signature]

9.	Əliyeva Böyükxanım İsmayıl				
10.	Əmirov Elşən Həsənağa	Neftçala Rayonu İcra Hakimiyyəti	Baş məsləhətçi	050-528-78-98	[signature]
11.					
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List of Persons Consulted - Salyan, 29th May, 2014

AZƏRBAYCAN RESPUBLİKASI NƏQLİYYAT NAZİRLİYİ
AZƏRİYOLSERVİS ASC
SALYAN-NEFTÇALA (R 46) YOLU ÜZRƏ ƏTRAF MÜHİT VƏ SOSİAL QİYMƏTLƏNDİRMƏ

Yer: Salyan Tarix: 29.05.2014

No	Adı, Soyadı	İş yeri	Vəzifəsi	Əlaqə telefonu	İmza
1.	Məmmədov Abbas Abdulla oğlu	Kür-Qaraqaşlı kənd inzibati ərazi dairəsi üzrə nümayəndə	Nümayəndə	050-389-50-25	
2.	Vəliyev Fəxrəddin Həsən oğlu	Kürqaraqaşlı bələdiyyəsi	Bələdiyyə sədri	070-647-79-06	
3.	Bəşirov İlkin Yaqub oğlu	Yolüstü kənd inzibati ərazi dairəsi üzrə numay.	Nümayəndə	050 232 03 74	
4.	Zeynalov Ağaxadə Əliniyaz oğlu	Yolüstü bələdiyyəsi	Bələdiyyə	050 394 35 42	
5.	Əliyev Seyfəli Sadıq oğlu	Xələc inzibati ərazi dairəsi nümayəndəsi	Nümayəndə	050 552 18 58	
6.	Qarayev Səfər Ədalət oğlu	Xələc bələdiyyəsi	Bələdiyyə	050 499 42 65	
7.	Məlikov Rüstəm Səsiy [illegible]	Abo-Kür istismar birliy	Sədr	050 381 15 41	
8.	Kuseynova [illegible]	OM BF [illegible]	koordinator	070 631 44 78	—

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List of Persons Consulted - Shirvan, 30th May, 2014

AZƏRBAYCAN RESPUBLİKASI NƏQLİYYAT NAZİRLİYİ
AZƏRİYOLSERVİS ASC
ŞİRVAN - SALYAN (R45) YOLU ÜZRƏ ƏTRAF MÜHİT VƏ SOSİAL QİYMƏTLƏNDİRMƏ

Yer: Şirvan

Tarix: 30.05.2014

No	Adı, Soyadı	İş yeri	Vəzifəsi	Əlaqə telefonu	İmza
1.	Əsgərov Səfahət Vagif	Şirvan şəhər İcra Hakimiyyəti	Şəhər İcra Hakimiyyəti başçısının müavini	050-518-89-99 055-244-68-00	[signature]
2.	Abdullayeva Solmaz Ağa qızı	Şirvan şəhər Hacıqabul [illegible]	Hacıqabul [illegible] Bələdiyyəsinin sədri	051-331-8890 055-584-60-84	[signature]
3.	İbrahimova Abidə Rufik qızı	Şirvan şəhər Hacıqabul qəzeti	Hacıqabul Bələdiyyəsində mühəsib	055-606-15-34	[signature]
4.	Hacıyeva Almaza Bazatxan	Şirvan şəhər Regional Poçt Filialı	Şirvan şəhər RPF əməliyyatçı	050-411-56-79	[signature]
5.	Abdulrəhmova Gülbəniz Süleyman qızı	Şirvan şəh RPF-teleqrafçı	Regional poçt filialı	051-5173438	[signature]
6.	Həsənli Ağaqaç Fərrux oğlu	Sahibkarlıq və hüquq qəzeti	redaktor müavini	050 3030084	[signature]
7.	Cəmələyev Saleh Uğur oğ	Şirvan TKQ Baş təşkilatçı	Baş [illegible]	051-282-33-84	[signature]
8.	İbrahimova Təfiqə Elxan	Şirvan TKQ	hüquqşünas	0505135455	[signature]

9.	Səlimov Fərhad Hüseynov	Müstəqil jurnalist	jurnalist	055-418-10-94	
10.	Rəhimov Fəxrəddin [illegible]	[illegible]	jurnalist	050 377 88 62	
11.	Mustafayeva Pəri	QHT sədri	müəllim	050 516 59 38 055 864 50 22	
12.	Muradov Tərlan	[illegible] icra nüm. müavin	müəllim	051-446-72-34	
13.	Cəfərov Telman	Şirvan El. Şəb	Baş mühəndis	050 250 62 43	
14.	[illegible] Q.oğ	[illegible]	Rəis müavini	050-301-96-46	
15.	[illegible] Şakir [illegible]	İcra [illegible]			
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18.					
19.					
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List of Persons Consulted - Sabiribad, 30th May 2014

AZƏRBAYCAN RESPUBLİKASI NƏQLİYYAT NAZİRLİYİ
AZƏRİYOLSERVİS ASC
ŞİRVAN - SALYAN (R45) YOLU ÜZRƏ ƏTRAF MÜHİT VƏ SOSİAL QİYMƏTLƏNDİRMƏ

Yer: Sabirabad, Minbaşı k.

Tarix: 30. 05. 2014

No	Adı, Soyadı	İş yeri	Vəzifəsi	Əlaqə telefonu	İmza
1.	Rafiq Rəsulov	Təqaüdçü	F/təsərrüfat		
2.	İsədov Kamran	F-təsərrüfat			
3.	Quliyev Qərib	F-təsərrüfatçı	Azadkənd kəndi ərazi nümayən. müav		
4.	Rəsulov Fəqan	F.-Təsərrüfatçı			
5.	Yolçuyev Əfqan	F-təsərrüfatçı			
6.	Salahov Famil	Azadkənd bələdiyyəsi			
7.	Abdullayev Qoşqar	fərdi təsərrüfatçı			
8.	Ağayev Həsrət	fərdi təsərrüfatçı			

