AZERBAIJAN REPUBLIC
MINISTRY OF TRANSPORT
ROAD TRANSPORT SERVICE DEPARTMENT

UPGRADING OF A
22 KM SECTION OF THE ALYAT-ASTARA HIGHWAY

ENVIRONMENTAL ASSESSMENT

September 2005
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ACRONYMS
BP  British Petroleum
DRMU  District Road Maintenance Unit
EA  Environmental Assessment
EA&MF  Environmental Assessment & Management Framework
EAR  Environmental Assessment Report
EIA  Environmental Impact Assessment
EMP  Environmental Management Plan
ESS  Ecology and Safety Sector
IDA  International Development Association
MENR  Ministry of Ecology and Natural Resources
MoH  Ministry of Health
NGO  Non Government Organization
OP/BP  Operational Policy/Bank Policy
PIU  Project Implementation Unit
REA  Regional Environmental Assessment
RoW  Right of Way
RPF  Resettlement Policy Framework
RTSD  Road Transport Service Department
SER  State Ecological Review
ToR  Terms of Reference
WB  World Bank

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EXECUTIVE SUMMARY AND CONCLUSIONS

Introduction / Project Scope
The present Environmental Assessment Report (EAR) has been elaborated as part of the proposed IDA loan for the preliminary design of the first 22 km section of the 313 km Baku – Alyat – Astara motorway (M 3). This project is planned to be implemented in the frame of the Azerbaijan Motorway Improvement and Development or ‘Highway II’ Project, which would include the upgrade of the entire M3 Motorway to a 4 lane road, the construction of new 4 lane road sections and individual bypasses around key towns.

In connection with the ‘Highway II’ Project a ‘Regional Environmental Assessment’ (REA), ‘Environmental Assessment and Management Framework’ (EA&MF) and ‘Resettlement Policy Framework’ (RPF) have been prepared to facilitate implementation and to ensure that sub-projects will comply with Azerbaijan’s legislation, procedures and policies, international Conventions and WB safeguard policies, in particular in terms of environment, resettlement and land acquisition. These tools have guided the conduct of the present EA study and provided the framework for the elaboration of the various impact mitigation measures and provisions for environmental management during project implementation.

Regarding the overall corridor between Alyat and Astara the main objective of the ‘Highway II’ Project is to reduce transport costs and improve access, transit and safety within Azerbaijan’s north-south corridor through the implementation of a number of sub-projects. For road users the implementation of the Highway II Project would lead to a better road quality meeting mid-term traffic projections, better safety through new alignments and bypasses of cities, avoiding hazardous crossing of villages by heavy transit traffic, lower travel costs and a shorter travel time.

According to the traffic study for this 22 km section the average annual daily traffic is estimated at 5,663 in 2005. The average annual change is estimated at 13.39% in the period 2005 – 2008. Between 2008 – 2013 the annual change is expected at around 8.10% and at 5.78% between 2013 and 2023.

The proposed upgrading of the present 22 km section of the M 3 south of Alyat is the first sub-project to be implemented under the Highway II Project. Construction of this section is planned to commence in spring 2006 and to last for about 18 months. Opening of the improved road facility to traffic is planned for the beginning of 2008.

The World Bank (WB) has classified this project as a Category B project under the provisions of WB OP 4.01. According to these provisions the EA for a Category B requires to provide an environmental management plan (EMP) and to consult with the potentially affected public at least once, when a draft EAR is prepared.

Description of the Project Including Alternatives to the Development
The road section under study is located at about 5 km to the south of Alyat between km 80 and km 102 of the existing M 3 Motorway. In this section it is proposed to widen the existing 2 lane motorway to 4 lanes within the existing Right of Way (RoW). Between km 90.5 and 102 the M3 runs alongside the western boundaries of the Shirvan National Park.
The proposed design features for the upgrading of the 22 km section are as follows:

- Maximum width of the road: 27.5 m
- Carriageway width: 15 m (2x7.5 m)
- Width of shoulder: 3.75 m (2x3.75 m) of which 2.5 m (2x2.5 m) should be paved with asphalt concrete
- Slope ratio: 1:3 if possible
- Cross-fall in the carriageway: 2%
- Cross-fall in the shoulders: 4%
- Width of median: 5.0 m.

Design alternatives that were considered were the siting of the 2 new lanes to either the east or to the west of the existing road. The selection of the western side as the ‘preferred alternative’ for the alignment of the 2 new lanes was guided by the facts that this alternative (i) avoids any direct physical implications regarding the boundaries of the Shirvan National Park and (ii) requires less replacement of utility lines.

Consideration was also given to the option of replacing small existing bridges by new ones or to build new box culverts instead. As no permanent natural streams exist in the section under study it was decided to replace all these smaller bridges by box culverts which are cheaper to build and to maintain. The bridge over the Shirvan Main Collector will be replaced by a new bridge with improved design and safety standards.

Plantations of local species of shrubs are foreseen in the median of the upgraded road and tree plantations around the bus stops which are located at the junctions to Xidirli and Kürsengi.

**Description of the physical environment**

The landscape of the project area is determined by its vicinity to the western coast of the Caspian Sea and its location in the Kura – Araz lowlands. The land in this lowland zone is a monotonous wide and flat plain extending along the Caspian Sea in a strip of 10 to 40 km width with altitudes in the project area range between –28 and 0 m. The prevailing type of land use is animal husbandry in its traditional extensive form.

The climate in the Kura – Araz lowlands is characterized by dry sub-tropical and semi-desert – steppe climate with very hot summers and moderately warm winters. The average annual rainfall is 200-300 mm. In the area around Alyat the prevailing direction of wind during both summer and winter is north. Strong winds are rather frequent here, sometimes reaching speeds of 30 m/s.

Soils in the study corridor are meadow grey soils which are generally characterized by low moisture and humus content and locally contain high salt concentrations. However, in case of good irrigation these soils may be very productive.

Groundwater conditions in the project area are mainly influenced by the Caspian Sea. Groundwater levels are at about 3 m, very rarely at 3-5 m. The natural groundwater level has been lowered through the collector-drainage system, which criss-crosses the landscape especially in the west of the road. Due to its high salinity this groundwater is not suitable for drinking water purposes or economical use.

Natural perennial streams or rivers do not exist in the project area. The Shirvan Main Collector crosses the road at about KM 90.5 and is the main surface water in the study corridor. Water quality in the collector is characterized by high silt loads, relatively high salinity and reported to be polluted by chemicals from agriculture. The Shirvan Main Collector drains into the Caspian at about 14.5 km as the crow flies to the south-west of the M 3. Temporary streams and shallow ponds occur in local depressions, mainly during 4 to 6 weeks during spring.

**Description of the natural environment**
The flora in the study corridor is formed of common dry saltwort and ephemeral desert and wormwood-saltwood semi desert species with annual and perennial grasses forming more than 90% of the vegetation. Woody-shrubby vegetation accounts for less than 10% of the vegetation cover.

Regarding the fauna there are no specifically valuable habitats in the immediate vicinity of the existing M 3. More important habitats are some smaller wetlands, which are located in the south of the Shirvan Main Collector inside Shirvan National Park. During spring there wetlands are the temporary feeding habitat of numerous bird species, including species listed in the Red Data Books of Azerbaijan and IUCN. This can be explained by an important bird migration route that passes over this territory and that attracts huge populations of birds during March-July, many of which are migratory birds. The most important Red Data species that have their feeding habitats in these temporary wetlands are *Phalacrocorax pygmeus*, *Aythya nyroca*, *Haliaeetus albicilla*, *Aquila heliaca*, *Tetrax tetrax* (World Red Data Book) and *Phoenicopterus ruber*, *Francolinus francolinus*, *Porphyrio porphyrio*, (Azerbaijan Red Data Book). During the second part of summer these wetlands fall dry. Among mammals rare species are the Persian Gazelle, listed in both the IUCN list and Azerbaijan Red Data Book) and *Vormela peregusna* (Azerbaijan Red Data Book). The Shirvan Main Collector is habitat for many fish species that local people use for both, personal supply and commercial purposes.

**Protected areas**
The Shirvan National Park is located to the south-west of the M 3 between km 90.5 and km 102 to the east of the M 3. The landscape of the Park is formed by semi-desert, wetlands and sandy coastal zones.

The main purpose for the establishment of the National Park was the protection of the local population of the Persian Gazelle (*Gazella subgutturosa*) and of a number of rare bird species. In recent years, the population of the Persian Gazelle has significantly increased and individuals and herds are now found outside of the Park border, i.e. to the west of the existing M 3. Today, the Shirvan population is the only viable population of Persian Gazelle in Azerbaijan. Despite its growing numbers, the Persian Gazelle is still at the edge of extinction in Azerbaijan. A BP-funded project has been launched in 2003 to re-introduce Persian Gazelles to their former habitats in other parts of the country. The individuals for this resettlement action will be gathered from the population in the Shirvan National Park.

**Human environment**
Settlements in the vicinity of the M 3 are *Xidirli* with about 7,000 inhabitants at around 1.8 km as the crow flies to the SE (~km 84) and *Kürsengi* with about 16,000 people at the end of the project section at about 2.5 km to the NW of the M 3.

**Summary of Significant Environmental Impacts and Mitigation Measures**
The construction of 2 new lanes and associated physical interventions during construction will mainly be restricted to the existing RoW. As the land in the immediate vicinity of the existing M 3 is rather empty and flat semi-desert, no significant permanent adverse impacts on specifically sensitive natural environment are expected as a direct result of project implementation.

The proposed operations will not require involuntary resettlement or involve any other activities of social relevance. New box culverts that will replace small existing bridges have been designed such that their present secondary function as animal crossings will be maintained.

Indirect permanent impacts resulting from the widening of the existing road may affect the local population of Persian Gazelles (*Gazella subgutturosa*) in the Shirvan National Park between km 91 and km 102. In this section the existing M 3 cuts through the natural habitat of this Red Data Book species\(^1\) and runs immediately parallel to the Park, which was mainly established to

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\(^1\) IUCN list and Red Data Book of Azerbaijan
effectively protect the only viable population of Persian Gazelles in Azerbaijan. Following to successful management, conservation efforts and public education the local population of this species is currently growing. Consultations with local officials and specialists suggest that a wider road together higher traffic volumes will increase the risk of accidents with herds or individual animals crossing the road.