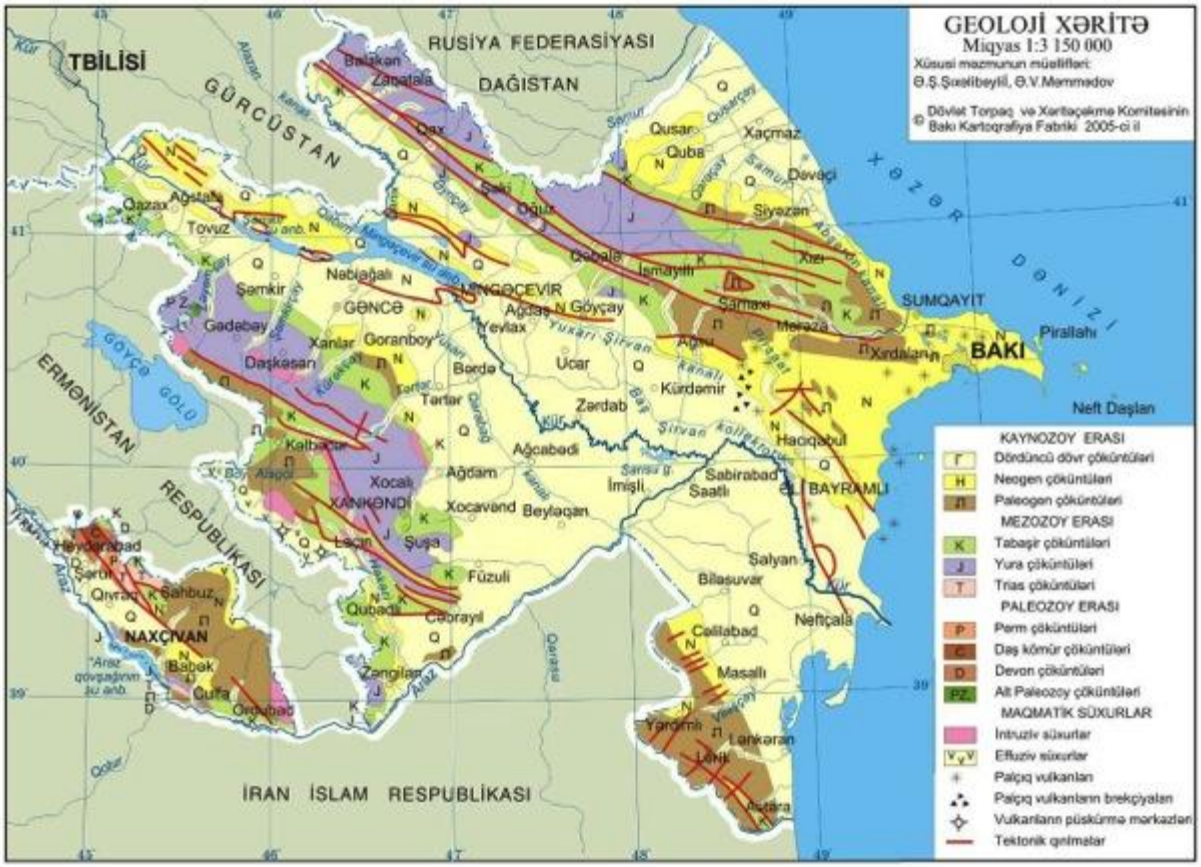
9.	Idilov İlham	fərdi təsərrüfatçı			[signature]
10.	Ağayev Samir	fərdi təsərrüfatçı			[signature]
11.	Qocayev [illegible]	Bələdiyyənin sədri			[signature]
12.	İsmayılov Teymur	[illegible] icra nüm. müa			[signature]
13.	Hacıyev Qurbanqulu	mühasib			[signature]
14.	Hacıyev [illegible]	Kitabxanaçı			[signature]
15.	[illegible] Cəmilə	Uşaq Bağ. müdiri			[signature]
16.	Nərmanova Sədaqət	müəllim			[signature]
17.	İsgəndərova Kəbirə	K/xanaçı			[signature]
18.	[illegible] Səadət	metodist			[signature]
19.	Hüseynov [illegible]	[illegible]			[signature]
20.	İsmayılov Elşad	[illegible] direktoru			[signature]

21.	Hüseynov Hüseyn	məktəb			
22.	Səmədova Mətanət	məktəb			
23.	Ələsimov Yusif	orta məktəb			
24.	Səmədov Loğman	orta məktəb			
25.	Əliyev Zakir	orta məktəb			
26.	Abbasov Niyaz	orta məktəb			
27.	Əsədov Hacıağa	SİB sədri.			
28.	İsmayılov Məmməd	F/təsərrüfatı			
29.	Hacıyev Vüqar	Fermer.			
30.	Babayev Vahid	F/t			
31.	Babayev Qılman	Komersant			
32.	Həzənov Füzuli	müəllim			

33.	Məmmədov İntiqam	Buxalter			
34.	Rəsulov Zöhrab	Fərdi təsərrüfatçı			
35.	Həmzəyev İlham	müəllim			
36.	İbadov Elvin	Şirvan şəh. sakini			
37.	Həsənov Agil	Fərdi təsərrüfatçı			
38.	Səmədova restorant	Direktor			
39.	İsmayılov Elnur	işçi			
40.	Hacıyev İmanəli	işçi			
41.	Əmirov Saiq	fərdi biznes			
42.	Hüseynova Bahar	fərdi bizn.			
43.	Hacıyev Sənan	sürücü			

APPENDIX B – ENVIRONMENTAL MAPPING

Figure B-1: Geology of Azerbaijan



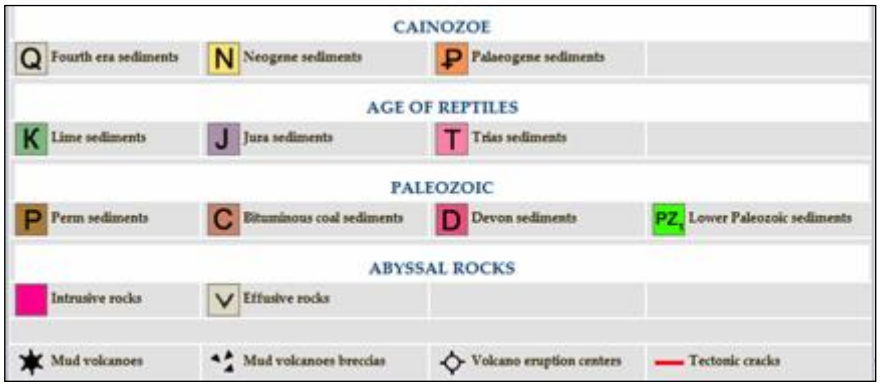


Figure B-2: Topography of Azerbaijan


RUSSIAN FEDERATION
GEORGIA
ARMENIA
IRAN
CASPIAN
SEA
AZERBAIJAN
Tbilisi
Rust'avi
Ijevan
Hradzan
Gavar
Yeghegnadzor
Kapan
Khvoy
Ahar
Qazax
Tovuz
Şämkir
Gäncä
Mingäçevir
Şäki
Zaqatala
Göyçay
Yevlax
Bärdä
Ağdaş
Ucar
Ağsu
Kürdämir
Şamaxi
Quba
Qusar
Xaçmaz
Däväçi
Siyäzän
Sumqayit
BAKI (BAKU)
Suraxani
Xirdalan
Artyom
Pirallahi Adasi
Çiloy Adasi
Xärä Zirä Adasi
Sabirabad
Qazimämmäd
Äli Bayramli
Saatli
Imişli
Salyan
Biläsuvar
Cälilabad
Masalli
Länkäran
Astara
Ağdam
Ağcabädi
Xankändi
DAĞLIQ QARABAĞ
(NAGORNO-KARABAKH)
NAXÇIVAN
Naxçivan
Lesser Caucasus
Caucasus
Şirvan Düzü
Mil Düzü
Muğan Düzü
ezilon.com
National Capital (1,800,000 in 2002)
over 100,000
over 50,000
over 30,000
over 10,000
other city
4000 m
3000 m
2000 m
1000 m
500 m
200 m
0 m
bellow sea level
0 km
20
40
60 km
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Figure B-3: Soils in the Project Area