To avoid such accident risk for both road users and wildlife underpasses are suggested in 3 locations at Shirvan National Park in combination with a protective fence alongside the Park boundaries. Monitoring shall take place to scrutinize whether or not and to what extent these underpasses are ultimately used by the gazelles.

During the construction period temporary impacts of minor importance and magnitude may occur. Such impacts could be the temporary impairment of traffic safety, the potential pollution of soils, surface and groundwater and air, dust pollution and potential impairment of neighbouring settlements through material transport. Depending on the selected location and design, the contractor’s yard and worker’s camp may be further potential sources of adverse environmental impact.

The purpose of environmental management during construction is to avoid or at least to control and reduce these impacts and potential damage and disturbance to the human and natural environment. This will be achieved through the implementation of appropriate mitigation measures, control procedures and monitoring defined in the Environmental Management Plan (EMP).

At the present planning stage, specific information on the construction method, concrete working arrangements or selection of borrow sites for construction material is not available. Some of this information will be elaborated during the subsequent Detailed Design Stage, but the majority of relevant decisions will only be taken during the mobilisation phase and be the responsibility of the Contractor. According to the provisions of the EMP the Contractor will be required before the commencement of construction (mobilisation phase) to make concrete proposals for environmental protection, including the health and safety of people associated with the works and the safety of the public during construction.

Approval of the Contractor’s proposals will be the responsibility of Road Transport Service Department’s (RTSD’s) ‘Ecology and Safety Sector’ (ESS) and monitoring on the site will be carried out by the District Road Maintenance Units (DRMU) in Alyat-Hajigabul and Salyan.

**Capacity Building**

To support RTSD’s ESS and the DRMUs in successfully carrying out their mandates and to facilitate environmental management during project implementation capacity building will be provided. The ToR for a program of on the job training for the implementation phase of Highway II Project are currently being drafted by the WB. The aim of this support will be to strengthen capacity in ESS and the DRMU to manage environmental and social impacts of highway construction, rehabilitation and implementation.
Public Consultation Summary
A public consultation meeting was held in Alyat on September 23, 2005. The meeting was attended by 29 people from Alyat and Salyan. Local NGOs were informed and invited via the Aarhus Centre by email.

After an introduction by representatives from the local executive power and the distribution of a written project information, the consultant introduced the overall project and explained the purpose of the meeting and the results of the EA study. During the subsequent discussion, the major issue of concern was the question whether the project would also comprise the rehabilitation of some secondary access roads of the M 3. The audience was informed that there are no such plans in the frame of the present project. Another issue of concern was about employment opportunities for local workforce during project implementation.

Regarding the Shirvan National Park, it was confirmed that underpasses need to be built allowing for the free and safe movement of Persian Gazelles. There were some discussions on whether the animals would ultimately use these underpasses and that it would be important to design them such as to make them as attractive as possible to the animals.

The planning team was also informed about very unfavorable ground conditions between km 99 and km 102 of the M 3 which would have to be specifically considered during project implementation.

Conclusions
Summing up, the project-related impacts will generally be of such nature and magnitude that they may be managed or reduced to acceptable levels by the implementation of appropriate mitigation and safeguard measures. The environmental management plan will serve as a reference for the refining of some of the proposals during detailed design and provides the framework for the preparation, organisation and supervision of environmental management during the construction period.

In this context, appropriate timing for capacity building and the conduct of training for the ESS and DRMU will be crucial for the successful organization and implementation of these measures.

During the next planning phase, the detailed design of the new underpasses proposed for biodiversity protection in the section alongside the Shirvan National Park shall be optimised. In this connection, it should also be envisaged to minimize the length of the new underpasses to the possible extent to improve their acceptance by the gazelles. The detailed design for the 3 new underpasses and the required landscaping in their surroundings should be done in cooperation and consultation with local environmental experts who are familiar with the ethology of Persian Gazelles and their specific habitat requirements. By this time, a monitoring programme should also be established in cooperation with these experts to trace the acceptance of the new underpasses. A separate budget for the conduct of a 2 years monitoring program has been included in the cost estimate for the implementation of environmental management measures under the project.
INTRODUCTION

Project Background

The present Environmental Assessment Report (EAR) has been elaborated as part of the proposed IDA loan for the preliminary design of a 22 km section of the 313 km Baku – Alyat – Astara highway (M 3). This project will be the first of several sub-projects planned to be implemented in the frame of the Azerbaijan Motorway Improvement and Development or ‘Highway II’ Project. This ‘Highway II’ Project would include the upgrade of the entire M 3 Motorway by the expansion of the existing 2 lane road to a 4 lane road, and construction of new 4 lane roads and bypasses around key towns.

Fig. 1.1: Location of the Project Road

In connection with the ‘Highway II’ Project a ‘Regional Environmental Assessment’ (REA), ‘Environmental Assessment and Management Framework’ (EA&MF) and ‘Resettlement Policy Framework’ (RPF) have been prepared to facilitate implementation and to ensure that sub-projects will comply with Azerbaijan’s legislation, procedures and policies, international Conventions and WB safeguard policies, in particular in terms of environment, resettlement and land acquisition. These tools have guided the conduct of the present EA study and provided the framework for the elaboration of impact mitigation measures and provisions for environmental management during project implementation.

Regarding the overall corridor between Alyat and Astara the main objective of the ‘Highway II’ Project is to reduce transport costs and improve access, transit and safety within Azerbaijan’s north-south corridor through the implementation of a number of sub-projects involving the upgrading of some sections of the existing M 3. For road users the implementation of the Highway II Project would lead to a better road quality meeting mid-term traffic projections, better safety through new alignments and bypasses of cities, avoiding hazardous crossing of villages by heavy transit traffic, lower travel costs and a shorter travel time. The upgrading of this 22 km section will be the first sub-project to be implemented under Highway II. Construction works are planned to commence in spring 2006 and to last for about 18 months. Opening of the improved road facility to traffic is planned for the beginning of 2008.
According to the traffic study for this section the average annual daily traffic is estimated at 5,663 in 2005. The average annual change is estimated at 13.39% in the period 2005 – 2008. Between 2008 – 2013 the annual change is expected at around 8.10% and at 5.78% between 2013 and 2023.

For environmental assessment purposes the road section under study has been classified as a Category B project under the provisions of World Bank's (WB) Operational Policy (OP) 4.01.

Objective and Scope of the Study
The objective of the present Environmental Assessment (EA) is to address the environmental impacts and management issues deriving from the proposed interventions. According to OP 4.01 an environmental management plan (EMP) is a mandatory element of each EA report (EAR). The EMP consists of two sections: the environmental mitigation plan identifies measures that must be carried out as a part of the project to reduce potentially significant adverse environmental impacts to acceptable levels and assigns institutional responsibilities for the implementation of these measures. In its monitoring section the EMP provides a specific description of monitoring requirements and specifies the type of monitoring regarding the impacts assessed in the EAR and the mitigation measures that are proposed.

According to the ToR for the conduct of the present study social impacts shall also be addressed in the EAR. However, the planned interventions – except borrow pit or quarry operations and the set-up of contractor’s yard and work camp - will be physically restricted to the Right of Way (RoW). As the entire road section passes through uninhabited land, private property will not be affected and no land acquisition or compensation required. Therefore, social issues will not be discussed in the frame of the present EA study.

POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK
National EA Policy and Procedures
The EA system in Azerbaijan is characterized as a ‘dual’ system which currently contains elements of the SER (State Ecological Review) system inherited from the former USSR and elements of a ‘classic’ EA system incorporating the best EA practice as understood in developed countries.

SER is a mechanism by which the state authorities verify conformity of virtually all proposed economic activities to environmental requirements. The procedure is supported by the national framework of environmental legislation and does not require the consideration of alternatives or mitigation measures nor does it explicitly define the content of an EAR. As implied by the nature of SER it largely focuses on verifying compliance of the proposed activity to environmental standards and rules and provides for very limited public participation\(^2\).

The ‘classic’ elements are supported by the procedures that are laid down in the ‘EIA Handbook for Azerbaijan’\(^3\). This Handbook does not have a legal status, but is currently considered as binding by the Ministry of Ecology and Natural Resources (MENR) as the competent Authority. It is understood from discussions with MENR’s SEE in August 2005 that a new guidance document for EIA is in the process of being prepared. The main difference between the existing guidance and the future one is the provision for public involvement in the EIA process and a screening list for projects requiring EIA. Legal status is also envisaged for this document through approval by the Cabinet of Ministers. The policy of involving the public in the

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assessment of environmental impact is one of a range of measures included in the Azerbaijan State Programme on Poverty Reduction and Growth (SPPRED) due for implementation in the period 2003-2005.

According to the provisions of this Handbook the EA process is applied to all development proposals in principle. The official procedure commences with a formal application based on which the MENR will determine the scope of environmental investigation to be conducted. If a full EA process is required, then the scope of the EA investigations will be determined after a scoping meeting which is convened by the MENR with the participation of the developer (in the present case RTSD).

After the completion of investigations and consultations the developer submits his EA report to the MENR for approval. The MENR makes the EA report available to the general public and submits it to the Environmental Review Expert Group which will conduct its own investigations and produce a review document that is submitted to the MENR. The official approval of the project may be subject to conditions which can relate to any phase of the project. On accepting the permission the developer also accepts the conditions attached to the permission which then become legally binding. In this context one of the standard conditions of the permission will be that the developer is responsible for monitoring certain set parameters to ensure that the predicted activities comply with the set conditions and that the environmental impacts are within the predicted and acceptable limits. While the prime responsibility for monitoring will lie with the developer, the MENR is required to carry out surprise inspections to check on the accuracy and reliability of the developer’s monitoring results.

MENR would review the EA report within a maximum of 60 days after receipt of the report. Three versions in Azeri and one in English should be submitted.