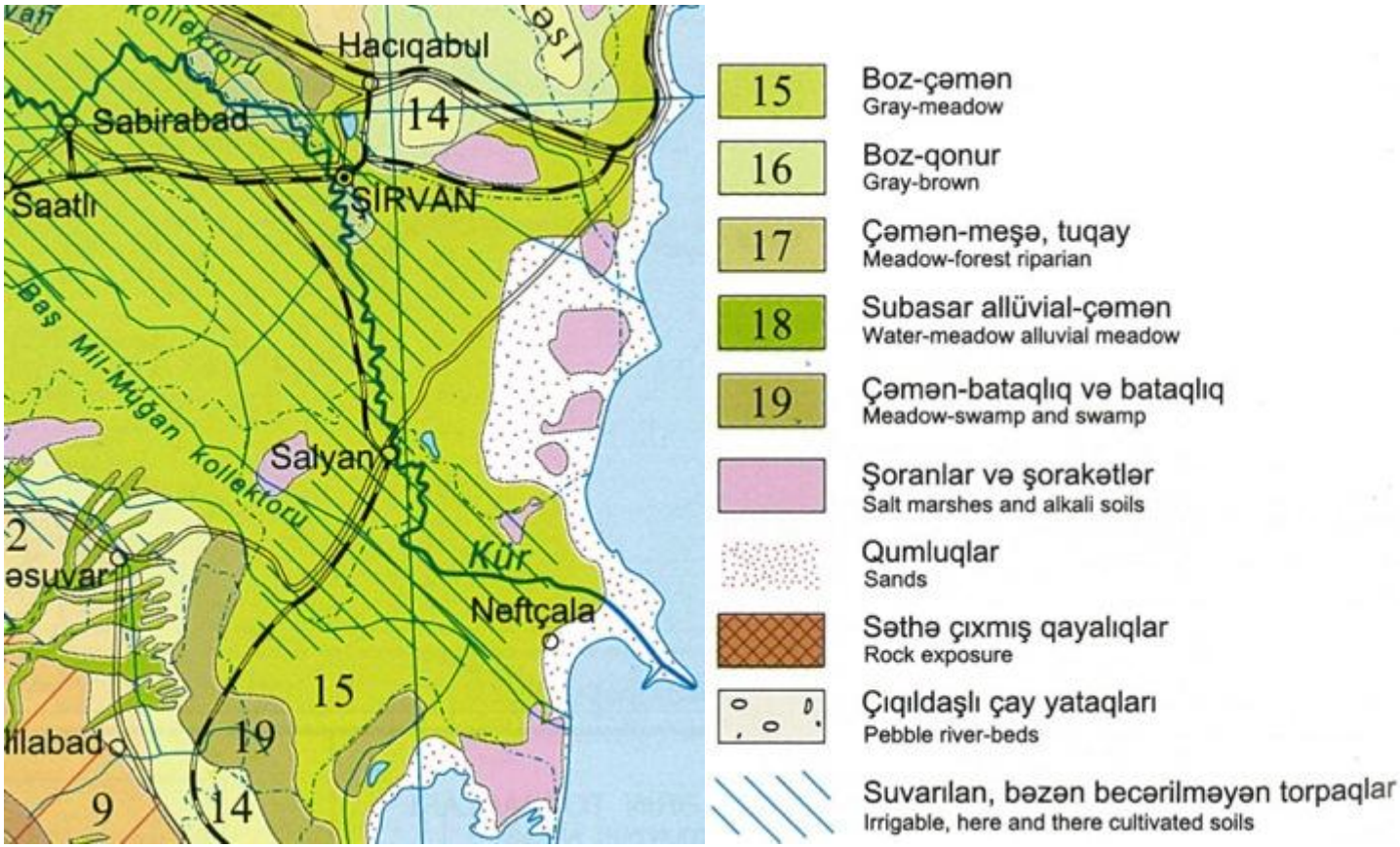


Figure B-4: Soil Salinization in the Project Area

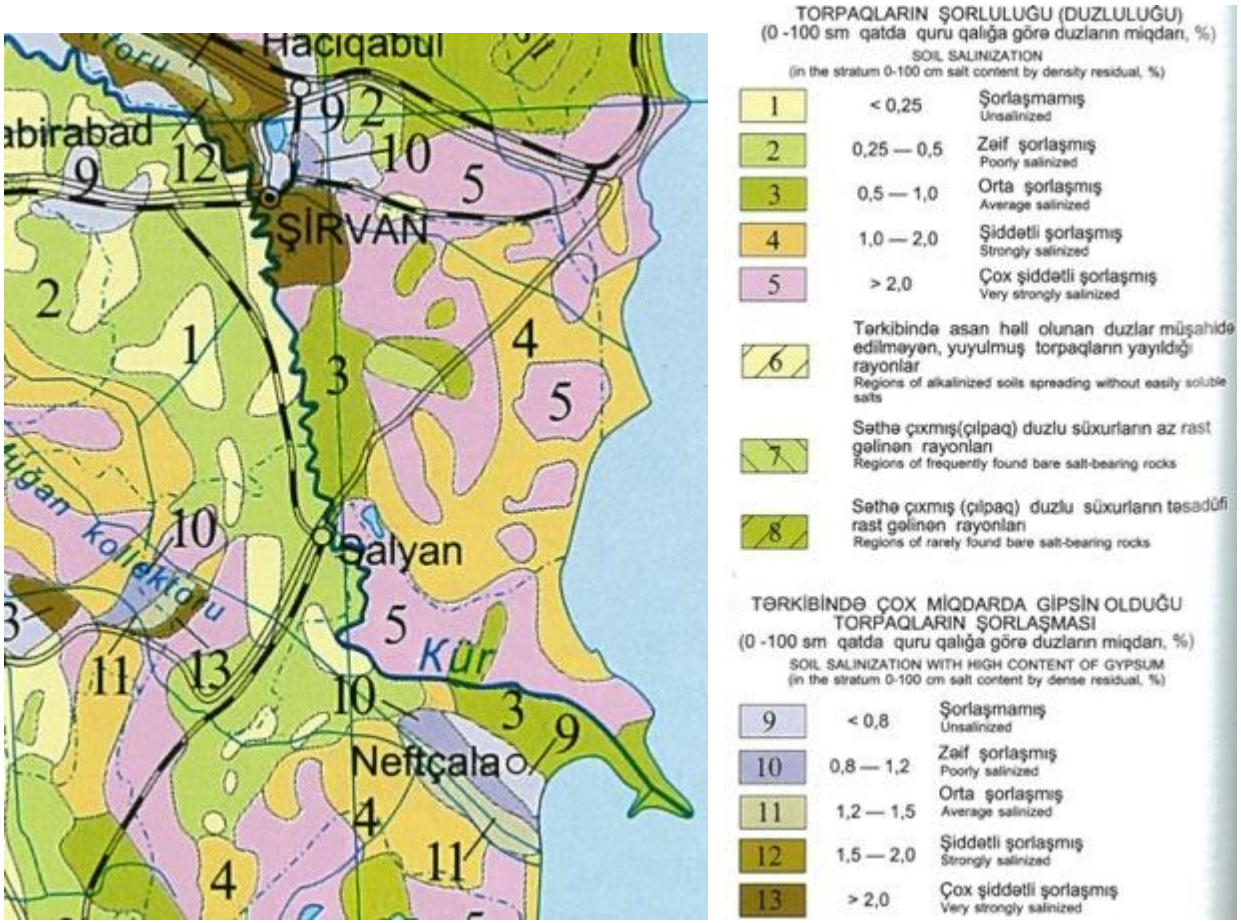


Figure B-5: Wind rose for Salyan