Legal and Regulatory Framework
The formal obligation to predict and mitigate potential environmental impacts resulting from road construction is based on the provisions of the Law of the Republic of Azerbaijan on Environmental Protection (February 1999) and the Law on Automobile Roads (March 2000). The following table 3-1 provides an overview of these and other relevant acts in the legal and regulatory framework. A short description of the specific application of these provisions in road construction is also given. Environmental issues of international concern (e.g. international environmental treaties or conventions) or trans-boundary issues of environmental importance will not be of concern for this specific project.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Description</th>
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<tbody>
<tr>
<td>The Law of the Republic of Azerbaijan on Environmental Protection (Febr. 9, 1999)</td>
<td>General framework for all national objectives in the area of environmental protection</td>
</tr>
<tr>
<td>Article 50: State Ecological Expertise (SEE)</td>
<td>Requirement to identify impact on the environment caused by any activities, to examine the results of such impacts and predict possible impacts in accordance with the environmental requirements and qualitative parameters of the environment.</td>
</tr>
<tr>
<td>Article 54: Objects of the State Ecological Expertise</td>
<td>Defines the types of projects requiring compulsory SEE, i.e. to undergo the systematic EIA process. The construction of a new road is not explicitly stated.</td>
</tr>
</tbody>
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| Articles 35, 36, 37 and 38: Ecological Requirements During Project Design and Implementation | It should be confirmed that the project will comply with:  
  - the maximum permitted concentrations of pollutants in the environment;  
  - the maximum permitted discharges and emissions of pollutants into the natural environment;  
  - the maximum permitted noise and vibration levels and other harmful influences as well as health norms and standards of hygiene. |
| Azeri Law on Automobile Roads (March 10, 2000) | Spells out that any construction or reconstruction of roads requires the official approval of the Ecological Committee⁴, that state of the art technology must be applied and that the chemicals that are 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. |
| EIA Handbook for Azerbaijan (UNDP), 1996 | Regulations on EA in Azerbaijan which define the type of projects requiring EA, the contents of an EA document, the roles and responsibilities of the developer and the competent national authorities, the procedures for public participation and the appeal process. |
| 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); |
| 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). |
| 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 specifically claims that workers need to be informed and trained about sanitation and health care issues and the specific hazards of their work. |

⁴ now Ministry of Ecology and Natural Resources
### 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 the consideration of appropriate protection measures, which shall contribute to the maintenance of stable ecological and geological conditions as well as the natural balance.
  
- **Part III: Protection of the Environment**
  - Provides a 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 in road construction such as use of soils, protection 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.

### 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.

### GOST 13508-74

- Describes the requirements and standards for white lining for the various road categories.

### WB Policy

As regards WB procedures, the Project has been classified as a ‘Category B’ project under the provisions of the OP 4.01. According to these provisions the EA for a Category B requires to provide an environmental management plan (EMP) and to consult with the potentially affected public at least once, when a draft EAR is prepared (see Chapter 10).

Moreover, the requirements of the relevant WB Operational Policies (OP) and the Handbook on disclosure and information have been considered.

### Administrative Framework

The Government of Azerbaijan is represented in the regions by the local offices of line ministries which in some cases may cover more than one district. In this present project, the Ministry of Transport, represented by Road Transport Service Department (RTSD), is the main stakeholder due to their responsibilities in road construction, operation and maintenance.

In managing and monitoring environmental implications of the proposed Project the following national and district agencies will be involved:

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5 According to WB’s OP 4.01 a proposed project is classified as Category B if it is likely not to have significant adverse environmental impacts and if these impacts are likely to be site-specific. EA for a Category B project 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. Moreover WB procedures for public information and disclosure shall apply.

6 Operational Policy on Environmental Assessment (OP 4.01, January 1999);
   Operational Policy on Natural Habitats (OP 4.04, June 2001);
   Operational Policy Note on Management of Cultural Property in Bank Financed Projects (OPN 11.03, August 1999);
   The Disclosure Handbook (December 2002).
RTSD is responsible for planning, constructing, operating and maintaining national roads in Azerbaijan. RTSD's Project Implementation Unit (PIU) will be in charge of project management to ensure that appropriate budget is provided for the implementation of mitigation measures and monitoring programme and that the contract provisions are properly implemented. The Environment and Safety Sector (ESS) under RTSD's Maintenance Unit will coordinate EA studies including associated consultation, oversee the practical implementation of the EMP, coordinate consultation and disclosure and liaise with relevant ministries and agencies. The ESS is also responsible for liaison with the relevant ministries and agencies regarding environmental approval and clearances.

The district offices of RTSD (District Road Maintenance Units in Alyat – Hajigabul and in Salyan) will be responsible for the day to day supervision of construction and oversight of the implementation of environmental management plans during project implementation.

The Sanitary and Epidemiology Department of the Ministry of Health (MoH) will be responsible to undertake routine monitoring of the living conditions and sanitary provisions at the contractor’s work camp and worksites. MoH's District Disinfection Centre will have to be involved to officially approve the contractor’s work camp installations and facilities and their compliance with the relevant sanitary and health norms and guidelines.

The Inspection section of MENR's Regional Monitoring Department in Salyan may carry out surprise checks regarding the compliance of operations with the relevant national environmental standards and regulations.

During the operational phase of the Project RTSD will undertake routine monitoring on road safety, the storm water drainage system, the condition of plantations, etc. and will also be responsible for monitoring during routine maintenance operations.
PROJECT DESCRIPTION
The present section is located at about 5 km to the south of Alyat between km 80 and km 102 of the M 3 Motorway. In this section it is proposed to widen the existing 2 lane motorway to 4 lanes within the existing Right of Way (RoW).

The preliminary design features are as follows:

- maximum width of the road: 27.5 m
- carriageway width: 15 m (2x7.5m)
- number of lanes: 4
- width of shoulder: 3.75m (2x3.75m) of which 2.5m (2x2.5m) should be paved with asphalt concrete
- slope ratio: 1:3 if possible
- cross-fall in the carriageway: 2%
- cross-fall in the shoulders: 4%
- width of median: 5.0 m.

Where animal crossings existed they will be replaced by such structures that allow to maintain this function in the future.

The existing bridge over the Shirvan Main Collector will be replaced by a new one with improved design and safety standard (Fig. 3.1).

Fig. 3.1 Cross Section of the new bridge over the Shirvan Main Collector

The road furniture and marking will be according to national standards for a Category I road.
Environmental Baseline

Physical Environment

The landscape of the project area is determined by its vicinity to the western coast of the Caspian Sea and its location in the Kura – Araz lowlands. The land in this lowland zone is a monotonous wide and flat plain extending along the Caspian Sea in a strip of 10 to 40 km width. The numerous drainage channels located to the left of the M 3 are the remainders of the former irrigation system for cotton plantations which was built during the soviet period. Following to structural changes in agriculture these channels have now been abandoned and successively fall into disrepair. Today, the land is mainly used for animal husbandry in its traditional extensive form. Altitudes in the project area range between –28 and 0 m. The only natural elevation in the area are two mud volcanoes: Gushkhana located at about 1-1,5 to the west of km 81, where oil prospecting works occur and a second one located near the village Kürsengi, which is some 100 m high and located at 75-100 m to the west of the M 3.

The climate in the Kura – Araz lowlands is characterized by dry sub-tropical and semi-desert – steppe climate with very hot summers and moderately warm winters. The average annual rainfall is 200-300 mm with rainy seasons in spring and autumn. Average annual temperature is 14.5°C with 24-26°C in summer and 4-6°C in winter. Absolute maximum is +41°C and minimum –22°C. Average annual evaporation is 800-1000 mm, humidity is 31-50%. In the area around Alyat the prevailing direction of wind during both summer and winter is north. Strong winds are rather frequent here, sometimes reaching speeds of 30 m/s.

Soils in the study corridor are meadow grey soils (Sierozem) which include loam, sandstones, sea-shell limestone etc. The basis for these soils are soft quaternary sea sediments like loam, sands and materials from the surrounding mud volcanoes etc.. Meadow grey soils are generally characterized by low moisture and humus content and locally contain high salt concentrations. However, in case of good irrigation these soils may be very productive.

Groundwater conditions in the project area are mainly influenced by the Caspian Sea and continental quaternary sediments. In the area of Salyan lowlands ground water levels are at about 3 m, very rarely at 3-5 m. The natural groundwater level has been lowered through the collector-drainage system, which criss-crosses the landscape especially in the west of the road. The degree of mineralization is 2.7 g/l or 0.7-1 g/l on some places. Due to its high salinity this groundwater is not suitable for drinking water purposes or economical use.

Natural perennial streams or rivers do not exist in the project area. The Shirvan Main Collector crosses the road at about KM 90.5 and is the main surface water in the study corridor. The water in this collector originates from the northern parts of Kura-Araz lowland (Shirvan region, north of Kura River) which is irrigated with water from the Kura/ Mingachiviv Water Reservoir. The water quality in the collector is characterized by high silt loads, relatively high salinity and reported to be polluted by chemicals from agriculture. However, pollution levels have generally decreased following to the decline of cotton production, which was the main consumer of agrochemicals in Azerbaijan. The Shirvan Main Collector drains into the Caspian at about 14.5 km as the crow flies to the south-west of the M 3. Temporary streams and shallow ponds occur at depressions at various locations and depending on the precipitation, mainly during 4 to 6 weeks during spring.

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Natural Environment

The flora in the study corridor is formed of dry saltwort and ephemeral desert and wormwood-saltwood semi desert species (including halophytes) with annual and perennial grasses forming more than 90% of the vegetation. The predominant grass species in this area are *Artemisia hanseniana* and *Salsola dendroides*. Woody-shrubby vegetation accounts for less than 10% of the vegetation. Small Tamarix shrubs (*Tamarix sp.*) are widely distributed in the vicinity of the road in more humid locations. Another typical shrub of the area is *Salsola dendroides*. In result of intensive grazing some secondary plant species have sharply expanded their habitat. An example for this is Camelthorn (*Alhagi camelorum*) which has a wide distribution in the most dry areas which are used as grazing grounds by domestic animals.

Regarding the fauna there are no specifically valuable habitats in the immediate vicinity of the existing M 3. The sparsely vegetated semi-desert land is the habitat of common species of amphibians like the toad (*Bufo viridis*) and frog (*Rana ridibunda*) which breed in some temporary shallow water ponds in spring and survive in the underground during the dry periods of the year. The area is also a most suitable habitat for reptiles such as two tortoise species as well as numerous lizards and snakes. Red Data species among the reptiles are: *Testudo graeca*, *Emys orbicularis* and *Phrynocephalus helioscopus*.

Regarding the avifauna in the surroundings of the project road there are typical and common dry semi-desert species like *Galerida cristata*, *Melanocoripha calandra*, *Oenanthe finchii*, *Coracias glandarius*, *Merops apiaster*, *Falco tinnunculus* etc.. More important bird habitats are some smaller wetlands, which are mainly overgrown by reed and located in the south of the Shirvan Main Collector inside Shirvan National Park (beginning at about 300-500m to the south of the M 3 at around km 91 and extending further to the south-east in the vicinity of the Shirvan Main Collector). During spring there wetlands are the temporary feeding habitat of numerous species, including species listed in the Red Data Books of Azerbaijan and IUCN. This can be explained by an important bird migration route that passes over this territory and that attracts huge populations of birds during March-July. Approximately half of the species that may temporarily be encountered in these wetlands are migratory bird like e.g. *Nycticorax nycticorax*, *Areola ralloides*, *Ixobrychus minutus* and *Anas querquedula*. The most important Red Data species are *Phalacrocorax pygmaeus*, *Aythya nyroca*, *Haliaeetus albicilla*, *Aquila heliaca*, *Tetrax tetrax* (World Red Data Book) and *Phoenicopterus ruber*, *Francolinus francolinus*, *Porphyrio porphyrio*, (Azerbaijan Red Data Book). During the second part of summer these wetlands fall dry.

Typical mammals that may occur in the surroundings of the M 3 include common species as are hedgehog, some bats, hare, predators like wolf, fox and jackal as well as species listed in both the IUCN list and Azerbaijan Red Data Book like the Sand Gazelle or Persian Gazelle and *Vormela peregusna* (Azerbaijan Red Data Book).

The Shirvan Main Collector contains many fish species that local people use for both, personal supply and commercial purposes. Although officially prohibited much of the fishing is done by nets, which are stretched in the collector. Common fish species include the carp *Cyprinus carpio*, *Caspioctrain wagneri* (Red Data Book of Azerbaijan), *Barbus lacerta*, *Chalcalburnus chalcoites*, *Lucioperca lucioperca*, *Aspius aspius* and others. Moreover, the collector has importance as spawning ground for some sea fishes such as *Rutilus cupium*. However, intensive fishing in the collector represents a strong impairment for the habitat potential of this stream.

Protected Areas

The Shirvan National Park is located to the south-west of the M 3 between km 90.5 and km 102 to the east of the M 3. It was founded in 1969 as Shirvan State Reserve. At a later point of time the territory of the Bandovan Sanctuary was added to the reserve area and enlarged for the development of the National Park. The Park's present territory is about 66,000 ha, located on the territory of Salyan district. In the north the Park boundaries are determined by the Shirvan
Main Collector, in the east by the Caspian Sea, in the west and south by smaller water canals. The western Park boundaries run very close to the existing M 3. The landscape of the Park is formed by semi-desert, wetland (brackish lakes) and sandy coastal zones. Lake Shorgyol originates from overflows from the Shirvan Main Collector.

The main purpose for the establishment of the National Park was the protection of the local population of the Persian Gazelle (Gazella subgutturosa) as well as the protection of wintering, breeding and migratory birds: Flamingo, Ferruginous Duck, Purple Gallinule, Little Bustard, etc. The main threats to this habitat are unstable water levels and drying of the lake. In recent years, the population of the Persian Gazelle has significantly increased and individuals and herds are now found outside of the Park border, i.e. to the west of the existing road.

The Persian Gazelle (Gazella subgutturosa) was distributed throughout Kura-Araks last century and also inhabited the whole of the Absheron peninsula. The most numerous populations were on the Karabakhi steppe, in Shirvan National Park and Korchai and Bendovan Reserves. In 1996, only 4,000 to 4500 individuals remained on the territory of Azerbaijan. As a result of intensive conservation efforts and education campaigns their numbers have presently increased and are estimated to be at about 5000 to 5,500 heads in Shirvan National Park alone. Today, the Shirvan population is the only viable population of Persian Gazelle in Azerbaijan. The main threats to the species are habitat destruction for farming purposes, pressure on grazing grounds by the competition of sheep and poaching. In Azerbaijan, the Persian Gazelle is at the edge of extinction. It is included in the National Red Data Book and in the IUCN List of globally threatened species. A BP-funded project has been launched in 2003 to re-introduce Persian Gazelles to their former habitats. This goal shall be achieved by two strategies:

- Active re-settlement from Shirvan National Park to Aggol National Park and

**Human Environment**

The closest settlement is Xidirli, which has a population of about 7,000 and is located at around 1.8 km to the SE of km 84. Kürsengi settlement comprises 6 or 7 villages which all together have a population of about 16,000. Kürsengi is located at the end of the project section at about 2.5 km to the NW of the M 3.

On the project road itself two bus stops are located at the junctions of the M 3 with the access roads to Xidirli and Kürsengi. Both these facilities are in a bad state of repair.
Potable water is not locally available in either Xidirli or Kürsengi. In Xidirli, drinking water is currently supplied via a pipeline from Kura River. Kürsengi receives water from an irrigation channel which does not regularly provide water and the local population largely depends on water trucks for their drinking water supply.

ENVIRONMENTAL IMPACTS

The construction of 2 new lanes and associated physical interventions during construction will be restricted to the existing RoW. As the land in the immediate vicinity of the existing M 3 is rather empty and flat semi-desert no significant permanent adverse impacts on specifically sensitive natural environment are expected as a direct result of project implementation.

Potential averse environmental impacts resulting from the implementation of the project and the operation of the 4 lane road will mainly be temporary, i.e. restricted to the construction phase. A quantification of these potential impacts is not possible, but it is expected that they will be of such nature and magnitude that they may generally be controlled by the implementation of standard environmental management measures. To this regard appropriate contractual arrangements and control mechanisms need to be established to prevent or at least minimize the pollution of soil, water and air and to adequately control potential impacts related to material exploitation and transport. Another important issue to be considered is traffic safety, regarding both workers as well as road users during construction.

The closest settlements are Xidirli at around 1.8 km and Kürsengi at about 2.5 km to the NW of the M 3. In the absence of potential ‘receptors’ in the vicinity of the road there will be no requirement to specifically foresee precautionary measures for the minimization of noise and vibrations and compliance with the relevant standards for the protection of human settlements.

The proposed framework for environmental management is presented in the EMP which will be overseen by RTSD’s ESS, implemented by the Contractor and monitored by the DRMUs in Alyat Hajigabul and Salyan (see Appendix 1).

As regards road design, specific measures for wildlife protection are proposed in the section which runs in parallel to the Shirvan National Park (km 91 – km 102). As was explained in Chapter 4, the existing M 3 cuts through the natural habitat of Azerbaijan’s only viable population of the Persian Gazelle (Gazella subgutturosa Guld\(^9\)). The potential impacts resulting from project implementation were intensively discussed with the Park Administration and local experts from the Azerbaijan Academy of Sciences (see Appendix 2). It was concluded that the existence of a wider road with faster and growing traffic has potential to result in increased numbers of accidents in this road section. This would be a permanent long-term adverse impact affecting both, the local population of a globally threatened species and at the same time affect the safety of road users. To alleviate such risk, concrete measures are suggested in Chapter 6.

ENVIRONMENTAL MANAGEMENT PLAN

General

The purpose of environmental management during construction is to control, reduce or avoid potential damage and disturbance to the human and natural environment. This can be achieved through the implementation of appropriate mitigation measures, the application of

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\(^9\) Gazella subgutturosa is included in both, the Red Data Book of Azerbaijan and the IUCN List of globally threatened species
control procedures and the conduct of monitoring determined in the Environmental Management Plan (EMP).

At the present stage, specific information on the construction method, detailed working arrangements, the number of people to be employed, the selection of sites for the Contractor’s yard / work camp or the selection of borrow sites for construction material is not available. Some of these issues may be identified during the subsequent Detailed Design Stage (e.g. through special specifications / clauses and separately costed items in the tender documents), but the majority of relevant decisions will be taken by the Contractor himself during the mobilisation phase. The Contractor will take all reasonable steps to protect the environment on and off site to avoid damage or nuisance to persons or to property arising from his operations.

During the mobilization phase the Contractor will be required to submit a series of method statements and proposals that will specify details on his proposed working arrangements and environmental management during construction. The requirement to elaborate these statements will be specified in the bidding documents.

In this context the following measures are advocated as good practice:

- Location of machinery and haul roads as far from dwelling areas as possible, aiming to minimize the number of people directly affected by air pollution, noise and disturbance during construction;
- Careful selection of access routes to/from the construction site and from borrow pits, aiming to minimize journey distance and the number of dwelling areas affected, bypassing communities wherever possible;
- Lorries transporting loose and dry materials should be covered to avoid dust pollution and wheel washes installed at the exits of the construction site to prevent mud on the road;
- Dust control measures should be used on stockpiles of earth and other dry loose materials, primarily by dampening down with water – seeding or turving of longer-term stockpiles is appropriate;
- There should be no burning of material on site;
- Fuel storage tanks and any other polluting materials, such as construction waste or hazardous waste, should be stored in covered containers on a sealed area such as hard-standing areas and preferably surrounded by a bound to contain any accidental spillage.
Environmental Mitigation and Monitoring Plan

The EMP provided in Appendix 1 consists of (a) a mitigation plan describing a set measures to be implemented during the construction phase and (b) an environmental monitoring plan setting out proposals for monitoring implementation of the environmental mitigation measures during the construction phase.

Monitoring will allow for the immediate identification of problems and corrective action to be undertaken by RTSD.

Regarding road design, the following mitigation and environmental enhancement measures have been integrated into the project:

- All 7 small bridges existing in the project road will be replaced by new box culverts. The span of these box culverts will be such, that all existing animal underpasses will be maintained as such\textsuperscript{10}. The bridge over the Shirvan Main Collector will be replaced by a new structure with improved design and safety;

- At km 93.5 and km 97 new underpasses / box culverts of 4.0 m width and 2.5 m height are proposed. These locations had been indicated by the Management of the National Park as ‘traditional’ crossing points of Persian Gazelles. The new underpasses shall facilitate the free and safe movement of Persian Gazelles from Shirvan National Park and support their natural expansion to new habitats. At km 100.2 an existing culvert of 2,00m x 2,00 m will be replaced by a new box culvert of 4,00 x 2,5 m to serve the same purpose. During the subsequent planning phase the detailed design of these box culverts shall be refined such as to facilitate their acceptance by the animals. This should comprise but may not be limited to the detailed design of in- and outlets. Moreover it should be considered to minimize the length of the underpasses by appropriate design measures. Another important issue to consider is the fact that the present horizontal alignment of the existing M 3 implies some constraints for the height of the new box culverts. This may be solved by landscaping the surroundings of the new structures. Regarding these issues the the detailed design consultants should closely cooperate with the Park Management and local environmental experts who are familiar with the ethology of Persian Gazelles and their specific habitat requirements.