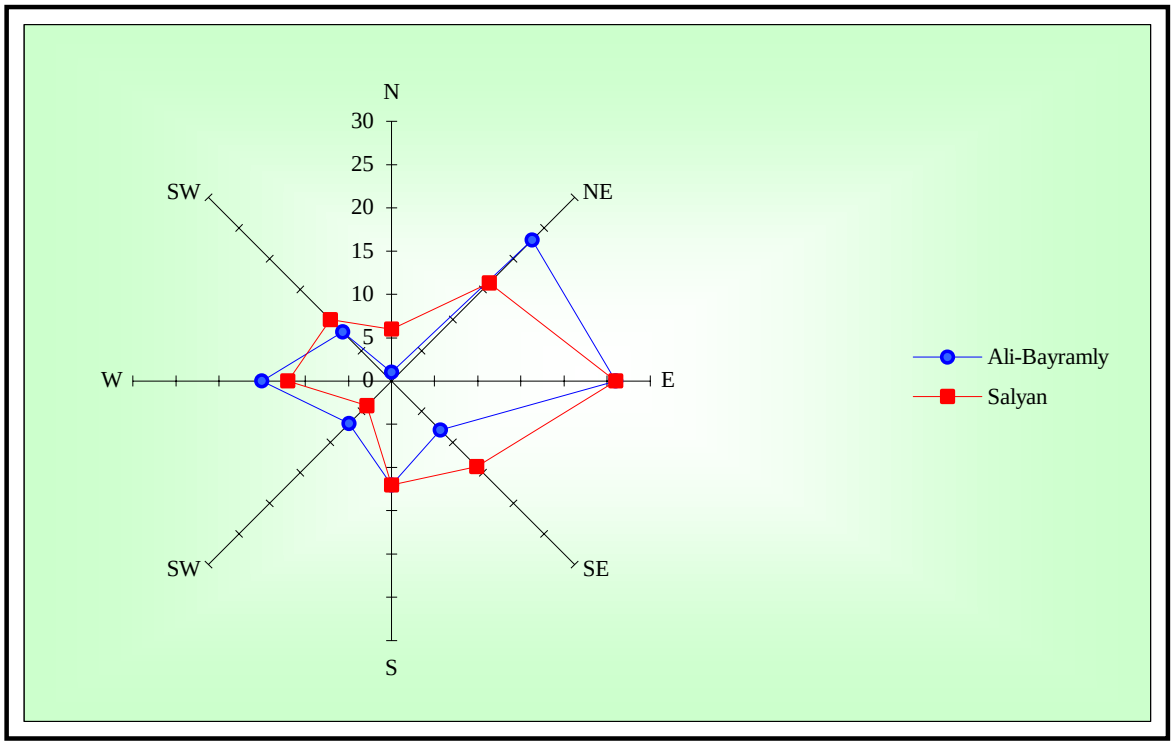


Figure B-6: Precipitation in the Project Area

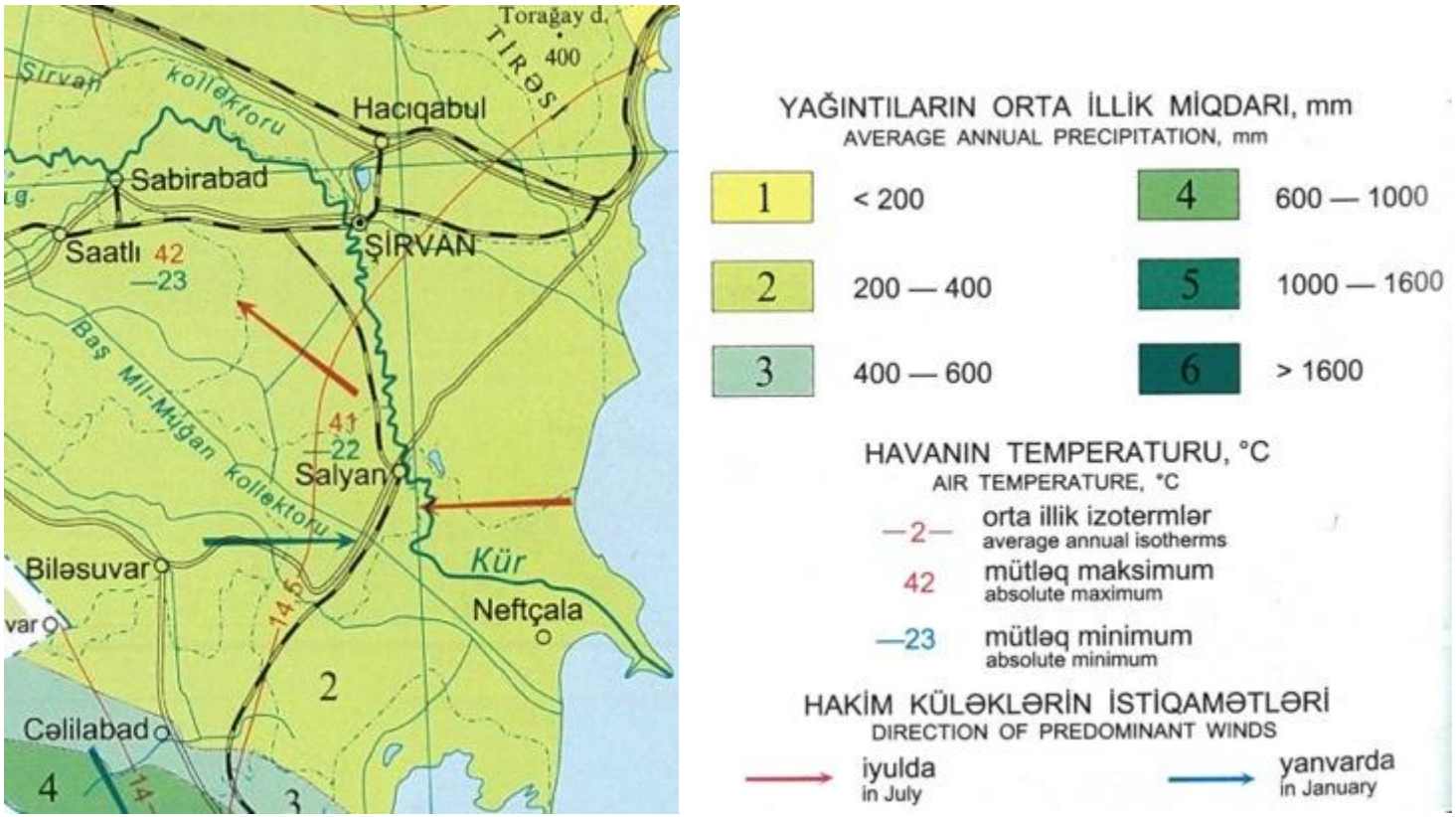


Figure B-7: Ecological Condition of the Kur River