- A solid fence of minimum 2.5 m height will be provided alongside the Park boundaries between km 90.5 and km 102, to prevent gazelles and other wildlife from crossing the road and to direct them to the underpass (see fig.6.1 below);

- Monitoring should also be carried out to trace the acceptance of the new underpasses by Persian Gazelles and to allow for potentially required corrective action after implementation. For this purpose a concrete programme should be established during the detailed design phase in cooperation with the same experts. Reporting arrangements fort the communication of results should be determined in cooperation with the competent department of the MENR. A separate budget for the conduct of a 2 years monitoring program has been included in the cost estimate.

- The median of the upgraded road will be 5 m wide and planted with a double row of local species of shrubs which are adapted to the local climatic and soil conditions and require relatively little watering in the initial growing period. After a few years these plantations may contribute to improved road safety by reducing the risk of vehicle headlights dazzling oncoming drivers during hours of darkness;

- Tree plantations are proposed around the bus stops on the junctions to Xidirli and Kürsengi;

- The top soil stripped from the construction site shall be re-used as far as possible in the median where shrubs will be planted. To support the successful growth of these new

\textsuperscript{10} Per definition an animal underpass is requires a minimum span of 4 m
plantations a hollow should be formed in the median to allow for the accumulation of water. The remaining top soil will be reused on the embankment slopes of the upgraded road.

The costs for the implementation of these measures are provided in Chapter 9.

**Fig. 6.1: Sketch of the proposed fence alongside Shirvan National Park**

Prior to the beginning of construction the Contractor will make proposals / method statements for the protection of the environment, the health and safety of persons associated with the works and the safety of the public. These proposals will be submitted to RTSD’s ESS for review and approval. In this regard the following will be provided by the Contractor:

1. A method statement on how he intends to maintain conditions of safety for all persons entitled to be on site and for traffic control and safety throughout all stages of construction (adequate signalisation, traffic safety signs, barriers, flag persons for traffic control, appropriate lightening of construction sites during the night for the safety and the convenience of the public); and to provide information to the public about the schedule and scope of construction activities;

2. A statement on accident, fire and chemical spill containment / emergency procedures;

3. A proposal on the siting and organisation of the contractor’s yard / work camp including proposed measures to avoid or reduce adverse environmental impacts resulting from its installation and operation; this would include a description of fuel storage and its location, and of the filling station and vehicle washing site; at these sites the Contractor will have to provide secure impermeable and bounded compounds to store chemicals and oil distant from any surface waters;

4. A waste management plan for the operation of the contractor’s yard and worker’s cam which consider the separate collection of toxic and harmful waste as well as tires to be handled in cooperation with an approved, authorized partner according to the relevant regulatory provisions and disposed of at designated sites. The waste management plan shall include an estimate of the types and quantities of waste matter, other residual materials, and the rate at which these will be produced. The methods by which the quantities of residuals and wastes were estimated should also be indicated. The plan should also include appropriate arrangements for the local storage and transport of this waste (as appropriate).
5. A layout plan of the site of the mixing plant and a method statement on the technology for bitumen storage and transport to the mixing plant and for the handling of bitumen spills;

6. A layout plan of the borrow pits for gravel and sand extraction and a method statement on the proposed work technology (crushing technology, measures for the minimization of waste) and material transport;

7. A layout plan of the borrow pit for fill material extraction, transportation method / route, rehabilitation of the borrow pit and methods proposed for the minimization of adverse environmental impact;

8. A method statement for the organization and execution of bridge construction works (Shirvan Main Collector);

9. Implementation of other technological processes according to standard requirements for the minimization of wastes and discharges;

10. A method statement on the management of dust and noise from material transport including indications on the proposed haul routes and the distance of these haul routes to the nearest houses / settlements;

11. A method statement on the proposed methodology for bridge construction over the Shirvan Main Collector and the proposed measures for the avoidance of surface water pollution.

Upon approval of these proposals / method statements the ESS shall forward the documents to the DRMU in Hajigabul-Alyat and Salyan and to the Construction Supervision Team for their further consideration and monitoring during construction.

Institutional Arrangements And Reporting

The Contractor will provide monthly reports to the PIU / ESS which document the environmental mitigation and protection measures carried out during the reporting period. The same will be done by the RTSD’s relevant DRMUs for their area of responsibility. Any endangerment of the environment should be immediately reported.

An agreement with Traffic Police on regular (monthly or quarterly) reporting should also be made.

The DRMU will carry out regular monitoring according to the approved method statements and the EMP provisions and report monthly to the ESS. These reports will encompass lists and explanation of all undertaken activities at the site as well as recommendations for future field activities and protection measures.

It may be necessary to ensure that RTSD’s District Road Maintenance Units (DRMU) will coordinate with MENR on special occasions when their institutional capabilities are becoming limited to deal with complicated problems. For this purpose a coordination mechanism may be established between the relevant DRMUs and MENR’s Regional Monitoring Department (regional inspection section) in Salyan to provide short and effective communication channels.

RTSD’s ESS will prepare quarterly Environmental Monitoring Reports for submission to the PIU according to the information received from the DRMU’s and the Traffic Police. In these reports the ESS will resume information gathered in the field and evaluate effectiveness of the mitigation program. Part of the report will concentrate on possible future mitigation and monitoring activities that could be utilized to assure better quality of the environment.

During project implementation, the PIU will report to the WB every six months on the progress of the project by submitting a brief statement on the status of environmental compliance under the project through the Project Summary Report (summary of the environmental protection measures implemented by the Contractor, problems encountered, actions taken to resolve environmental problems).
In case of lack of compliance, RTSD and MENR will outline remedial measures to be employed to facilitate full compliance. The outline of the report to be submitted to WB is indicated in the EA&MF prepared for the Highway II Project.

Supervision of project implementation by the Bank will include a review of compliance with the findings and recommendations of the EA and progress with implementation of the EMP.

**Environmental Management During Operations**

During the operational phase two components will have to be considered:

- **Pollution Incident Plan**
  Before the completion of road construction works the ESS shall set up a Pollution Incident Plan to be implemented by the DRMU to deal with emergency situations, such as accidental spillage of oil, fuel or hazardous materials as the result of collision.

- **Environmental Monitoring Plan**
  The Environmental Monitoring Plan prepared and implemented during the construction phase should be expanded based on that experience. The monitoring plan for the operational phase should also include monitoring post-construction during the first year of operation so that action may be taken if any detrimental effects occur.

During the defects liability period DRMU will also monitor and report on the condition of the new plantations provided under the Project in parts of the median and on the bus stops.

**CAPACITY DEVELOPMENT AND TRAINING**

The issue of the RTSD’s ESS present managerial capacities and limited environmental / social background and experience in all EIA-related matters has been addressed recently in the frame of various WB and ADB funded EA reports and the REA&MF for the Highway II Project.

Moreover, RTSD itself brought this aspect to the attention of the WB and asked for assistance in strengthening ESS’s technical capacity to manage the EIA process related to highway rehabilitation and development. In response to this request, the WB is currently preparing a ToR for a program of on-the-job training. This will be a practical program that shall raise awareness of (i) national and WB environmental assessment and management requirements, (ii) the impacts associated with highway construction and their management; and (iii) support ESS with the development and implementation of procedures for environmental management and monitoring. The training is planned to start as soon as possible so that the relevant staff will have received training before the loan becomes effective in February 2006. Follow on capacity building is planned during sub-project implementation (see below).

While ESS is mainly involved in project preparation and coordination, RTSD’s DRMU has an important role to play during project implementation and the operational phase of the road (see Chapter 2.4). According to RTSD there are sufficient numbers of staff available in their relevant district offices, but so far nobody has been specifically appointed for environmental monitoring during road construction or operation, nor is there any relevant practical knowledge or skills available among this staff with regard to environmental management.

To fill this gap (inherent in all future sub-projects under ‘Highway II’) the WB is currently drafting ToR for additional training which will specifically target the implementation phase of the Highway II programme. The aim of this support will be to strengthen capacity in ESS and the DRMU to manage environmental and social impacts of highway construction, rehabilitation and implementation.
Regarding the present project RTSD should as soon as possible select and appoint staff from the relevant DRMU in Alyat-Hajigabul and Salyan to attend this training and to be responsible for the monitoring of EMP implementation during the construction phase.

**Implementation Schedule**

Training for RTSD’s ESS and the relevant DRMUs should be completed during the early stages of project implementation, i.e. before the beginning of the Contractor’s mobilisation phase.

During the mobilisation phase the Contractor will have to submit to RTSD’s ESS a series of method statements for their review and approval (see Chapter 6.3).

Monitoring activities will take place during the construction phase of the project in order to assure the effective protection of the environment and performance of works in compliance with the relevant national regulations and standards and in accordance with the provisions of the EMP.

Implementation of mitigation measures and the majority of the monitoring activities will run parallel to the physical activities on the construction site. They will commence at the time when workforce, equipment and materials are moved to the site and will end after construction is completed and all staff, equipment and materials are removed from the site and the work in the road section is completed. If required, monitoring could also be extended to the period after completion of construction works, e.g. in the case of waste material removal and disposal.

During the operational phase of the Project, monitoring will mainly run together with maintenance activities. These activities will be planned after completion of construction works.

During the detailed design phase a monitoring program for the acceptance of the new animal underpasses at Shirvan National park will need to be established. Monitoring itself will take place after the completion of all construction works and should last for 2 years.

The following table summarizes the relevant issues and attributes them to the stages of project implementation.
Table 8.1 Overview of Implementation Schedule

<table>
<thead>
<tr>
<th>Period / Phase</th>
<th>Issue</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detailed design</td>
<td>Establishment of monitoring program for Persian Gazelles / use of new underpasses in Shirvan National Park</td>
<td></td>
</tr>
<tr>
<td>Mobilisation/ Before the beginning of construction</td>
<td>Training for RTSD’s ESS and DRMU to be completed before the beginning of mobilisation phase</td>
<td>once</td>
</tr>
<tr>
<td>During the mobilisation phase</td>
<td>ESS to review and approve contractor’s method statements and forward them to the relevant DRMU / the Construction Supervision Team</td>
<td>once</td>
</tr>
<tr>
<td>During construction</td>
<td>Monitoring</td>
<td>see monitoring plan</td>
</tr>
<tr>
<td>During construction</td>
<td>Reporting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Contractor to PIU / ESS</td>
<td>monthly</td>
</tr>
<tr>
<td></td>
<td>• DRMU to PIU / ESS</td>
<td>monthly</td>
</tr>
<tr>
<td></td>
<td>• Traffic Police to ESS</td>
<td>monthly or quarterly</td>
</tr>
<tr>
<td></td>
<td>• ESS to PIU</td>
<td>monthly</td>
</tr>
<tr>
<td></td>
<td>• PIU to WB</td>
<td>every six months</td>
</tr>
<tr>
<td>During Operation</td>
<td>Monitoring of Persian Gazelles: use / acceptance of new underpasses Reporting arrangements and schedule to be defined in co-operation with competent Dept. of MENR</td>
<td>Regularly according to monitoring programme</td>
</tr>
</tbody>
</table>

Cost Estimate

The following table provides a cost estimate of the measures that are proposed to mitigate potential adverse environmental impacts associated with the design of the upgraded road. These costs will be included in the Contractor’s civil work’s package. Moreover, costs for environmental enhancement measures (plantations) and a monitoring programme for the acceptance of the new underpasses for Persian Gazelles are considered.

Table 9.1 Environmental Enhancement and Mitigation Costs (in US $)

<table>
<thead>
<tr>
<th>Item</th>
<th>unit</th>
<th>quantity</th>
<th>unit cost</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental Mitigation Measures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New animal underpasses (box culverts) 4 x 2.5 m</td>
<td>no.</td>
<td>3</td>
<td>52,000</td>
<td>156,000</td>
</tr>
<tr>
<td>Inlet / outlet structure for box culvert</td>
<td>no.</td>
<td>6</td>
<td>4,265</td>
<td>25,590</td>
</tr>
<tr>
<td>Landscaping around the 3 new underpasses</td>
<td>no.</td>
<td>3</td>
<td>10,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Protective fence alongside Shirvan National Park</td>
<td>m</td>
<td>10,500</td>
<td>15</td>
<td>170,000</td>
</tr>
<tr>
<td>Top soil stripping</td>
<td>m³</td>
<td>78,540</td>
<td>2</td>
<td>157,080</td>
</tr>
<tr>
<td>Re-use of topsoil in the median</td>
<td>m³</td>
<td>33,000</td>
<td>2.5</td>
<td>82,500</td>
</tr>
<tr>
<td>Re-use of topsoil in road sides/embankment slopes</td>
<td>m³</td>
<td>45,540</td>
<td>6.0</td>
<td>273,240</td>
</tr>
<tr>
<td>AIDS awareness campaign</td>
<td>lumpsum</td>
<td></td>
<td></td>
<td>3,000</td>
</tr>
<tr>
<td><strong>TOTAL Environmental Mitigation Measures</strong></td>
<td></td>
<td></td>
<td></td>
<td>897,410</td>
</tr>
<tr>
<td><strong>Monitoring program</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 years program for the control of acceptance of new underpasses by Persian Gazelles (to be assigned to local experts)</td>
<td>years</td>
<td>2</td>
<td>20,000</td>
<td>40,000</td>
</tr>
<tr>
<td><strong>Environmental Enhancement Measures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plantations in the median</td>
<td>no.</td>
<td>15,000</td>
<td>2.5</td>
<td>37,500</td>
</tr>
<tr>
<td>Plantation at the bus stops</td>
<td>no.</td>
<td>100</td>
<td>67.5</td>
<td>6,750</td>
</tr>
</tbody>
</table>

26
During the preparation of tender documents separately priced items should be defined wherever possible for the implementation of environmental safeguard measures.

Costs for training and capacity building of RTSD’s ESS and DRMU staff will be covered from a separate budget under a WB loan.

**Consultation And Disclosure**

WB’s policy on public consultation and disclosure follows specific procedures. In accordance with the provisions of OP/BP 4.01 a public consultation meeting was held in Alyat on the 23\textsuperscript{rd} of September 2005. The meeting was attended by 29 people from Alyat, and Salyan. NGOs had been informed and invited by email, but did attend. On the side of the Consultant the team leader, deputy team leader and the environmental expert were present. In addition, members of the study team of the Strategic Assessment for the overall Highway II project participated in the meeting.

At the occasion of this meeting the deputy team leader introduced the projects and the results of the EA study with the proposed mitigation and management measures. A summary of the response and the comments obtained during this meeting is provided in Appendix 2.

The draft EA report will be presented to both the Government of Azerbaijan and the Bank and shall serve as a background document for approval by the competent authority. In accordance with OP/BP 4.01, Environmental Assessment, RTSD will make the draft EA Report available in Azerbaijan in Azeri, at a public place accessible to project-affected groups and local NGOs. Moreover, RTSD will officially transmit the EA report to the Bank in English for review and clearance. Once the EA report has been locally disclosed and officially received by the Bank, the Bank will also make it available to the public through the Bank’s Infoshop.\textsuperscript{11}

APPENDIX 1: Environmental Management Plan
A) Environmental Mitigation Plan
B) Monitoring Plan
# A. Mitigation Plan (1)

<table>
<thead>
<tr>
<th>Phase</th>
<th>Issue</th>
<th>Mitigation Measure</th>
<th>Cost (in US $)</th>
<th>Institutional Responsibility</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detailed design</td>
<td>Shirvan National Park</td>
<td>Provision of 3 game underpasses (km 93.5; 97 and 100.2) incl. in- and outlet structures</td>
<td>181,600</td>
<td>Contractor RTSD Maintenance Unit</td>
<td>Design of underpasses and fence to be refined during detailed design with support of local experts and to be specified in bidding documents</td>
</tr>
<tr>
<td></td>
<td>1. Potential permanent impairment of local population of Persian Gazelle through road accidents; safety risk for road users through crossing individuals or herds of Persian Gazelle</td>
<td>Landscaping at the 3 animal underpasses</td>
<td>30,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Construction of a protective fence alongside the Park boundaries beginning at Shirvan Main Collector up to km 102 on the eastern side of the road – total length: 11.5 km; height: 2.5 - 3 m.</td>
<td>170,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plantations</td>
<td></td>
<td>Plantation of shrubs as anti-dazzle measure within the median. Use local species of shrub requiring little water and maintenance, preferably <em>Tamarix</em></td>
<td>37,500</td>
<td>Contractor RTSD Maintenance Unit</td>
<td>To be specified in bidding documents</td>
</tr>
<tr>
<td></td>
<td>1. Impact of traffic during construction</td>
<td>Plantation of trees around bus stops</td>
<td>7,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td>The contractor will provide:</td>
<td>N.A.</td>
<td>Contractor</td>
<td>Method statement to be provided during mobilisation (to be specified in the bidding documents). Traffic plans to be approved by road police. Road police should also assist in law enforcement</td>
</tr>
<tr>
<td></td>
<td>2. Endangering of traffic outside working hours</td>
<td>• information to the public about the scope and schedule of construction activities and expected disruptions and access restrictions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• measures to allow for permanent adequate traffic flow around construction areas;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• adequate signalisation, traffic safety signs, barriers and flag persons for traffic control;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• appropriate lighting and well designed safety signs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Work Safety</td>
<td></td>
<td>The Contractor will provide a statement on accident, fire and chemical spill containment / emergency procedures;</td>
<td>N.A.</td>
<td>Contractor</td>
<td></td>
</tr>
</tbody>
</table>
# A. Mitigation Plan (2)

<table>
<thead>
<tr>
<th>Phase</th>
<th>Issue</th>
<th>Mitigation Measure</th>
<th>Cost (in US $)</th>
<th>Institutional Responsibility</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>Top soil preservation</td>
<td>Top soil shall be stripped (78,540 m³) and be reused in the median (33,000 m³) and at the embankment slopes (45,000 m³). Long-term stockpiles of topsoil will immediately be protected to prevent erosion or loss of fertility.</td>
<td>513,000</td>
<td>Contractor</td>
<td>Contractor</td>
</tr>
</tbody>
</table>
|             | Contractor's yard                                          | The contractor shall detail proposed measures to avoid or reduce adverse environmental impacts resulting from installation and operation of his work camp. As a minimum, the following measures will be taken:  
• The contractor shall submit a description of fuel storage and its location, and of the filling station and car washing site to the local executive and sanitary authorities, including a statement on their location, further than 500 m from water sources and irrigation systems;  
• Provision of secure, impermeable and bounded compounds to store chemicals and oil distant from any surface waters;  
• Establishment of a waste management plan covering the following: regular waste collection and disposal from worksite / contractor's yard and worker's camp (may be temporarily integrated into the existing waste collection systems and disposal facilities of Alyat, Salyan or other location); separate collection of toxic and harmful waste as well as used tires to be handled in co-operation with an approved, authorized partner, according to the relevant regulatory provisions and disposed of at designated sites according to MENR requirements | N.A.           | Contractor                  | To be specified and made a separate, priced item in the bidding documents | Contractor to submit a separate plan describing the location and layout of his work camp and providing details on the management of waste, the storage and handling of fuel, diesel, oil and other toxic / harmful substances. The contractor shall obtain approval of this plan from ESS  
The waste management plan shall include an estimate of the types and quantities of waste matter, other residual materials, and the rate at which these will be produced. The methods by which the quantities of residuals and wastes were estimated should also be indicated. The plan should also include appropriate arrangements for the local storage and transport of this waste (as appropriate). |
### A. Mitigation Plan (3)