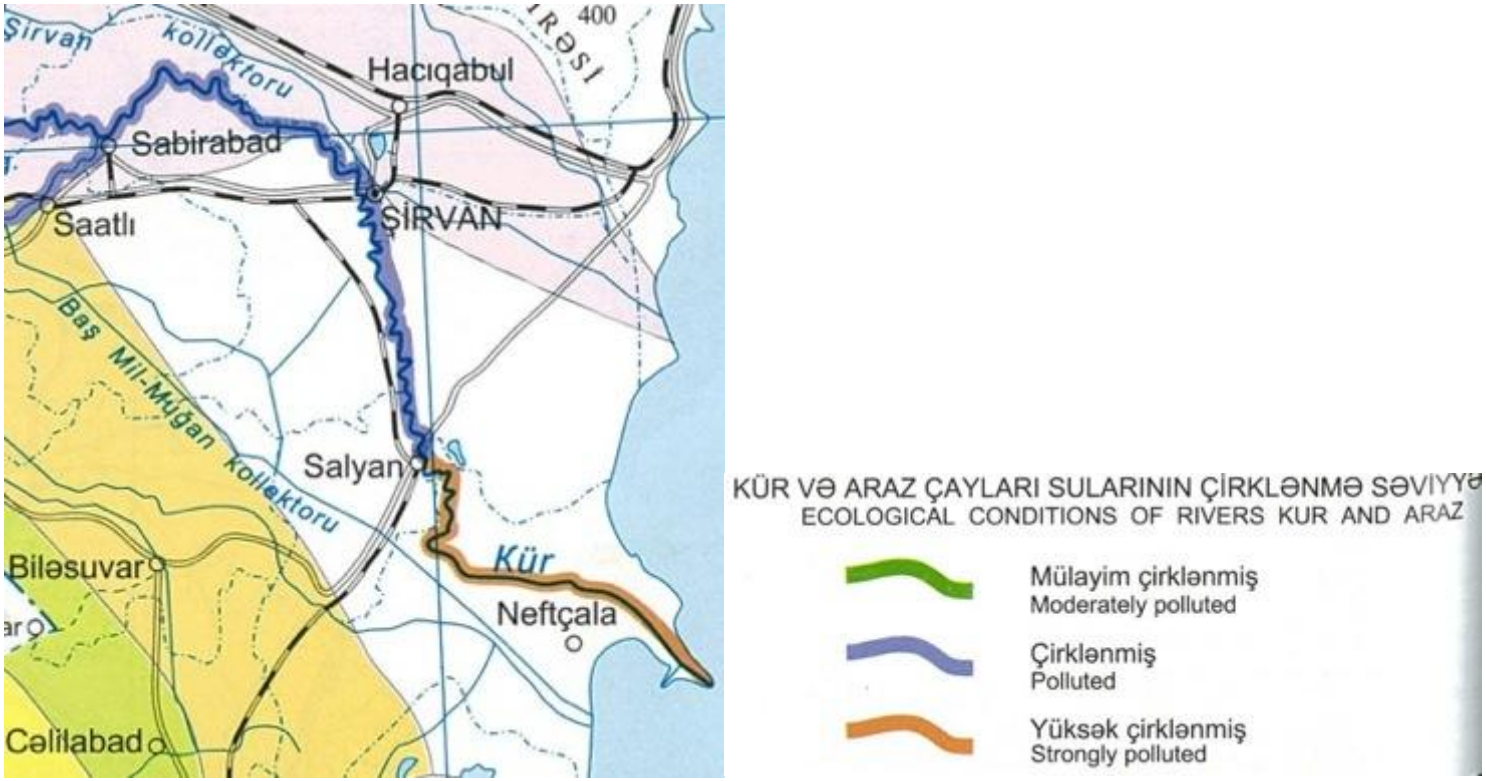


Figure B-8: Groundwater Depths in the Project Area.

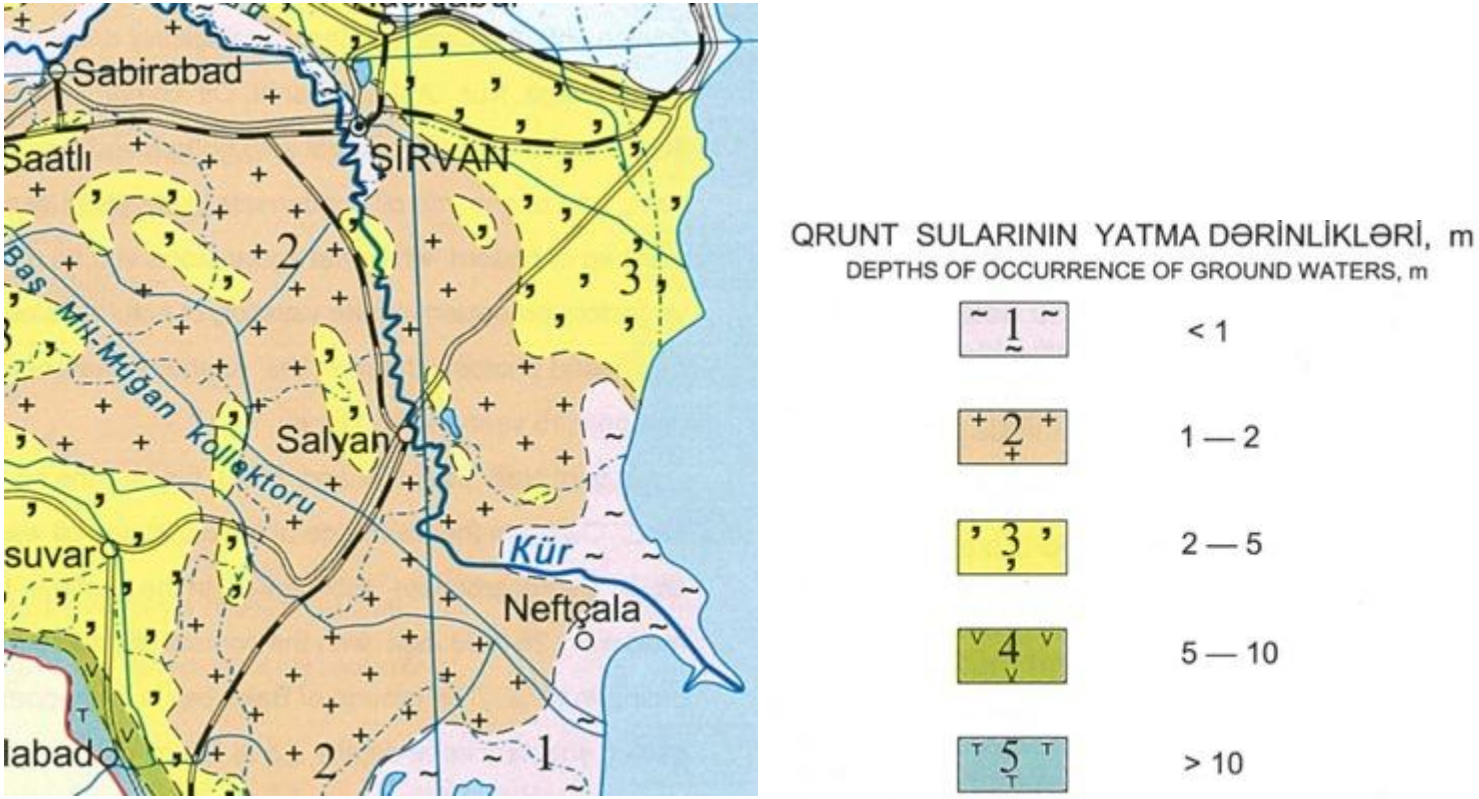
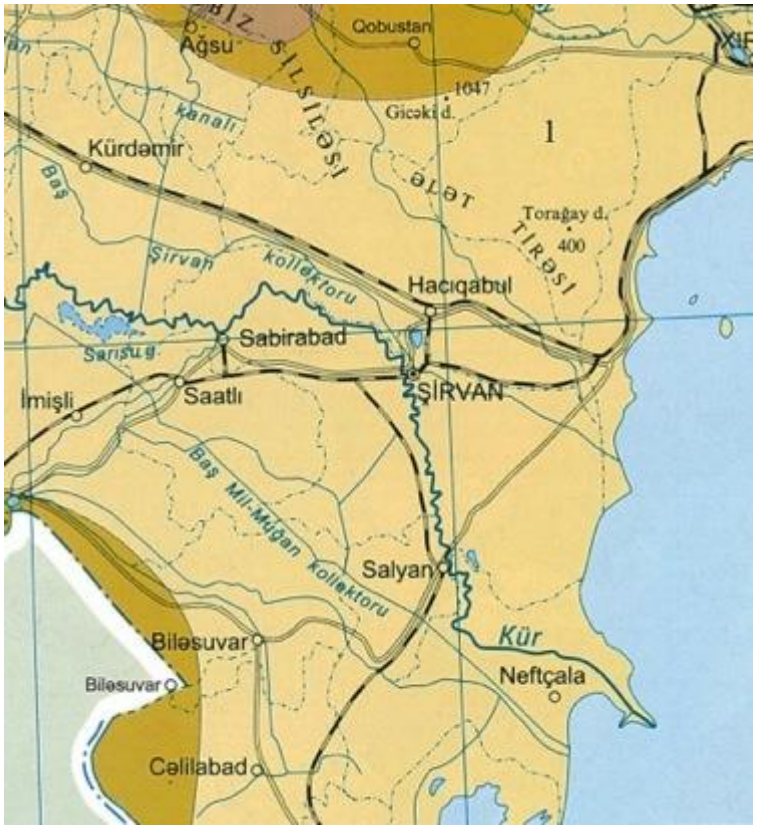