<table>
<thead>
<tr>
<th>Phase</th>
<th>Issue</th>
<th>Mitigation Measure</th>
<th>Cost in US $</th>
<th>Institutional Responsibility</th>
<th>Comments</th>
</tr>
</thead>
</table>
| d) cont. Construction | Equipment servicing and fuelling | • Fuelling and servicing of equipment and machinery will be confined to designated areas designed to contain spilled lubricants and fuel;  
• Storage, handling and disposal of waste oil shall be managed and disposed of to approved sites according to MENR requirements;  
• Washing of vehicles or any equipment in the Collector or temporary streams or ponds will be strictly forbidden. To this regard the contractor will inform his workforce accordingly. | N.A.         | Contractor                  | Contractor to provide a separate method statement and obtain approval from ESS during mobilisation |
| e)       | Worker’s safety and health  
Poor work site conditions may deteriorate worker’s health | • Apply to MoH’s Central Disinfection Centre and the District Disinfection Centre to obtain approval on the general living conditions and sanitary provisions in the worker’s camp;  
• Provide adequate health care facilities within the construction sites, including first aid equipment and facilities;  
• Provide workers with safety instructions and appropriate personal protective gear such as protective clothing, safety boots, helmets, gloves, goggles, ear protection etc;  
• Train all construction workers in basic sanitation and health care issues, general health and safety matters and on the specific hazards of their work;  
• Assure good drainage at all sites within the construction camp to avoid stagnant water bodies which may become breeding sites for vectors of waterborne diseases;  
• Regular clearing of septic tanks from worker’s camp and other mobile toilets to prevent outbreak of diseases;  
• Provide clean potable water for all workers in compliance with the relevant national standards on drinking water quality. | N.A.         | Contractor                  | The Contractor should appoint an environment, health and safety manager in the Construction Super-vision Team (to be specified in the bidding documents)  
Personal working gear to be specified and made a separate, priced item in the bidding documents  
Water supply is a problem in the project area. Therefore potable water supply for workforce should be made a separately priced item in the bidding documents |
### A. Mitigation Plan (4)

<table>
<thead>
<tr>
<th>Phase</th>
<th>Issue</th>
<th>Mitigation Measure</th>
<th>Cost (in US $)</th>
<th>Institutional Responsibility</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cont. Construction</td>
<td>Worker’s safety and health Low Level awareness on HIV/AIDS and STD: Spread of HIV/AIDS and STD to the local community</td>
<td>All construction workers will be adequately informed about HIV/AIDS and STD and on how to avoid infection and transmission; Group consultation may be also done to create awareness among the community about these diseases.</td>
<td>3,000</td>
<td>Contractor</td>
<td>The contractor may subcontract or cooperate with the AIDS Centre in Baku to obtain practical advice and support.</td>
</tr>
<tr>
<td>Cont. Construction</td>
<td>Material supply: Asphalt Plant Dust, fumes, worker’s health &amp; safety, ecosystem disturbance;</td>
<td>The Contractor shall obtain official approval or valid operating licence for the asphalt plant. He shall submit a layout plan of the site of the mixing plant and a method statement on handling of bitumen spills prior to the commencement of works. At the site the Contractor shall take appropriate provisions to assure that bitumen may not enter into dry or running stream beds or channels nor may it be disposed of in ditches or any waste disposal site. The bitumen storage and mixing area must be effectively protected against spill. Contaminated soil shall be handled according to MENR requirements or other acceptable standards. As a minimum, these areas must be contained as to allow immediate collection and clean up. Any petroleum products shall also be carefully managed to avoid spills and the contamination of the local groundwater table.</td>
<td>N.A.</td>
<td>Contractor</td>
<td>to be specified in bidding-documents – Conditions for selection of sub-contractors for material supply</td>
</tr>
<tr>
<td>Cont. Construction</td>
<td>Sand &amp; Gravel Borrow Pit Disturbance of river bed, water quality, ecosystem disturbance.</td>
<td>The Contractor shall obtain official approval or valid operating licence and set up a plan of each borrow site he intends to use, indicating the location and planned rehabilitation upon completion of works.</td>
<td>N.A.</td>
<td>Sand or gravel contractor</td>
<td></td>
</tr>
</tbody>
</table>
## A. Mitigation Plan (5)

<table>
<thead>
<tr>
<th>Phase</th>
<th>Issue</th>
<th>Mitigation Measure</th>
<th>Cost</th>
<th>Institutional Responsibility</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>cont.</td>
<td>Material transport</td>
<td></td>
<td>Install</td>
<td>Operate</td>
<td>g)</td>
</tr>
<tr>
<td>Construction</td>
<td>Asphalt (Dust, fumes)</td>
<td>• Cover truck load</td>
<td>minimal</td>
<td>minimal</td>
<td>truck operator</td>
</tr>
<tr>
<td></td>
<td>Stone (Dust)</td>
<td>• Wet or cover truck load</td>
<td>minimal</td>
<td>minimal</td>
<td>truck operator</td>
</tr>
<tr>
<td></td>
<td>Sand &amp; Gravel (Dust)</td>
<td>• Wet or cover truck load</td>
<td>minimal</td>
<td>minimal</td>
<td>truck operator</td>
</tr>
<tr>
<td>h)</td>
<td>Nuisance for the population in the neighborhood of borrow sites through dust and noise</td>
<td>Establish a dust control program: In the vicinity of settlements or where the local population might be affected through material transport the contractor will be required to regularly water haul routes. This will also apply to temporary access routes to aggregate sites. For these areas the contractor will prepare a spraying schedule which is the basis of the dust control program. Trucks shall be covered to minimize dust and material spillage.</td>
<td>minimal</td>
<td>minimal</td>
<td>Contractor</td>
</tr>
<tr>
<td>i)</td>
<td>Impediment of surface water quality</td>
<td>In the vicinity of settlements material transport will be restricted to between 0700 to 2100 hours within a 500 m distance of the adjoining settlements; The contractor will take all necessary measures to prevent earthworks and stone works related to road construction from impeding the flow of rivers / streams and canals or existing irrigation and drainage systems; Disposal of wastes, materials, as well as filling and parking of vehicles is restricted within 100 m of water drainage zones; Washing of vehicles or any equipment in the Collector or any other temporary ponds will be strictly forbidden. The contractor shall instruct his workforce accordingly.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>minimal</td>
<td>minimal</td>
<td>Contractor</td>
</tr>
</tbody>
</table>
## A. Mitigation Plan (6)

<table>
<thead>
<tr>
<th>Phase</th>
<th>Issue</th>
<th>Mitigation Measure</th>
<th>Cost</th>
<th>Institutional Responsibility</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>l)</td>
<td>Construction</td>
<td>Air pollution from improper maintenance of equipment</td>
<td>Install: minimal, Operate: minimal</td>
<td>Contractor</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maintain construction equipment to good standard; improper functioning machinery that causes excessive pollution will be banned from the construction sites.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>m)</td>
<td>Archaeological chance finds</td>
<td>In the event of the unexpected discovery of archaeological objects the Contractor should immediately notify local and archaeological authorities and follow their directions. Construction works would be stopped and the appropriate local executive authority would be immediately informed. Works will resume only after appropriate measures have been taken as requested by the appropriate authority, and confirmation has been received from them that works may continue.</td>
<td>Install: minimal, Operate: minimal</td>
<td>Contractor</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Requirements concerning measures in case of chance finds shall also be included in the bidding documents for civil works,</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**List of method statements / plans to be required from the Contractor for approval through ESS (more details see EA Report):**

12. A method statement on how conditions of safety on site and for traffic control and safety throughout all stages of construction shall be maintained; A statement on accident, fire and chemical spill containment / emergency procedures;

13. A proposal on the siting and organisation of the contractor’s yard / work camp;

14. A waste management plan for the operation of the contractor’s yard and worker’s camp The plan should also include appropriate arrangements for the local storage and transport of this waste (as appropriate).

15. A layout plan of the site of the mixing plant and a method statement on the technology for bitumen storage and transport to the mixing plant and for the handling of bitumen spills;

16. A layout plan of the borrow pits for gravel and sand extraction and a method statement on the proposed work technology (crushing technology, measures for the minimization of waste) and material transport;

17. A layout plan of the borrow pit for fill material extraction, transportation method / route, rehabilitation of the borrow pit and methods proposed for the minimization of adverse environmental impact;

18. A method statement for the organization and execution of bridge construction works (Shirvan Main Collector);

19. Implementation of other technological processes according to standard requirements for the minimization of wastes and discharges;

20. A method statement on the management of dust and noise from material transport including indications on the proposed haul routes and the distance of these haul routes to the nearest houses / settlements;
21. A method statement on the proposed methodology for bridge construction over the Shirvan Main Collector and the proposed measures for the avoidance of surface water pollution.
## B. Monitoring Plan (1)

<table>
<thead>
<tr>
<th>Phase</th>
<th>What parameter is to be monitored?</th>
<th>Where is the parameter to be monitored</th>
<th>How is the parameter to be monitored?</th>
<th>When is the parameter to be monitored?</th>
<th>Cost</th>
<th>Institutional responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Install</td>
<td>operate</td>
</tr>
<tr>
<td><strong>CONSTRUCTION PHASE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N.A.</td>
<td>minimal</td>
</tr>
<tr>
<td>b) Traffic safety</td>
<td>Existence of traffic management plan; traffic patterns</td>
<td>At and near job site</td>
<td>Inspection; observation; comparison with Contractor’s method statement</td>
<td>Before works start and once a week at peak and non-peak periods; during construction period once per week in the evening / in the dark</td>
<td>N.A.</td>
<td>minimal</td>
</tr>
<tr>
<td>Safety during construction</td>
<td>Visibility and appropriateness</td>
<td>At and near job site</td>
<td>Inspection; observation</td>
<td></td>
<td>N.A.</td>
<td>minimal</td>
</tr>
<tr>
<td>Safety outside working hours (night)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N.A.</td>
<td>minimal</td>
</tr>
<tr>
<td><strong>Top soil preservation</strong></td>
<td>Stockpiling and means of protection</td>
<td>Job site</td>
<td>Inspections; observation</td>
<td>Upon preparation of the construction site, after stockpiling and after completion of works on shoulders</td>
<td>N.A.</td>
<td>minimal</td>
</tr>
<tr>
<td><strong>c) Contractor’s yard</strong></td>
<td>Contractor’s yard</td>
<td>Inspections; observations</td>
<td>Unannounced inspections during construction</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td><strong>Equipment servicing and fuelling</strong></td>
<td>Contractor’s yard</td>
<td>Inspections; observations</td>
<td>Unannounced inspections during construction</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
</tbody>
</table>
### B. Monitoring Plan (2)

<table>
<thead>
<tr>
<th>Phase</th>
<th>What parameter is to be monitored?</th>
<th>Where is the parameter to be monitored?</th>
<th>How is the parameter to be monitored?</th>
<th>When is the parameter to be monitored? Frequency</th>
<th>Cost</th>
<th>Institutional responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Worker’s safety and health</strong></td>
<td>Possession of MoH’s official approval for worker’s camp; Availability of appropriate personal protective equipment; organization of traffic on the construction site</td>
<td>Job site and worker’s camp</td>
<td>Inspection; interviews; comparisons with the Contractor’s method statement</td>
<td>Unannounced inspections during construction and upon complaint</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td><strong>Worker’s education on AIDS and STD</strong></td>
<td>Has relevant education been provided?</td>
<td>Worker’s camp</td>
<td>Interviews</td>
<td>After beginning of works and at appropriate intervals throughout construction</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td><strong>Material supply</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asphalt plant</td>
<td>possession of official approval or valid operation license</td>
<td>Asphalt plant</td>
<td>Inspection</td>
<td>Before work begins</td>
<td>N.A.</td>
<td>plant operator</td>
</tr>
<tr>
<td>Stone quarry</td>
<td>possession of official approval or valid operation license</td>
<td>Stone quarry</td>
<td>Inspection</td>
<td>Before work begins</td>
<td>N.A.</td>
<td>quarry operator</td>
</tr>
<tr>
<td>Sand and gravel borrow pit</td>
<td>possession of official approval or valid operation license</td>
<td>Sand and gravel borrow pit</td>
<td>Inspection</td>
<td>Before work begins</td>
<td>N.A.</td>
<td>borrow pit operator</td>
</tr>
</tbody>
</table>

**Note:** N.A. = Not applicable

**Institutional responsibility:** Supervision Contractor
## B. Monitoring Plan (3)

<table>
<thead>
<tr>
<th>Phase</th>
<th>What parameter is to be monitored?</th>
<th>Where is the parameter to be monitored?</th>
<th>How is the parameter to be monitored?</th>
<th>When is the parameter to be monitored? Frequency</th>
<th>Cost</th>
<th>Institutional responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material transport asphalt</td>
<td>Are the truck loads covered or wetted? Compliance with the Contractor’s method statement (restricted working hours; haul routes) dust suppression methods where required</td>
<td>Job site / haul routes</td>
<td>Supervision</td>
<td>unannounced inspections during work</td>
<td>N.A.</td>
<td>minimal</td>
</tr>
<tr>
<td>Stone</td>
<td></td>
<td>Job site / haul routes</td>
<td>Supervision spot checks</td>
<td>unannounced inspections during work</td>
<td>N.A.</td>
<td>minimal</td>
</tr>
<tr>
<td>Sand and gravel</td>
<td></td>
<td>Job site / haul routes</td>
<td>Supervision</td>
<td>unannounced inspections during work</td>
<td>N.A.</td>
<td>minimal</td>
</tr>
<tr>
<td>Surface water protection</td>
<td>Contractor’s compliance with his approved method statement</td>
<td>Bridge construction site at Shirvan Main Collector</td>
<td>Inspection</td>
<td>unannounced inspections during bridge works</td>
<td>N.A.</td>
<td>minimal</td>
</tr>
<tr>
<td>Air pollution from improper maintenance of equipment</td>
<td>exhaust fumes, dust at site visual inspection unannounced inspections during works</td>
<td>N.A.</td>
<td>minimal</td>
<td>N.A.</td>
<td>Supervision contractor</td>
<td></td>
</tr>
<tr>
<td>Asphalt plant</td>
<td>exhaust fumes, dust at site visual inspection unannounced inspections during works</td>
<td>N.A.</td>
<td>minimal</td>
<td>N.A.</td>
<td>Supervision contractor</td>
<td></td>
</tr>
</tbody>
</table>

### OPERATIONAL PHASE

The Environmental Monitoring Plan prepared and implemented during the construction phase should be expanded based on that experience. The monitoring plan for the operational phase should also include monitoring post-construction during the first year of operation so that action may be taken if any detrimental effects occur.
APPENDIX 2: Records of Meetings
23.09.05 Public Consultation Meeting in Alyat
held at the office of the Local Executive Power

The public consultation meeting held in Alyat was attended by officials from Alyat and Salyan (see list of participants). On the side of the consultants the team leader, deputy team leader and environmental expert were present. Members of the team that carried out the Strategic Environmental Assessment of the Highway II Project were also present. NGOs and representatives from Xisirli and Kürsengi had also been invited, but did not turn up.

After an introductory speech held by representatives from the local executive power and the distribution of a written project information the deputy team leader introduced the overall project and explained the purpose of the meeting and the results of the EA study.

During the subsequent discussion the major issue of concern was the question whether the project would also comprise the rehabilitation of some secondary access roads of the M 3 or animal crossings on the railway. The local team leader informed the audience that this is not considered in the frame of the present project. One participant suggested that if the construction materials could be provided by the project they would be ready to build local access roads by themselves. The deputy team leader explained why the rehabilitation of these roads would have to be provided by the Municipalities.

Another question was about employment opportunities for local workforce during project implementation and the consultants explained the procedure.

Regarding the Shirvan National Park it was confirmed that underpasses need to be built allowing for the free and safe movement of Persian Gazelles. One participant voiced his doubts on whether the animals would ultimately use these underpasses. It would be important to design these underpasses in such a way that they would be as attractive as possible to the animals.

A representative from the District Road Maintenance Unit in Salyan informed the team leader about very unfavourable ground conditions between km 99 and km102. The deputy team leader replied that the design team is aware of this issue and would be considered in more detail during the detailed phase.
## List of Participants: Public Consultation Meeting in Alyat, September 23, 2005

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Position</th>
<th>Contact number</th>
</tr>
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<td>Habiba Mansurova</td>
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<td>Hidayet Ibrahimov</td>
<td>Engineer of RMU No.2 of Qobustan village</td>
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<td>Vuqar Huseynov</td>
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<td>Feyzulla Bedirov</td>
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<td>Aladdin Sadiqov</td>
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<td>Fakhraddin Akhundov</td>
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<td>Ahmad Karimov</td>
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<td>22</td>
<td>Miraga Qayibov</td>
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<td>Tahir Gulaliev</td>
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<td>24</td>
<td>Mahamad Mammadov</td>
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<td>25</td>
<td>Seyfali Abdullayev</td>
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<td>26</td>
<td>Qadir Mikayilov</td>
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<td>Kamil Jalabi</td>
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<td>Agacan Babayev</td>
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<td>Vakil Ismayilov</td>
<td>Resident of Alyat settlement</td>
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**Consultants**

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<tr>
<th>Name</th>
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<tr>
<td>Carsten Griese</td>
<td>RRI Team Leader</td>
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<tr>
<td>Sadig Mutallimov</td>
<td>RRI Team Leader Assistant</td>
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<td>Melanie Poerschmann</td>
<td>RRI Environmental expert</td>
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<tr>
<td>Edda Ivan-Smith</td>
<td>Scott Wilson, Social Expert Strategic</td>
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<td>Environmental Assessment ‘Highway II</td>
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<td>Project’</td>
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<tr>
<td>Nargiz Asadova</td>
<td>Scott Wilson, local Social Expert Strategic Environmental Assessment ‘Highway II Project’</td>
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</table>
02.09.05 Meeting with Mr. Fahraddin ACHUNDOV
Director of Shirvan National Park

Mr. Achundov was pleased to be informed about what exactly is being planned regarding the upgrading of the M3.

Regarding the Shirvan National Park, the local population of the Persian Gazelle (Gazella sunbgutturosa) will need better protection when the M3 is upgraded.

Currently the population is increasing in numbers and have come up to some 5,000 to 5,500 heads due to improved and more effective protection from poachers and the elimination of sheep and goat from the Park. This could be achieved by the construction of a deep ditch throughout the boundaries of the Park and in parallel of the M3 and through the provision of a fence alongside parts of the Park boundaries. As a result of increasing numbers of animals there is now a tendency that they leave the Park and cross the road at night which represents a hazard for road users but also puts the animals at risk. Once the gazelles leave the park they are under immediate threat from the poachers of the surrounding villages.

Upgrading of the M3 will increase the hazard of accidents caused by crossing animals. According to Mr. Achundov the most practical and effective impact mitigation measure would be to provide a fence beginning from the Shirvan main collector, which represents the northern border of the park. The fence that presently exists between km 100 (beginning of Kürsengi) and the end of the project section (km 102) is considered as inadequate for the prevention of these accidents: with a height of only 1.30 m from the ground it does provide an effective protection against goats and sheep, but does not prevent the gazelles from leaving the territory of the Park.

It is thus suggested that a new fence be provided under the project alongside the borders of the Shirvan National Park. This fence shall be of sufficient height to effectively prevent the animals from crossing. Moreover, the fence should be put in place before the beginning of construction works so as to prevent workforce from entering and poaching. Details on the optimal height and location should be clarified through consultation with an ungulate specialist from the Dept. of Zoology at the Azerbaijan Institute of Natural Sciences. Moreover, Mr. Achundov recommends to discuss the issue with the competent Department in the Ministry of Environment.

08.09.05 Meeting with Mr. GULIYEV, Sujeddin
Azerbaijan National Academy of Sciences, Institute of Zoology

Mr. GULLIYEV works as scientific advisor on a BP funded project for the protection and reintroduction of the Persian Gazelle to their former areas of distribution in other parts of the country. Mr. Guliyev is the Head of the Dept. of Terrestrial Vertebrates and a recognized expert for the biology and ecology of Persian Gazelles in Azerbaijan.

The Persian Gazelles at Shirvan NP represent a single, genetically isolated population. However, the species is not strictly territorial and permanently expanding to new habitat. One direction to which Persian Gazelles from the Shirvan National Park are presently migrating is the Gobustan area. To support the protection of Persian Gazelles and their survival outside the Park educational programs are also currently conducted.

From a scientific and biological point of view fencing of the Park boundaries is in fact recommendable to mitigate the negative effects of the existing M3 on the local population. To make this measure effective, animal passages have to be provided at such sites that are traditional game paths.
At the occasion of a trip to the project area (15.09.05) the Park administration confirmed the following existing crossing points of Persian Gazelles: km 92; km 93.5; km 94; km 94.5, km 96 and km 97.

Mr Guliyev also informed the consultant about a BP-funded project which aims at the reintroduction of Persian Gazelles to their previous natural habitats. The provision of underpasses for the safe crossing of gazelles would be important elements in the creation of ‘green corridors’ linking the Shirvan National Park to the other natural habitats.
22 km Section of the Alyat – Astara Highway - Environmental Assessment

APPENDIX 3: Terms of Reference