Figure B-9: Seismic Zones in the Project Area



SEYSMİK ZONALAR, ball
SEISMIC ZONES, ball

1	>7
2	>8
3	>9

ZONALARIN SƏRHƏDLƏRİ
BOUNDARİES ZONES

çox müəyyən edilmiş
more specific

az müəyyən edilmiş
less specific

ANNEX C – GREIVANCE REDRESS MECHANISM

C-1 GENERAL

In order to receive and facilitate the resolution of affected peoples' concerns, complaints, and grievances about the project's environmental performance an Environmental Grievance Redress Mechanism (GRM) will be established for each project component. The mechanism will be used for addressing any complaints that arise during the implementation of projects. In addition, the GRM will include a proactive component whereby at the commencement of construction of each project (prior to mobilization) the community will be formally advised of project implementation details by ARS, the Construction Supervision Consultant (CSC) and the Contractor (designs, scheduled activities, access constraints etc) so that all necessary project information is communicated effectively to the community and their immediate concerns can be addressed. This proactive approach with communities will be pursued throughout the implementation of each project.

The GRM will address affected people's concerns and complaints proactively and promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to all segments of the affected people at no costs and without retribution. The mechanism will not impede access to the Azerbaijan's judicial or administrative remedies.

C-2 REDRESS COMMITTEE, FOCAL POINTS, COMPLAINTS REPORTING, RECORDING AND MONITORING

The Grievance Redress Mechanism, which will be established at each project level (R45, R46 and Local Roads) is described below:

A pre-construction public consultation meeting will be convened by ARS for each project and attended by local residents, Contractor, CSC, ARS PIU representative and other interested parties. The objectives of the meeting will be as follows:

1. Introduction of key personnel of each stakeholder including roles and responsibilities. This will include introducing the Contractors Environmental Specialist to the group who organize and hold the monthly meetings.
2. Presentation of project information of immediate concern to the communities by the contractor (timing and location of specific construction activities, design issues, access constraints etc.) This will include a brief summary of the EMP – its purpose and implementation arrangements;

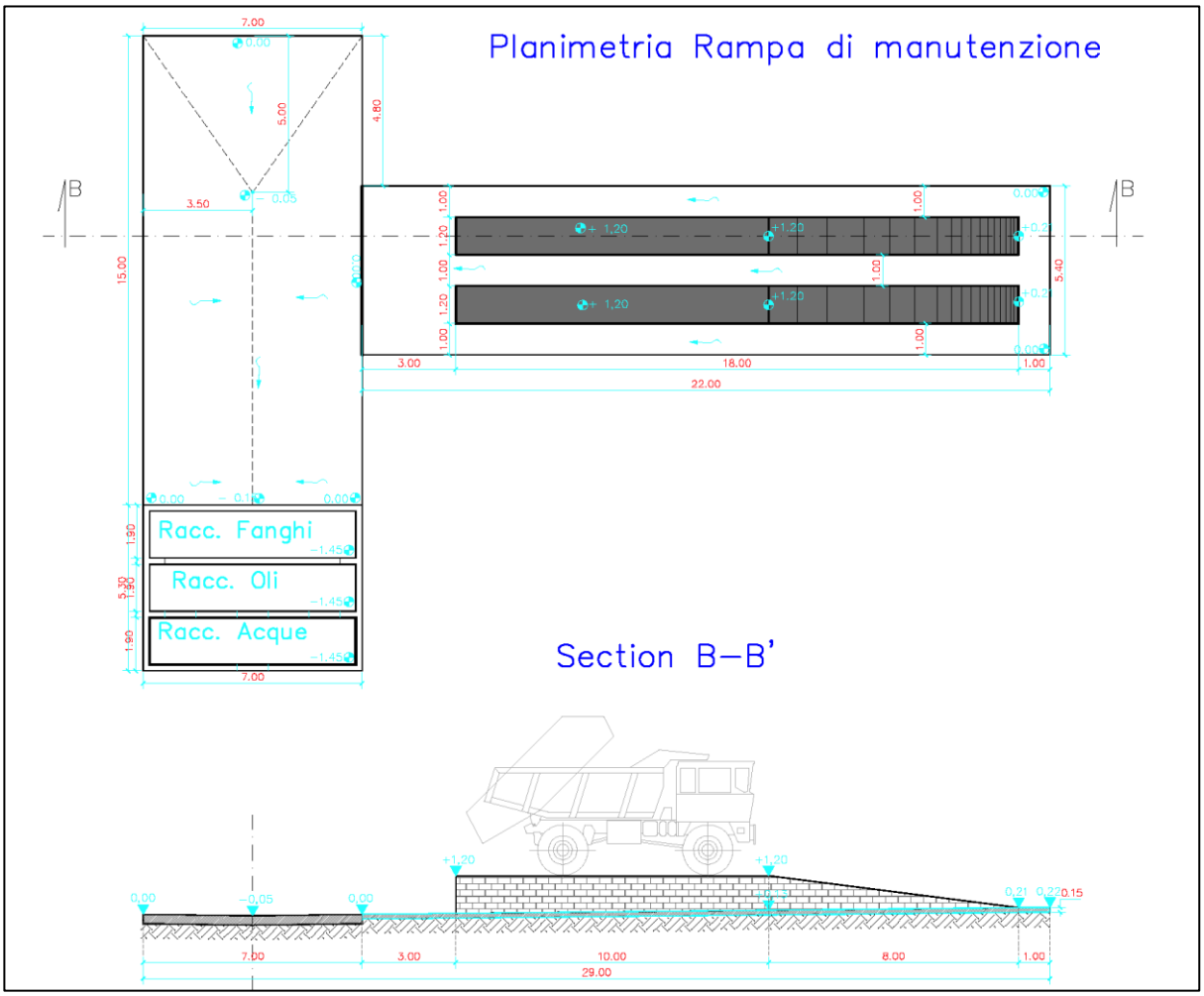
3. Elicit and address the immediate concerns of the community based on information provided above

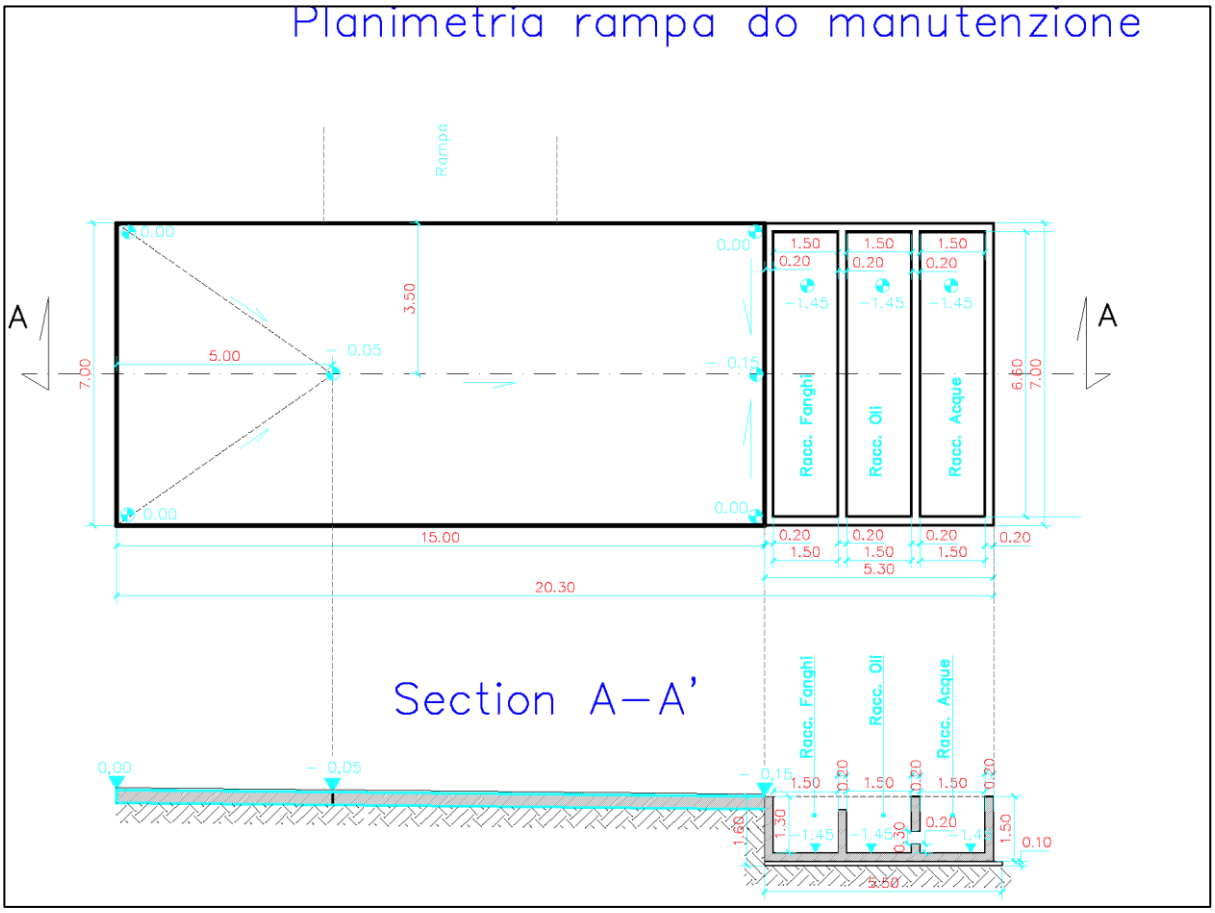
Following the pre-construction public consultation meeting regular monthly meetings will be scheduled by the Contractors ES within local communities to discuss any environmental and social issues and complaints associated with the construction activity. The Contractor shall prepare a schedule for the consultations which shall also be attended by the CSC. The contact details of the Contractors ES will also be provided to the local communities so that they may register any complaints outside of the meetings. The Contractors ES will keep a complaints register at his camp so that the ARS PIU and the CSC can review the complaints received and the methods to resolve the issues raised.

To help facilitate this process above ARS will assist affected communities/villages identify local representatives to act as Grievance Focal Points (GFP) for each community/village. GFPs are designated personnel from within the community who will be responsible for i) acting as community representatives in formal meetings between the project team (Contractor, CSC, ARS PIU) and the local community he/she represents and ii) communicating community members' grievances and concerns to the contractor during project implementation. The number of GFPs to be identified for each project will depend on the number and distribution of affected communities. It is anticipated that for the R45 and R46 Projects GFPs for villages within 2km of the proposed alignments could be required.

In addition, ARS will also keep track of the status of all complaints through the Monthly Environmental Monitoring Report submitted by the Contractor to the CSC and will ensure that they are resolved in a timely manner.

ANNEX D – VEHICLE WASHING BAY DESIGNS




Planimetria rampa do manutenzione
Rampa
A
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5.00
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Racc. Fanghi
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Section A–A'
0,00
0.05
0.15
1.30
1.60
0.10

ANNEX E – CONTRACTOR CHECKLISTS

#	Work Sector / Activity or Item / Issue	Answer		Comments / Actions
		Yes	No	
1	**Contractors Camp**			
1.1	Are all storage tanks for hazardous liquids located within impermeable bunded areas?			
1.2	Are spill kits, or spill containment measures available in the areas of stored hazardous liquids?			
1.3	Have there been any spills of leaks of liquids on the site? If yes, note type, location and amount of spill.			
1.4	Are waste storage containers located in the areas specified in the EMP?			
1.5	Are hazardous and non-hazardous wastes stored separately?			
1.6	Are hazardous waste liquids stored in suitable containers within a concrete bund?			
1.7	Are mobile generators stored within bunds?			
1.8	Are waste storage containers / areas clearly labeled?			
1.9	Are waste storage areas clean and tidy?			
1.10	Are records of hazardous waste disposal up to date?			
1.11	Are all waste materials stored at least 100 meters from surface water courses?			
1.12	Are fueling areas located on hardstanding with bunding or adequate drainage?			

1.13	Have there been any leaks or spills from fueling areas.			
1.14	Are drip pans placed below valves in fueling areas?			
1.15	Is washing of vehicles occurring in the correct vehicle washing areas?			
1.16	Are liquid wastes from the vehicle washing areas being collected and disposed of by a licensed company? If so, indicate date of last collection and provide manifest.			
1.17	Have silt levels been monitored in the vehicle washing areas to prevent overflowing?			
1.18	Are maintenance areas located on impermeable concrete with appropriate bunding or drainage?			
1.20	Have there been any leaks of oils in other parts of the site where maintenance activities have occurred?			
1.21	Is appropriate PPE available for workers handling hazardous materials?			
1.22	Do workers have access to potable water?			
1.23	Is there any discharge of contaminated waste water to surface water or to bare soils			
1.24	Is site waste water discharged to a septic tank? If yes, how often is the waste water collected by a licensed contractor?			
2	**Contractors Site Works**			
2.1	Have any interruptions to utilities been recorded?			

2.2	Have access roads been kept open to local residents?			
2.3	Have the access routes used for hauling materials been cleaned on a regular basis (state locations and periods of cleaning)			
2.4	Is dust suppression being undertaken on a regular basis?			
2.5	Are trucks delivering friable materials covering their load with tarps?			
2.6	Are there any stockpiles of materials within 100 meters of any river or water course?			
2.7	Are procedures in place for the control of stockpiled materials during periods of high winds?			
2.8	Are there any material stockpiles higher than three meters?			
2.9	Is there any sign of soil erosion occurring on embankments?			
2.10	Has topsoil been preserved in excavated areas?			
2.11	Has there been any discharge of contaminated water to surface waters or irrigation channels?			
2.12	Have there been any changes or alterations to irrigation systems?			
2.13	Have any construction materials or spoil been dumped on private lands without permission?			
2.14	Have waste materials been removed from river banks at the location of any bridge works?			
2.15	Is there evidence of waste materials deposited in any river?			
2.16	Is there any burning of waste materials in residential areas?			

2.17	Have there been any chance finds of historical or archeological artifacts?			
2.18	Have bridges been inspected prior to demolition for signs of nesting Lesser Kestrels?			
2.19	Have ponds and lagoons affected by project works been checked for turtles and tortoises, and have they been relocated to alternative areas if found?			
2.20	Have there been any impacts to any other flora or fauna habitat during works?			
2.21	Are waste containers (for both nonhazardous and hazardous waste) available at temporary construction sites?			
3	**Asphalt Plant**			
3.1	Are bitumen drums or containers, full or used stored on open permeable ground?			
3.2	Have there been any leaks or spills from bitumen storage areas onto open ground?			
3.3	Are all storage tanks for hazardous liquids located within impermeable bunded areas?			
3.4	Are spill kits, or spill containment measures available in the areas of stored hazardous liquids?			
3.5	Have there been any spills of leaks of liquids on the site? If yes, note type, location and amount of spill.			
3.6	Are waste storage containers located on the site?			
3.7	Are hazardous and non-hazardous wastes stored separately?			

3.8	Are hazardous waste liquids stored in suitable containers within a concrete bund?			
3.9	Has any hazardous waste been disposed of or stored in the incorrect locations?			
3.10	Have any hazardous solids or liquids been dumped outside of waste storage areas?			
3.11	Are waste storage containers / areas clearly labeled?			
3.12	Are waste storage areas clean and tidy?			
3.13	Are records of hazardous waste disposal up to date?			
3.14	Are fueling areas located on hardstanding with bunding or adequate drainage?			
3.15	Have there been any leaks or spills from fueling areas.			
3.16	Are drip pans placed below valves in fueling areas?			
3.17	Is washing of vehicles occurring in the correct vehicle washing areas?			
3.18	Are liquid wastes from the vehicle washing areas being collected and disposed of by a licensed company? If so, indicate date of last collection and provide manifest.			
3.19	Have silt levels been monitored in the vehicle washing areas to prevent overflowing?			
3.20	Is appropriate PPE available for workers handling hazardous materials?			
3.21	Do workers have access to potable water?			
3.22	Is there any discharge of			

	contaminated waste water to surface water or to bare soils			
3.23	Is site waste water discharged to a septic tank? If yes, how often is the waste water collected by a licensed contractor?			
4	**Borrow Pits**			
4.1	Are control measures in place at borrow pits to prevent overloading of transport vehicles?			
4.2	Have borrow pits been re-instated as per the borrow pit plan?			
4.3	Are dust suppression measures being implemented on borrow haul routes?			
5	**Grievance Mechanism**			
5.1	Have any grievances been recorded? If yes provide details.			
5.2	Have there been any complaints about access issues by residents?			
5.3	Have their been any complaints from residents regarding noise, or air quality?			
5.4	Have their been any complaints from residents regarding noise, or air quality at borrow pit locations?			
5.5	Have there been any complaints by residents regarding impacts to irrigation or agricultural areas?			
6	**Monitoring**			
6.1	Has the quality of the water used for domestic needs (in the accommodation, bathrooms and kitchens) been monitored during the period? If so, attach results.			

6.2	Have noise levels been monitored during the period? If so, attach results.			
6.3	Have vibration levels been monitored during the period? If so, attach results.			
6.4	Have dust levels been monitored during the period? If so, attach results.			
6.5	Has water quality in surface waters been monitored during the period? If so, attach results.			

ANNEX F – LOCAL ROADS ENVIRONMENTAL CHECKLISTS

Local Roads Environmental Checklist

Road Name: _____

Rayon _____

Total Length of Road _____

Location of the Road				
Area	**Yes**	**No**	**Chainage**	**Explanation** (including distance of trees, houses, wetlands, etc from road shoulder)
Agricultural land				
Wetlands				
Urban				
Pastureland				
Forest / Woodland				
Protected Area				

Description of the Environment				
Parameter/component	**Yes**	**No**	**Chainage**	**Explanation**
Is the area along the project road prone to flooding?				
Is the area along the project road subject to any other natural hazard?				
Is there any special status flora or habitat within 500 meters of the road?				
Is there any bird migration area within				

500 meters of the road?				
Is there any surface water course within 50 meters of the project road?				
Is there any sensitive noise receptors within 500 meters of the Project road?				

Environmental Impacts				
Potential Impacts - will the project cause:	**Yes**	**No**	**Chainage**	**Mitigation**
Encroachment on historical/cultural areas?				
Disfiguration of landscape by road embankments, cuts, fills, and quarries?				
Encroachment on precious ecology (e.g. sensitive or protected areas)?				
Alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?				
Impacts to water quality from discharged water?				
Pollution due to due to poor sanitation and solid waste disposal in construction camps and work sites?				
Possible transmission of communicable diseases from workers to local populations?				
Deterioration of surface water quality due to silt runoff?				

Increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?				
Noise and vibration due to blasting and other civil works?				
Dislocation or involuntary resettlement of people?				
Creation of temporary breeding habitats for mosquito vectors of disease?				
Accident risks associated with increased vehicular traffic leading to loss of life? Dust from the transport of materials?				

Permits Required before works commencement			
Prmit	**Yes**	**No**	**Remarks**
For water extraction			
For borrow pits			
For tree cutting			
For disposal of waste			

Submitted by (Design Consultant): _____
Position: _____
Date _____

Reviewed by (PIU Staff): _____
Position: _____
Date: _____

Notes from Reviewer: