

# Initial Environmental Examination

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September 2013

AZE: Road Network Development Program–  
Tranche 4

(Four Bridges Improvement Project  
Ganja Region, Agstafa District  
Roads: R 24 and Y-05-08)

## CURRENCY EQUIVALENTS

(as of 1 April 2013)

Currency Unit	=	Azeri Manat
AZN1.00	=	US\$ 1.16
US\$1.00	=	AZN0.86

## ABBREVIATIONS

ADB	-	Asian Development Bank
ARS	-	AzerRoadService, AzerYolServis
WSS	-	Water Supply & Sanitation
MFF	-	Mult-tranche Financing Facility
AzerSu	-	AZERSU Joint Stock Company
SAWMA	-	State Amelioration and Water Management Agency
EA	-	Executing Agency
EAC	-	Expert Appraisal Committee
EARF	-	Environmental Assessment & Review Framework
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
PMF	-	Program Management Facility
RA	-	The Republic of Azerbaijan
MENR	-	Ministry of Environment and Natural Resources
MSL	-	Mean Sea Level
WWTP	-	Wastewater Treatment Plant
IA	-	Implementing Agency
IEE	-	Initial Environmental Examination
SAIC	-	State Amelioration and Irrigation Committee
RF	-	Resettlement Framework
PVC	-	Polyvinyl Chloride
HDPE	-	High Density Poly Ethylene
EMP	-	Environmental Management Plan
JSC	-	Joint Stock Company
M&E	-	Monitoring and Evaluation
SES	-	Sanitary Epidemiology Service, Ministry of Health

## NOTES

- (i) The fiscal year (FY) of the Government of Azerbaijan ends on 31 December. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2008 ends on 31 December 2008.
- (ii) In this report, "\$" refers to US dollars.

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## EXECUTIVE SUMMARY

1. The Four Bridges Improvement Project in Ganja Region, Agstafa District for which AzerRoadService requested financing from the ADB Framework Financing Agreement (FFA) for Azerbaijan Road Network Development Program dated 08 August 2007 is intended to optimize social and economic development in selected rural areas through improved transport facilities. This Investment Program is embedded in Tranche-4 of the Multi-tranche Financing Facility (MFF), and will cover: Rehabilitation/Reconstruction of 4 Bridges on the R 24, Agstafa – Poylu – Sadiqli. Georgian Border and Y-05-08, Poylu – Duzqislaq – Gazakh Roads. The AzerYolServis (AzerRoadService) Joint Stock Company is the Executing Agency. PIU, created at AzerRoadService, is responsible for project implementation, and is supported by international and national consultants. At the field level, a Project Implementation Review Committee will review progress and ensure timely resolution of operational issues.
2. ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for Environmental Assessment are described in ADB's Safeguard Policy Statement (2009). This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, loans involving financial intermediaries, and private sector loans. Accordingly, this Initial Environmental Examination (IEE) Report has been prepared for the 4 Bridges Improvement Project in Ganja Region, Agstafa District to be implemented in Tranche IV. Components of this subproject are: rehabilitation of 4 bridges as listed in the following table

Bridge	01	02	03	04
Road	R-24 Agstafa-Poylu- Sadiqli	R-24 Poylu-Sadiqli	R-24 Poylu-Sadiqli- Gurcustan	Y-05-08 Poylu-Duzqislaq- Qazax
km	2.0	17.0	29.5	0.1
Existing span arrangement (m)	2 x 14, 1 x 22	8 x 21.5	3 x 18	4 x 18
Existing carriageway arrangement (m)	1.4+7.0+1.4	0.2+4.6+0.2	1.2+8.0+1.2	1.4+8.0+1.4
Obstacle crossed	Railway	Kura River	Aji Dara River	Agstafa River
Location: Decimal Degrees (WGS84)	41.1275, 45.4417	41.2420, 45.4396	41.3021, 45.3509	41.2262, 45.4397

and rehabilitation of some 40 Km of rural roads in this area. The Project is currently in bid preparation stage. Construction is likely to start in January 2014 and will be completed in 30 months.

3. The bridge reconstruction sites are located in existing roads right of way and government-owned lands and are clear of human habitation. There are no protected areas, wetlands, mangroves, or estuaries. Due to careful location of sites, there is no need for land acquisition and relocation of people. Trees, vegetation (mostly shrubs and grasses), and animals in the subproject site are those commonly found in built-up areas.
4. Regardless of these various actions in locating and designing infrastructure during the IEE process, there will still be impacts on the environment when the infrastructure is built and when it is operating. This is mainly because construction sites except of Bridge No. 3 are located in or close to inhabited settlements where there are densely populated areas.

Because of these factors the considerable impacts are on the physical and human environment.

5. During the construction phase, impacts mainly arise from the need to carry construction materials to the construction sites, to excavate material for concrete and asphalt production at existing quarries and the construction activities itself (mainly noise and dust). These are common impacts of construction in inhabited areas, and there are well developed methods for their mitigation. These include: (i) careful control of all construction traffic; (ii) covering soil and sand during transportation and when stored on site; (iii) planning work to minimize disruption of traffic and communities; and (iv) control of noise and dust emission.
6. Once the bridges and rehabilitated rural roads are open for traffic the improved transport infrastructure will even produce less impacts as petrol consumption and noise emission will decrease and road safety improve.
7. The major impacts of the Four Bridges Improvement Projects will be beneficial to the citizens of the citizens along R 24 and Y-05-08 Roads as this will provide constant supply of transport both, for passengers and commodities and improve access to the regional markets in Gazakh and Ganja as well to Baku. This will improve the quality of life of people as well as benefiting both individual and public development. This should lead to economic gains as people will be away from work less and will spend less time on transport, so their incomes should increase.
8. General principles on the Environmental Management Plan (EMP) is proposed as part of this IEE which includes (i) mitigation measures for significant environmental impacts during implementation, (ii) environmental monitoring program, and the responsible entities for mitigation, monitoring, and reporting; (iii) public consultation and information disclosure; and (iv) grievance redress mechanism. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. A number of impacts and their significance have already been reduced by amending the designs. Mitigation will be assured by a program of environmental monitoring to be conducted during construction stages. The environmental monitoring program will ensure that all measures are implemented, and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries. Any requirements for remedial action will be reported to the ADB. In a separate document specific EMP's have been presented for each bridge construction sites.
9. The stakeholders were involved in developing the IEE through discussions on site and public consultation after which views expressed were incorporated into the IEE and the planning and development of the project. The IEE will be made available at public locations and will be disclosed to a wider audience via the ADB website. The consultation process will be continued and expanded during project implementation to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation.
10. Therefore, the components proposed under this bridge and rural roads rehabilitation project in Ganja Region, Agstafa District are unlikely to cause significant adverse impacts. The potential impacts that are associated with design, construction, and operation can be



mitigated to standard levels without much difficulty through proper engineering design and the incorporation/application of recommended mitigation measures and procedures. Based on the findings of the IEE, the classification of the Project as Category “B” is confirmed, and no further study or detailed EIA is required to comply with ADB SPS (2009). As per the Law of Environmental Protection 1999, an EIA study and approval from MNER is necessary for this subproject. AzerRoadService is in the process of obtaining these mandatory approvals/permissions from MNER.

## A. INTRODUCTION

### 1.0 Purpose and Context of the Report

1. The Government of the Republic of Azerbaijan (the Government) has requested the Asian Development Bank (ADB) to provide financial assistance from the Road Network Development Program (the Program) under the proposed Multi-tranche Financing Facility (MFF). Part of the funding under the MFF shall be used for the rehabilitation and reconstruction of bridges on the Azerbaijan road network. The Azeryolservis ASC has identified four bridges in need of urgent rehabilitation or replacement.
2. The Azeryolservis ASC under the Ministry of Transport shall be the Implementing Agency (IA) for this project. The IA has engaged Kocks Consult GmbH, Germany to prepare a feasibility study including conceptual bridge design, an environmental impact assessment, and a social and poverty study, necessary to comply with ADB guidelines and standards for project preparation. The bridges are located along the roads R 24, Agstafa – Poylu – Sadiqli and Y-05-08, Poylu-Düzqışlaq-Qazaxroad, which both will be updated to category II in the future which has to be reflected in the bridge design.

#### 1.1 Purpose

3. With the Contract Agreement for Consultancy Services dated 08. August 2013, the Azeryolservis appointed Kocks Consult GmbH as Consultant for the Preparation of the Feasibility Study for 4 Bridges in the Ganja Region. In addition, and Initial Environmental Examination (IEE) study is required for this project following the screening process undertaken by the ADB. The assignment is to provide a feasibility study including conceptual bridge design, an environmental impact assessment, and a social and poverty study in compliance with ADB guidelines and standards.

#### 1.2 Nature, Size and Location of the Project

4. The Project includes the rehabilitation and improvement of the approaches and the rehabilitation of some 40 km of local roads without any changes in the alignment. All road sections on which the bridges are located will be designed for Category III and thus bridges have to be designed as Category II, as per the following details:
  - carriageway width: 7.50 m (2 x 3.75 m);
  - width of shoulder: 3.00 m (2 x 1.50 m);
  - single side pedestrian walkway, 1.50 m wide plus safety strip carriageway side, 0.44 m wide and railing, 0.20 m wide;
  - single side safety strip, 1.00 m wide;
5. The Contractor is expected to prepare an acceptable detailed design according to technical and environmental standards. The technical standards include Azeri standards, GHOST, SNIP, and AASHTO. The consultant will ensure that the design and built contract include all necessary measures to minimize and mitigate environmental and social impacts, and improve road safety. The consultant will assist the PIU in obtaining all obligatory technical and environmental approvals required prior to construction.

- The four (4) bridges are all located in Gazakh Region, three (3) of them along the (Gazakh) - Agstafa – Poylu – Sadiqli – Georgian Border (R 24) and one bridge on the Gazakh – Poylu Road (Y-05-08). Figure 1 below indicates the locations.



**Figure 1: Location Map of the 4 Bridges**

## **2.0 Extent of IEE Study**

- The 4 Bridge Improvement Project in Ganja Region, Agstafa District is classified under the ADB SPS 2009 as environment category B, requiring IEE study. This is the IEE Report of the subproject. The purpose of this IEE is to assess potential environmental, health, safety and social impacts of the proposed subproject. No significant adverse environmental impacts have been noted in this subproject assessment.
- The IEE was prepared during the Investment Program preparation in 2013 and approval by ADB is expected. The Project is currently in bid preparation stage.
- The IEE study is conducted based on secondary information, primary data from various sources and field observations. During the site visit the specialists had discussions with

town members and local executive powers for their feedback on the proposed project. The results of the social survey with town members as well as an evaluation of the institutional framework have been incorporated into this assessment.

## **PROJECT NEED, ALTERNATIVES AND REQUIRED APPROVALS**

### **1.0 Type of Project**

10. The project will entail reconstruction of the three (3) selected bridges along R-24 road and one (1) bridge along Y-05-08, all within Qazakh District. The reconstruction of these bridges is recommended and involuntary resettlement for any of the options proposed. In some cases the temporary usage of privately owned land during the construction time may be necessary for use of campsites or construction area. But this can be further negotiated by the contractor of the project with the. Safety, social and environmental impacts will need to be mitigated by the winning construction contractor according to detailed mitigation measures described in the EMP.
11. The bridge construction for Bridges Nos. 1, 3 and 4 will entail demolition of the existing bridge structure and establishing bypass or detour road for normal traffic flow. For Bridge No. 2 the new bridge structure will be built alongside the existing one, thus retaining the old structure to prevent disruptions to traffic flow. All of these bridges will be new structures; however a “due diligent study” was undertaken to avoid land acquisition and involuntary resettlement.

### **2.0 Need for the Project**

12. Roads and bridges are considered the lifeline of Azerbaijan’s transport-based economy and because of this rationale strong efforts have been embarked toward the development of the Primary Road Network of Azerbaijan with the aid of International Financing Institutions, particularly ADB. A number of Primary roads with their bridges have been reconstructed and rehabilitated under such financing arrangements.
13. In the recent months, the secondary roads, bridges and local networks are more and more entering the financing focus. Because this, important feeders to the primary networks and international transport corridors are often scarcely maintained and in an overall bad condition thereby limiting the access of local industry and enterprises to important markets. To improve on this situation, the Government of Azerbaijan has requested ADB to extend financial assistance from the Road Network Development Program for the rehabilitation and reconstruction of four bridges on the Azerbaijan road network in the Northwest of the country (Gazhak Region).
14. The Implementation of the project will therefore improve access to the primary road network (M2), establish an alternative to the M2 to the Georgian Border and also improve the connection of the regions to Ganja, Azerbaijan’s second largest city and an important industrial, commercial and administrative centre.

### **3.0 Alternatives Considered**

15. The reconstruction works for the bridges was conceptualized by considering a number of alternatives arising from location, type of construction, minimal impacts and each of construction. In order to minimize any areal and physical impacts, it was decided that the bridges should be constructed practically at the same location or close to it to avoid any land acquisition and involuntary resettlement. The following deliberations on the

alternatives were undertaken for each of the bridges:

- **Bridge No. 1, R-24 Agstafa-Poylu-Sadiqli Road, km 2+000.** The main consideration in this bridge is to construct it at exactly the same spot as the existing one. The substructure will all be new components which will entail excavation for the new bridge abutment and foundation. The superstructure will be precast single-span girders which be resting on abutments for safety and cost optimization. To minimize social impacts, the diversion road will utilize part of village local road and cross the railway to connect to the village road at the opposite side of the railway. Major trees will be avoided by the location of the access road. Maintenance of the detour road shall be part of the scope of the contractor.
- **Bridge No. 2, R-24 Poylu-Sadiqli Road, km 17+000.** It was established the existing one-way steel bridge is the only crossing over the Kura River in the vicinity. Hence, the alternative of removing the bridge and replacing it at the same location was ruled out. One option considered was to construct the new bridge downstream of the existing bridge, but due to difficulty in attaining a good geometry for the approach roads this was not adopted. The alternative of situating the new bridge upstream of the existing bridge yielded better bridge road approach geometry. However, a number of trees would be affected. Since these trees are not protected species, replacement and/or replanting them can be undertaken. This will form part of the scope of the contractor.
- **Bridge No. 3, R-24 Poylu-Sadiqli-Gurcistan Road, km 29+500.** Bridge No. 3 can be constructed at the same location as the existing bridge. The option being considered here is the detour access road. At the upstream area, there's minimal vegetation; however a gas pumping facility is located around 150m southwest of the existing bridge. Since this is a sensitive facility, it was opted to situate the detour downstream. A number of young Tamerix trees may be affected; however these are not protected species and can be replaced or replanted as part of the scope of the contractor.
- **Bridge No. 4, Y-05-08 Poylu-Duzqislaq-Qazax Road, km 0+100.** This bridge can be demolished and reconstructed at the same spot. The right-of-way for this bridge is clearly defined and no physical or natural obstruction exists. Normal construction nuisances and disturbance may occur but will be limited in the construction area. Traffic will not be disrupted since an alternate bridge is being used by vehicles north of this bridge.

#### 4.0 Required Approvals

##### 4.1 Required ADB Environmental Approval

16. ADB requires the consideration of environmental issues in all aspects of its operations. Superseding the previous environment and social safeguard policies, ADB's Safeguard Policy Statement, 2009 (SPS, 2009) sets out the policy objectives, scope and triggers, and principles for three key safeguard areas: (i) environmental safeguards, (ii) involuntary resettlement safeguards, and (iii) Indigenous Peoples safeguards. ADB adopts a set of specific safeguard requirements that borrowers/clients are required to meet in addressing environmental and social impacts and risks. Borrowers/clients comply with these requirements during project preparation and

implementation. The environmental safeguard requirements are indicated in Appendix 1 of SPS 2009 (Safeguard Requirements 1: Environment). This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, and loans involving financial intermediaries, and private sector loans.

17. **Screening and Categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project, the sensitivity, scale, nature and magnitude of its potential impacts, and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impact are assigned to one of the following four categories:
  - (i) **Category A.** Projects could have significant adverse environmental impacts. An environmental impact assessment (EIA) is required to address significant impacts.
  - (ii) **Category B.** Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
  - (iii) **Category C.** Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
  - (iv) **Category FI.** Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all projects will result in insignificant impacts.
18. **Environmental Management Plan:** An environmental management plan (EMP) which addresses the potential impacts and risks identified by the environmental assessment shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the project's impact and risks.
19. **Public Disclosure:** ADB will post the following safeguard documents on its website so affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation:
  - (i) For environmental category A projects, draft EIA report at least 120 days before Board consideration;
  - (ii) Final or updated EIA and/or IEE upon receipt; and
  - (iii) Environmental Monitoring Reports submitted by Implementing/Executing Agencies during project implementation upon receipt
20. ADB also requires public consultation in the environmental assessment process. For category-B projects, the borrower must consult with groups affected by the proposed Program and with local nongovernmental organizations (NGOs) if possible. The consultation needs to be carried out as early as possible in the Program cycle so that views of affected groups are taken into account in the design of the Program and within the mitigation measures proposed. Any grievance redress issues will be resolved according to the Program's Resettlement Framework.

#### 4.2 Required GoA EIA Approvals & Permitting Processes

21. The proposed 4 Bridge Improvement Project in Ganja Region, Agstafa District will be governed by the provision of EP Law, State Environmental Expertise. Therefore requires Environmental Impact Assessment Study and Report and its approval from MENR. The potential river water abstraction also requires permission from MNER. AzerRoadService is presently in the process of obtaining approvals/permissions from MNER
22. **Constitutional Provisions.** The constitution of the Republic of Azerbaijan embodies precepts and principles for environmental protection, ownership of natural resources and preservation of cultural heritage. Article 14 of Chapter III (Basic rights and liberties of a person and citizen) entails the state ownership of natural resources, without prejudice to rights and interests of any persons and legal entities. Article 39 constitutes the right to live in a healthy environment, to gain information about true ecological situation and to get compensation for damage done to his/her health and property because of violation of ecological requirements. Article 40 states the rights to practice and participate in culture and protection of historical, cultural, and spiritual inheritance and memorials. In Chapter IV (Main responsibilities of citizens), Article 77 states the responsibilities for protection of historical and cultural memorials; while Article 78 stipulates the citizen's responsibility for protection of environment.
23. Drawing from the constitutional provisions, the Government of Azerbaijan enacted various legal instruments – Parliamentary legislations that defines and establishes the State regulation of protected natural areas, and the protection and use of the environment and biodiversity; Presidential Decrees and orders, the Cabinet of Ministers resolutions, and By-laws of the executive authorities (Ministries and Committees).

##### 4.2.1 Legal Framework

24. The Laws/Regulations currently in force in Azerbaijan that deal with environmental protection are listed below:
  - (i) Environmental Protection and Utilization of Natural Resources (1992)
  - (ii) Environmental Protection (1999)
  - (iii) State Ecological Expertise (1996)
  - (iv) Environmental Safety (1999)
  - (v) Water Code of the Azerbaijan Republic (1998)
  - (vi) Water Supply and Wastewater (2000)
  - (vii) Health Protection (1999)
  - (viii) Sanitary-Hygienic State (1992), part of GOST
  - (ix) Water quality, air and noise standards: GOST (various years)
  - (x) Program on Strengthening Financial Discipline in the Water Sector (2002)
  - (xi) Improvement of Water Supply Management (2004)
  - (xii) Construction Norms and Regulations: SNiP
  - (xiii) Rule for Use, Protection and Preservation of Trees and Bushes (No 173; September, 2005)
  - (xiv) The Land Code (25 June 1999)



(xv) European Economic Community Directive on Wastewater 91/271/EEC (1991)

25. The fundamental legislation concerning environmental protection and conservation in Azerbaijan is the Law on Environmental Protection of 1999 (EP Law, 1999), which lays down the basis for the legal, economic, and social aspects of environment protection. The objective of this Law is to protect environmental balance thus ensuring environmental safety, prevent the hazardous impact of industry and other activities to natural ecological systems, preservation of biological diversity and proper use of natural resources. Detailed information on the most pertinent laws to be applied for this subproject are explained in Table 1:

**Table 1: Laws & Regulations on Environmental Protection in Azerbaijan**

<b>Legislation</b>	<b>Description</b>
Law on Environment Protection, 1999	<p>This Law establishes the main environmental protection principles, and the rights and obligations of the State, public associations and citizens regarding environmental protection. <b>According to Article 54.2 of the Law, EIA is subject to SEE.</b> This also explains that the MENR is responsible for the review and approval of EIA reports submitted by developers. Furthermore, in Articles 81 and 82 of the Law on Environmental Protection (1999), the Law specifically provides for the application of international agreements in case an international institute or body has provisions that are different from those of the Azerbaijani legislation.</p> <p><b>Articles 35, 36, 37, and 38: Ecological Demands during Project Design and Implementation.</b> During the feasibility study, it should be confirmed that the project will comply with:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> the maximum permitted discharges and emissions of pollutants in the natural environment</li> <li><input type="checkbox"/> the maximum permitted noise and vibration levels, and other harmful physical influences as well as health norms and standards of hygiene</li> </ul> <p><b>Article 50: Ecological Expertise</b> requires identification of impact on environment caused by any activities, examine the results of such impacts and predict possible impacts in accordance with the environmental requirements and qualitative parameters of environment.</p> <p><b>Article 54: Objects of the State Ecological Expertise</b> defines the types of project which require compulsory "State Ecological Expertise (SEE)", i.e. to undergo the systematic EIA process.</p>
State Ecological Expertise (SEE)	SEE mandates an EIA for infrastructure development projects. The objective of the SEE is to identify impacts on the environment caused by construction projects, examine the results of such impacts and propose mitigation measures to prevent adverse effects on the natural environment and people's health. It is

Legislation	Description
	essentially a stand-alone check of compliance of the proposed activity with the relevant environmental standards (e.g. for pollution levels, discharges, and noise).
Law on Ecological Safety, 1999	This law defines legal bases of ecological safety as component safety of the state, society and population, the purpose of which is establishment of legal bases for protection of life and health of the person, society, its material and moral values, environment, including atmospheric air, space, water objects, resources of the ground, natural landscape, plants and animals from danger, arising as a result influence natural and anthropogenic action
Law on Sanitary-Hygienic State (GOST 17.1.3.07-82)	<p>This law serves as a basis for drinking water quality standards and mandatory implementation of sanitary-hygienic expertise regarding chemical and biological standards for water quality. Similarly, noise standards are described in GOST 12.1.003-83. However, the GOST does not specify regulations on permitted effluent discharge levels post wastewater treatment. As such, Azerbaijan has adopted Directive No 91/271 from the European Environmental Commission (EEC) in GOST. This regulation identifies the allowable biological and chemical levels for sewage effluent.</p> <p>Standards/maximum allowable values notified/adopted by Government of Azerbaijan are in appendices – Drinking Water Quality (<b>Appendix 2</b>); ambient air quality (<b>Appendix 3</b>) and noise levels (<b>Appendix 4</b>).</p>
Water Code (1998)	The Water Code (1998) regulates legal relations concerning the protection and use of water bodies (surface, subsoil, and boundary water bodies) in Azerbaijan. The Law details the obligations of the State with respect to the use and protection of water bodies in terms of monitoring and protection schemes as well as the supervision over the use and protection of water bodies. The items most relevant to the Investment Program include the outlining of (i) the use of water bodies as potable and service water; (ii) the use of specially protected water bodies; and (iii) the use of water bodies for the discharge of wastewaters.
Permission for groundwater use - Decision no 133 dated June 6, 1998 of the Cabinet of Ministers	Prior approval/clearance of the Ministry of Ecology and Natural Resources is necessary for the utilization of ground waters
Construction Norms and Regulations	The Construction Norms and Regulations are identified in SNiP which details how to carry out noise reduction measures to assure compliance with the relevant sanitary norms (section 3.9) and it details regulations on the dumping of excess materials (section 3.12). SNIP III-4-80 also details regulations on construction worker's health and safety. Chapters 2 and 5 provide

Legislation	Description
	organizational procedures of construction 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.
Rule for Use, Protection and Preservation of Trees and Bushes (2005)	The Rule for Use, Protection and Preservation of Trees and Bushes (2005) is a regulation that details the way to protect trees and shrubs in case of necessary cutting or replanting. These trees are excluded from the Forestry Fund of the Azerbaijan Republic.
Land Code (1999)	Article 22 of the Land Code (1999) stipulates that the state is required to establish protection zones with a special (restrictive) regime for the purpose of construction and operation of industrial facilities
The European Economic Community Directive on Wastewater (1991)	The European Economic Community Directive on Wastewater (1991) regulates the collection, treatment and discharge of domestic wastewater and wastewater from industrial sectors. The directive includes requirements for monitoring the performance of treatment plants and receiving waters. Also, it mandates measures for sludge disposal and re-use as well as means to re-use treated wastewater.

26. International Treaties/Conventions. Azerbaijan is signatory/party to most of the environmental-related international Treaties, Agreements and Conventions (see Table below). As stated in Article 151 (Legal value of international acts) of the Azerbaijan Constitution, agreements in International Conventions supersede national laws in case of conflict. This principle is embodied in Articles 81 and 82, Chapter 14 (International Co-Operation on Environment Protection Issues) of the Law on Environmental Protection, 1999.

**Table 2: International Conventions Recognized by Azerbaijan**

S. No	International Convention	Year Ratified
1	UNESCO Convention on Protection of World Cultural and Natural Heritage	1994
2	UN Convention for the Protection of the Ozone Layer (Vienna Convention)	1996
3	Agreement on Mutual Cooperation of the Commonwealth of Independent States in the area of Hydrometeorology	1998
4	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and Agreement on Protection of Sturgeons	1998
5	UN Convention to Combat Desertification	1998
6	UN Convention on Environmental Impact Assessment in the Trans-boundary Context (Espoo Convention)	1999
7	Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)	1999

S. No	International Convention	Year Ratified
8	UNECE Convention on Access to Information, Public Participation in Decision- Making and Access to Justice in Environmental Matters (Aarhus Convention)	1999
9	UNESCO Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention)	2001
10	UNECE Convention on the Protection and Use of Trans-boundary Watercourses and International Lakes (Helsinki Convention)	2000
11	UN Convention on Biological Diversity	2000
12	FAO Convention on Plant Protection	2000
13	Protocol on UN Framework Convention on Climate (Kyoto Protocol)	2000
14	Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol)	2000
15	European Agreement about Transportation of Dangerous Goods on International Routes	2000
16	UN Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention)	2001
17	UNECE Convention on Long-Range Trans-boundary Air Pollution	2002

27. According to Azerbaijan regulation, public consultation for any Project has to be carried out twice – first at the detailed design stage (to address all important comments) and secondly at the end of the project when presenting Project results. All Project stakeholders as well as any affected persons (APs) have to be present at the second public consultation. Results of the first public consultation have to be documented in the Environmental Impact Assessment. Azerbaijan mandated the Public Participation in Decision-Making and Access to Justice in Environmental Matters at the UNECE Aarhus Convention in 1999. Since that time, the Aarhus Centre had been open to the public in the office of MENR. All Project documents related with environmental questions have to be stored in Baku's Aarhus Centre for easy access by the public and NGOs' representatives. A copy of the Environmental and Social Assessment documents also has to be filed at the public library (or any other relevant organization) of the in the Project Area and must be accessible in Azeri.

#### 4.2.2 Administrative Framework

28. **Institutions.** There are four principal environmental institutions (or Ministries in Azerbaijan and the NAR) who handle environmental protection, management and operation caused by infrastructure projects. These include (i) MENR, (ii) the Ministry of Health, (iii) the Ministry of Emergency Situations (which implements construction safety supervision), and (iv) AzerSu / State Amelioration and Water Management Agency (SAWMA) who will manage the WSS in their respective areas under the Investment Program:

- (i) **Ministry of Ecology and Natural Resources.** Ministry of Ecology and Natural Resources<sup>1</sup> (MENR) is the primary institution entrusted with the responsibility of environmental protection and implementation of environmental related laws. The functions and activities of the MENR are sub-divided into the following areas: (i) Environmental policy development; (ii) Environmental protection; (iii) Water monitoring

and management; (iv) Protection of marine (Caspian Sea) bio- resources; (v) Forest management; and (vi) Bio-resources and protected areas management. This ministry upholds all natural resource protection laws. The State Ecological Expertise (SEE) acts within this agency on the Program level in reviewing Environmental Impact Assessments (EIAs).

- (ii) **Ministry of Health:** (Sanitary and Epidemiology Service sub-body within Azerbaijan only). Sanitary and hygienic safety is the responsibility of the Ministry of Health. Its main function is the implementation of control over meeting the sanitary and epidemiological rules and standards as well as hygienic standards. This entity implements anti-epidemiological measures throughout Azerbaijan and NAR by legal and physical persons through application of laboratory and sampling controls.
- (iii) **Ministry of Emergency Situations** (Commission of Emergency Situations in the NAR). This agency implements construction safety supervision and standards. Their main involvement in this Program will be to regulate safety on site and to road users.
- (iv) **AzerRoadService Joint Stock Company (JSC):** manages the implementation of all road projects all over Azerbaijan.

#### 4.2.3 GoA EIA Requirements & Review Processes

- 29. State Ecological Expertise (SEE) under the Law on Environmental Protection, 1999, sets out the requirement for environmental assessment in Azerbaijan. Procedures for Environmental Assessment are stipulated therein. The objective of the SEE is to identify impacts on environment caused by development activities/industrial units, examine the results of such impacts and predicting possible ones, in accordance with the environmental requirements and qualitative parameters of environment (Article 50 of EP Law). Article 52 of EP Law stipulates the Objectives and Responsibilities of the State Ecological Expertise.
- 30. The activities, fields and sectors to which SEE would apply are specified in Article 54 (The units controlled by the SEE) of the EP Law as:
  - The State and local programs related to development and placement of productive capacities in governmental and economical institutions;
  - The documentation of technical and economical substantiation, construction (reconstruction, enlargement, and renovation technology) and destruction of economical capacities, as well as assessment of the project influence on environment;
  - Documentation concerning creation of new techniques, technologies, materials, and substances, as well as import of the same from abroad;
  - Draft of scientific-methodical and normative-technical documentation concerning environment protection;
  - Certain ecological conditions caused by improper work of industry and extraordinary situations;
  - Ecological conditions of the regions and individual (separate) natural objects and systems;
  - Provisions of draft contracts stipulating use of natural resources, as specified by the relevant decrees of the concerned executive bodies

31. **Institutions:** State Ecological Expertise (SEE) Department, under the Department of Environmental Policy and Environmental Protection of MENR is responsible for the review and approval of environmental impact assessment (EIA) reports submitted by project proponents.

#### 4.2.4 Permit Processes

32. **EA Process, Review & Approval:** The SEE adopts a 2-stage approach. The first stage takes about a month and entails an initial examination of the application of the proposed activity and the expected impacts. This stage may also include preliminary consultations with other agencies, NGOs, experts and initial public inquiries on the various aspects of the project. When determined that the project or activity will likely cause only minor impacts on the environment, the application may be approved with some conditions. On the other hand, if the activity is assessed to cause significant impacts, a full EIA is required. Subsequently in such situation, a scoping meeting of representatives of the developer/applicant, invited experts and invited members of the public will be organized and to be chaired by the MENR. Based on the outcome of this scoping meeting, the MENR will notify the developer on the required scope and depth of the investigation and public consultation during the EIA study.
33. The second stage, which takes around three months, entails a review and investigation by the MENR of the documents submitted by the developer/proponent. A group of 5-11 expert reviewers and experienced members (e.g. members of the Academy of Science, university staff, or officials from other ministries) will be convened to perform the EIA document review and which will be chaired by MENR. The composition of the review group shall be on the discretion of the MENR but will be taken from a roster of experts who can deal adequately with project-specific environmental issues. The expert group will undertake public submissions, investigations, and consultations relevant to the project impacts as deemed necessary in the review process. Consequently, at the end of this stage, a written review of documentation together with recommendations is submitted by the environmental review expert group to the MENR.
34. The MENR then decides on whether to deny the application or to approve it, with or without conditions. In the case of infrastructure construction projects specified, these conditions include construction phase measures such as site management; noise; dust, discharges to the air land, subsurface or water, solid waste management, emergency contingency plans, etc. These conditions are set to assist the proponent/developer control the environmental impacts such that they are maintained at the acceptable limits. Should the application be approved with conditions, either the activity starts with due consideration on the conditions or the proponent/developer may opt to appeal against the conditions and resolutions may be subjected to judicial proceedings.
35. **Post Approval Monitoring:** During construction of the project, the applicant/developer should ensure adherence to conditions attached to the approval and be responsible in monitoring the developments of the projects along with regular reporting to MENR. The monitoring program of the proponent/developer should be designed to give clear indications prior to conditions being breach. Practical corrective measures should be undertaken by the proponent/developer in order to avoid breach of any conditions stipulated in the approval.

36. The MENR is authorized to issue warning to proponent/developer should it observe that conditions are being breached. In the event, the proponent/developer is obliged to stop the activity which is causing the breach. In such cases, the MENR may reconsider the approval, possibly with the participation of the Environmental Review Expert Group, and the conditions of approval may be reviewed.
37. Should project designs be altered significantly from those presented in the in the feasibility –IEE phase, additional reports on the impacts of the changes may be requested by MENR.

## DESCRIPTION OF THE PROJECT

### 1.0 Major Components and Design Characteristics

#### 1.1 Overview

38. The Four Bridge Improvement Project in Ganja Region, Agstafa District planned to be realized under Asian Development Bank (ADB) funding is intended to optimize social and economic development in the Project Area through improved transport facilities.
39. All our (4) bridges are situated in the Ganja Region and carry regional (R) or local (Y) roads over rivers or railways. The lengths and types of the bridges vary and the existing bridges all show signs of severe distress and lack of maintenance.

**Table 3: General Data on the Four Bridges**

Bridge	01	02	03	04
Road	R-24 Agstafa-Poylu- Sadiqli	R-24 Poylu-Sadiqli	R-24 Poylu-Sadiqli- Gurcistan	Y-05-08 Poylu- Duzqislaq- Qazax
km	2.0	17.0	29.5	0.1
Existing span arrangement (m)	2 x 14, 1 x 22	8 x 21.5	3 x 18	4 x 18
Existing carriageway arrangement (m)	1.4+7.0+1.4	0.2+4.6+0.2	1.2+8.0+1.2	1.4+8.0+1.4
Obstacle crossed	Railway	Kura River	Aji Dara River	Agstafa River
Location: Decimal Degrees (WGS84)	41.1275, 45.4417	41.2420, 45.4396	41.3021, 45.3509	41.2262, 45.4397

40. As shown in the table above 3 of the bridges are located along the R-24, Agstafa – Poylu – Sadiqli – Gurcistan – Georgian Border Road which forms an alternative road connection to the M2 Corridor, Ganja - Gazakh –Georgian Border whilst the Y-05-08 forms a direct connection from Poylu To Gazakh.
41. All four (4) bridges are in a very poor, nearly no longer maintainable condition and should be closed for public traffic with immediate effect (Bridge No. 4 has been closed already). A short summary of the Bridge Inspection undertaken I August 2013 is given below:

#### 1.2 Major Features

##### 1.2.1 Bridge No. 1: R-24 Agstafa-Poylu-Sadiqli Road, km 2+000

42. The bridge was designed under SNIP 2.05.03-84 or previous regulations for A-11 and NK-80 load standards. In February 2011 Azeryolservis was instructed by the Ministry of Transport under Instruction 17/17/4131-12/26 only to allow structural design under A-15 and NK 100 load classes. The bridge is thus no longer fulfilling Azeri Standards.
43. The geometrical layout is also not following applicable standards for Bridges on



Category III roads.

44. The structural elements of the bridge show severe cracks and concrete spalling with substantial corrosion of the reinforcement. Railings are broken or missing, drainage openings are blocked. Wing walls are showing severe damages. The initial inspection and results already received during the detailed investigation revealed that the overall condition of all structural elements is in irreparable conditions.



**Figure 2: Photographs of Bridge No. 1**

#### 1.2.2 Bridge No. 2, R-24 Poylu-Sadiqli Road, km 17+000

45. The bridge was designed under SNIP 2.05.03-84 or previous regulations for A-11 and NK-80 load standards. In February 2011 Azeryolservis was instructed by the Ministry of Transport under Instruction 17/17/4131-12/26 only to allow structural design under A-15 and NK 100 load classes. The bridge is thus no longer fulfilling Azeri Standards.
46. The geometrical layout is also not following applicable standards for Bridges on Category III roads.
47. Bridge no. 2 is a steel truss bridge which was originally constructed in 1897 and reconstructed in 1969. All steel elements connected with rivets, no welding joints could be observed. Following observations were made during inspection:
- there are defects and damages in number of truss elements, joints and connections;
  - several fatigue cracks have been recorded in steel construction;
  - corrosion of elements observed in many parts and anticorrosive protection of the steel elements is in poor condition (severe contamination, cracks, peeling etc.);
  - one of abutments trusses is inclined by approximately 12 cm (probably car crash);
  - one of end support of span is slightly tilted (possibly due to soil deformation under supports);

- footway and curbs are missing.

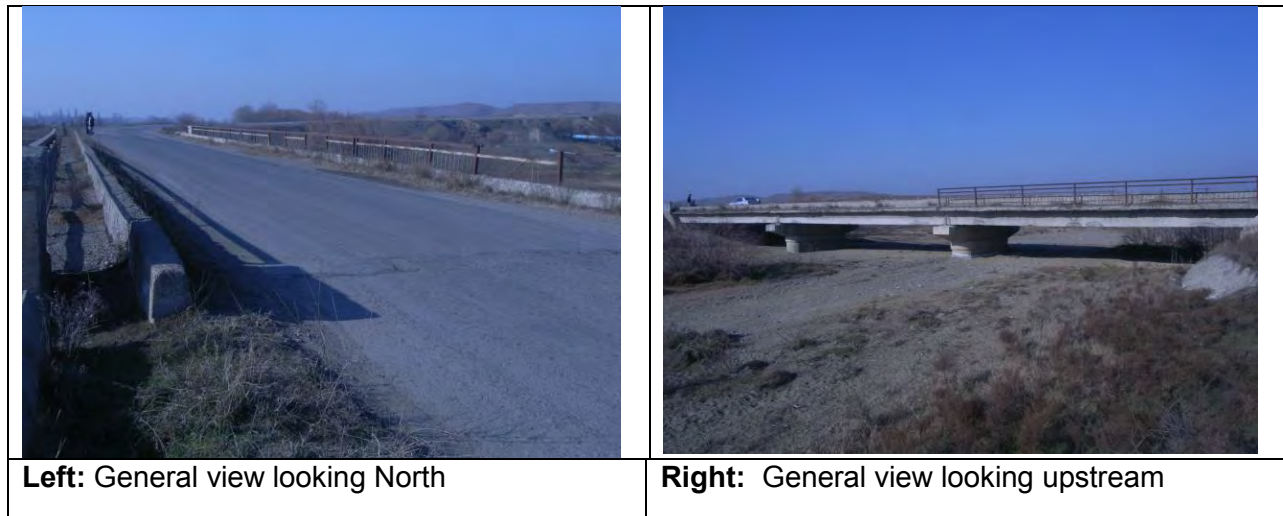
48. In general the steel structure of the bridge is in a non-acceptable and irreparable condition and none of the structural elements should be used any longer. Asphalt concrete pavement and reinforced concrete plates of carriageway must be fully substituted.



**Figure 3: Photographs showing damage of Bridge No. 2**

1.2.3 Bridge No. 3, R-24 Poylu-Sadiqli-Gurcustan Road, km 29+500

49. The bridge was designed under SNIP 2.05.03-84 or previous regulations for A-11 and NK-80 load standards. In February 2011 Azeryolservis was instructed by the Ministry of Transport under Instruction 17/17/4131-12/26 only to allow structural design under A-15 and NK 100 load classes. The bridge is thus no longer fulfilling Azeri Standards.
50. The geometrical layout is also not following applicable standards for Bridges on Category III roads.
51. Bridge no 3 is a simply supported beam bridge with reinforced concrete t-beams. The span arrangement is 3 x 18 m. The structural elements of the bridge show severe cracks and concrete spalling with substantial corrosion of the reinforcement. Railings are broken or missing, drainage openings are blocked. Wing walls are showing severe damages. The initial inspection and results already received during the detailed investigation revealed that the overall condition of all structural elements is in irreparable conditions.



**Figure 4: Photographs of Bridge No. 3**

1.2.4 Bridge No. 4, Y-05-08 Poylu-Duzqislaq-Qazax Road, km 0+100

52. The bridge was designed under SNIP 2.05.03-84 or previous regulations for A-11 and NK-80 load standards. In February 2011 Azeryolservis was instructed by the Ministry of Transport under Instruction 17/17/4131-12/26 only to allow structural design under A-15 and NK 100 load classes. The bridge is thus no longer fulfilling Azeri Standards.
53. The geometrical layout is also not following applicable standards for Bridges on Category III roads.
54. Bridge no 4 is a simply supported bridge with reinforced concrete t-beams. Nearly all structural elements of the bridge show severe damages and deformation. In particular columns and foundations are heavily damaged. The bridge is in dangerous condition and all movements on the bridge should be prohibited.



**Figure 5: Photographs showing damage of Bridge No. 4**

## 2.0 Planned Construction

### 2.1 Bridge No. 1, R-24 Agstafa-Poylu-Sadiqli Road, km 2+000

55. The bridge will be replaced at the existing location. The geometry and design parameters will be changed to be in accordance with National Standards for Bridges on Category III roads. The structural layout will be changed to a single span bridge (instead of a triple span bridge) both, due to safety reasons and cost optimization. The head clearance will be adjusted to comply with National Railway Design Standards.
56. The bridge reconstruction requires the re-design and reconstruction of some 180 m of approach road on each side of the bridge to eliminate safety hazards on the approaches and to gain the required additional head clearance. This reconstruction can be completely secured in the existing Right of Way.
57. During construction, demolition of the existing bridge, a temporary diversion has to be established. This temporary diversion can be constructed mainly on existing roads but for some 100 m on each side of the railway line temporary land acquisition is required. The land is state owned.

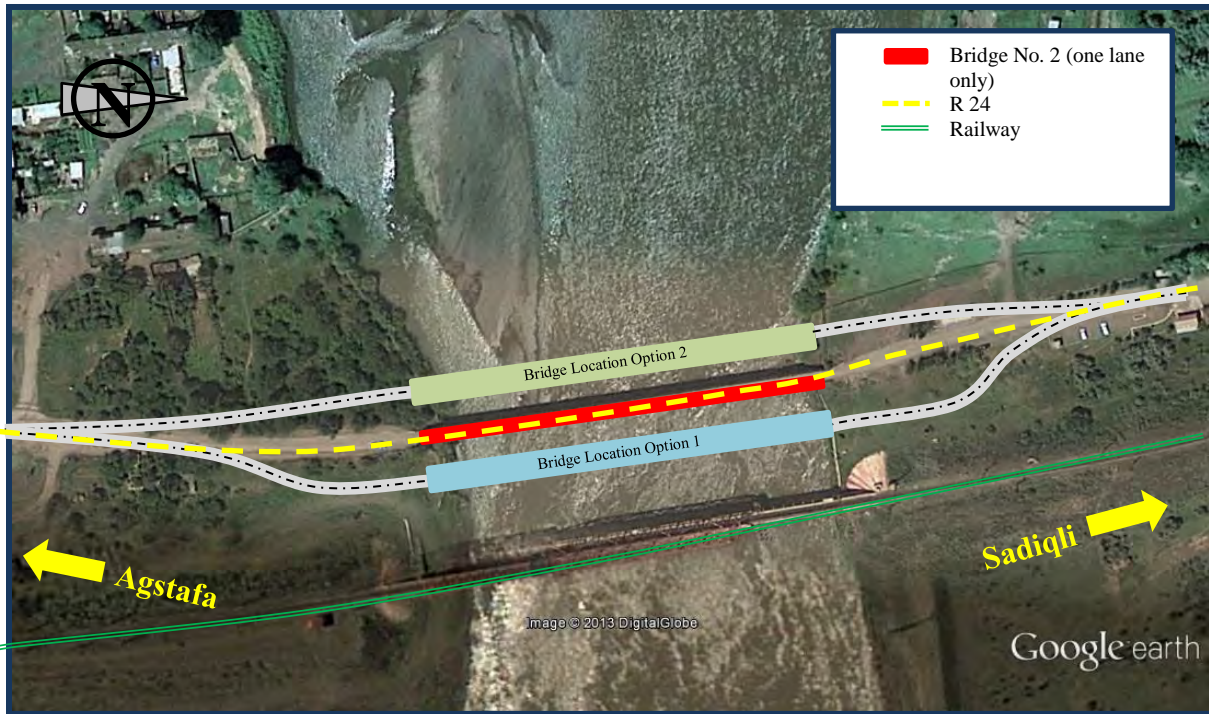


Figure 6: Bridge No. 1 Location Map with Reconstruction Alignment

<b>Table 4: No. 1 - Bridge Data</b>			
<b>Location:</b>	Road R-24 (km 2.0)	<b>Total length:</b>	21.80 m
<b>Road category:</b>	Cat. III	<b>Span length:</b>	21.80 m
<b>Type of Cross section:</b>	Railway	<b>Material:</b>	Concrete
<b>Design load:</b>	HK 100	<b>Deck constr. method:</b>	Erection by crane
<b>Deck type:</b>	Precast pre-stressed beams/ RC slab cast in-situ	<b>Construction time:</b>	1.5 years

2.2 Bridge No. 2, R-24 Poylu-Sadiqli Road, km 17+000

58. The bridge cannot be replaced at the existing location as no diversion for local short distance traffic can be offered but has shown a substantial volume not only in terms of vehicle traffic but also in terms of pedestrian traffic and cattle crossing. The bridge must thus be maintained under operation during construction.
59. The geometry and design parameters will be changed to be in accordance with National Standards for Bridges on Category III roads. The structural layout will be changed to a four span bridge (instead of a multiple span bridge) both, due to achieve an up to date design standard and cost optimization.
60. Two solutions have been investigated, up- and downstream. The up-stream variant has substantial advantages in the road geometry and safety but will need some land acquisition and is combined with some minor environmental impacts. The downstream variant can be designed and constructed within the corridors of the exiting road and the neighboring railway bridge and might thus be located in the State owned Right of Ways. As the land to be acquired is state owned and as the environmental impacts are negligible, the upstream variant is recommended for construction (Option 2).
61. The bridge reconstruction requires the re-design and reconstruction of some 250 m of approach road on each side of the bridge to eliminate safety hazards on the approaches, to keep the desired design standards for Category III Roads and to gain the required additional head clearance.

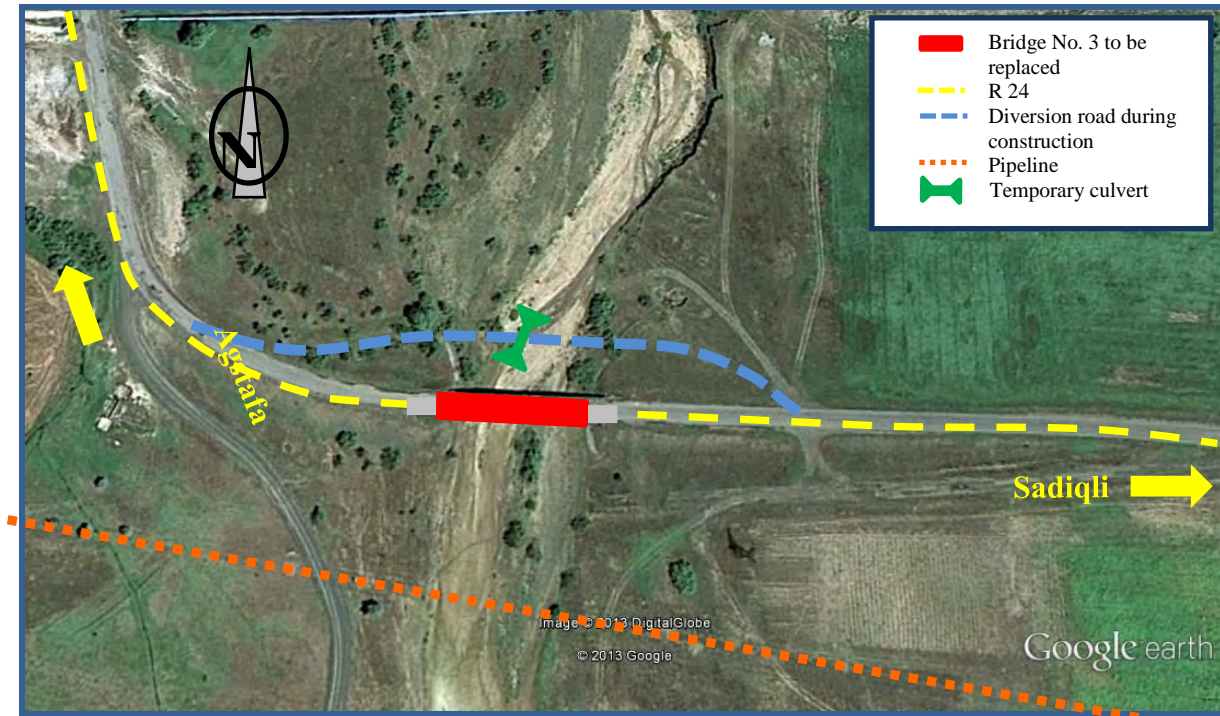


**Figure 7: Bridge No. 2 Location Map with Reconstruction Alignment**

Table 5: No. 2 - Bridge Data			
<b>Location:</b>	Road R-24 (km 17)	<b>Total length:</b>	170.00 m
<b>Road category:</b>	Cat. III	<b>Span length:</b>	42.4+85+42.5 m
<b>Type of Cross section:</b>	Kura river	<b>Material:</b>	Precast concrete
<b>Design load:</b>	HK 100	<b>Deck constr. method:</b>	Segmental/short line precast
<b>Deck type:</b>	Precast pre-stressed box girder	<b>Construction time:</b>	2 years

2.3 Bridge No. 3, R-24 Poylu-Sadiqli-Gurcustan Road, km 29+500

- 62. The bridge will be replaced at the existing location. The geometry and design parameters will be changed to be in accordance with National Standards for Bridges on Category III roads. The structural layout will not be changed (triple span bridge).
- 63. The bridge reconstruction requires the re-design and reconstruction of some 70 m of approach road on each side of the bridge to secure Category III Road Standards. This reconstruction can be completely secured in the existing Right of Way.
- 64. During construction, demolition of the existing bridge, a temporary diversion has to be established. This temporary diversion can be constructed mainly on existing roads but for some 100 m on each side of the river temporary land acquisition is required. All land to be acquired is state owned.



**Figure 8: Bridge No. 3 Location Map with Reconstruction Alignment**

Table 6: No. 3 - Bridge Data			
<b>Location:</b>	Road R-24 (km 2.0)	<b>Total length:</b>	54,00 m
<b>Road category:</b>	Cat. III	<b>Span length:</b>	18+18+18 m
<b>Type of Cross section:</b>	Aji Dara river	<b>Material:</b>	Concrete
<b>Design load:</b>	HK 100	<b>Deck constr. method:</b>	Erection by crane
<b>Deck type:</b>	Precast pre-stressed beams/ RC slab cast in-situ	<b>Construction time:</b>	1.5 years

2.4 Bridge No. 4, Y-05-08 Poylu-Duzqislaq-Qazax Road, km 0+100

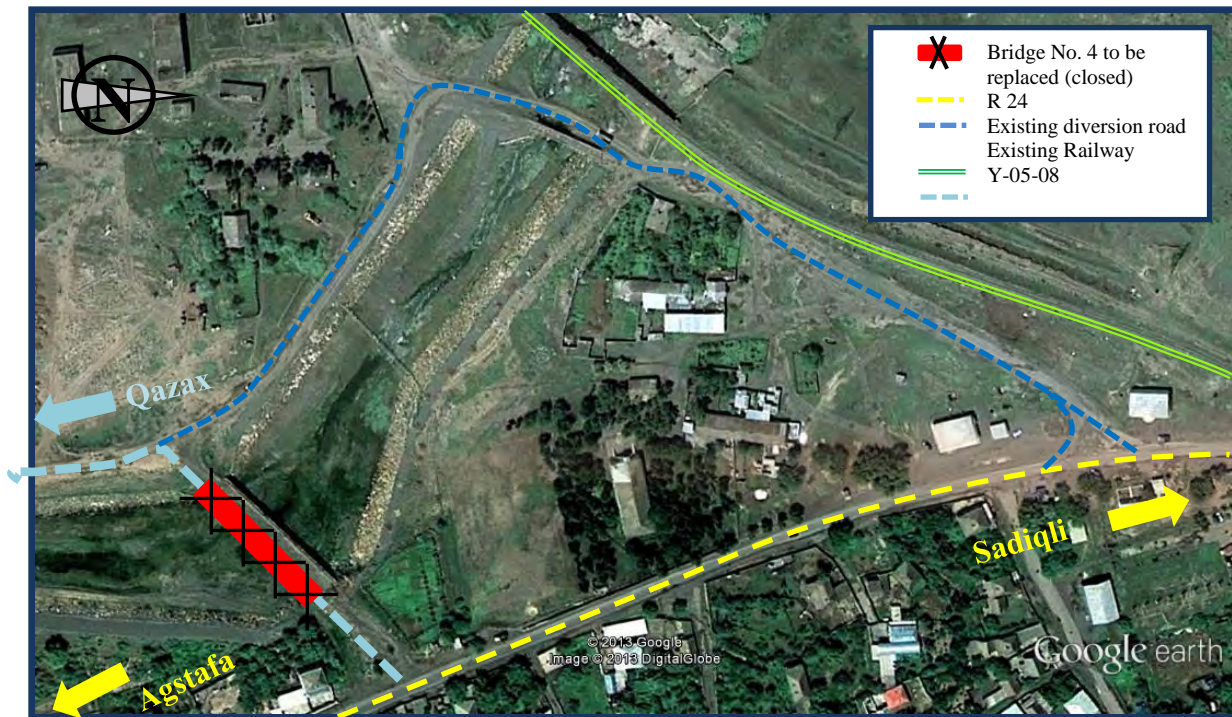
65. The existing bridge is already closed for any kind of traffic and a temporary diversion has been constructed some 500 m downstream close to the new railway bridge. Theoretically the bridge can thus be replaced at the existing location using the already constructed diversion road during construction but based on our site investigation results a relocation should be considered. The existing bridge was constructed in a sharp bent of the Agstafa River where during high water tables the water velocity is high with strong scouring. This has caused the erosions of the abutments and piers which finally led to the deterioration of the existing bridge.

66. The new railway bridge and also the temporary diversion both have been built at a location with less hydrologic problems. We have thus studied 2 alternatives, one reconstruction at the existing location and an alternative location in between the existing diversion and the new railway bridge.

67. The geometry and design parameters will be changed to be in accordance with National

Standards for Bridges on Category III roads. The structural layout will be changed to a three span bridge (instead of a four span bridge) both, to achieve an up to date design standard and cost optimization.

68. As mentioned before 2 solutions have been investigated but as the reconstruction at the existing location is more economical and has no problems in land acquisition and no environmental impacts, this variant is recommended for construction.



**Figure 9: Bridge No. 4 Location Map with Reconstruction Alignment**

<b>Table 7: No. 4 - Bridge Data</b>			
<b>Location:</b>	Road R-24 (km 2.0)	<b>Total length:</b>	72,00 m
<b>Road category:</b>	Cat. III	<b>Span length:</b>	24+24+24m
<b>Type of Cross section:</b>	Agstafa river	<b>Material:</b>	Concrete
<b>Design load:</b>	HK 100	<b>Deck constr. method:</b>	Erection by crane
<b>Deck type:</b>	Precast pre-stressed beams/ RC slab cast in-situ	<b>Construction time:</b>	1,5 years

### 3.0 Temporary Construction Facilities

#### 3.1 Construction Camp

69. The proper maintenance of all the service and sanitary facilities at the contractor's work camp falls under the direct responsibility of the contractor with the supervision of the construction supervision engineer for the project. The sanitary facilities or ablution include toilets, urinals, showers, washstands and a laundry area. Water should be provided of adequate quantity and acceptable quality complying with the national



standards. Provisions of such facilities should conform to local and cultural traditions of the project site. In addition, safety and security of the area should be maintained at all times. Areas to be used as work camps or for purposes of the project should be approved by the local authorities and the construction supervision engineer.

70. The civil works contract will require the Contractor to be responsible for temporary acquisition and reinstatements of all lands needed outside the road reserve – for construction camps, offices, borrow pits, material storage/processing sites and haul roads. The Contractor will select the land parcels required and negotiate directly with the landowner.
71. Within the work camp, the contractor should exercise reasonable measures to prevent harm and to minimize the impact of his operations on the environment and on the socio-economic conditions along the road, and shall ensure that his employees do likewise. The contractor shall make his employees aware that hunting, trapping or dealing in wildlife will not be tolerated and shall take all possible steps to ensure that his employees and those of his sub-contractors do not engage in these activities. The contractor is expected to provide means to minimize work camp environmental problems as follows:
  1. The contractor shall prepare a layout of the work camp and details of the proposed measures to address adverse environmental impacts resulting from its installation. Such plans shall be submitted to the ARS/PIU-ESS and construction supervision engineer prior to establishment of the work camps and implement provisions of such plans. Prior to establishment of the work camps, conduct consultations with local authorities to identify sources of water that will not compete with the local population.
  2. The contractor shall establish a solid waste management plan covering provision of garbage bins, regular collection and disposal in a hygienic manner, as well as proposed disposal sites for various types of wastes (e.g., domestic waste, used tires, etc.) consistent with appropriate local and national regulations. In addition, spoil from earthwork, and general construction wastes are the responsibility of the contractor to collect and dispose of in conformance with local standards. Spoil disposal sites will be identified prior to the start of construction.
  3. To control dust nuisance within the work camp and to minimize impacts to the surrounding community the contractor shall undertake measures such as watering of the areas, covering of any nearby stockpiles and provision of any vegetative measures.
  4. All water used in the work camp shall be discharged in a manner which does not cause erosion, pollution or nuisance to landowners, or other persons within or adjacent to the work camp. The Contractor shall take all measures necessary to prevent the discharge into rivers, streams or existing irrigation or drainage systems of any water containing pollutants or visible suspended matter. The contractor shall not interfere with the natural flow of rivers, streams, or existing irrigation or drainage systems for any purpose without the prior consent of the construction supervision engineer.

5. The contractor shall come up with sewage management plan for provision of sanitary latrines and proper sewage collection and disposal system to prevent pollution of watercourses and subsurface waters.
6. The contractor shall provide a description and layout of equipment maintenance areas and lubricant and fuel storage facilities including distance from water sources and irrigation facilities. Storage facilities for fuels and chemicals will be located away from watercourses. Such facilities will be bounded and provided with impermeable lining to contain spillage and prevent soil and water contamination.
7. In terms of erosion and siltation concerns, the contractor shall take all precautions to prevent the erosion of soil from any lands used or occupied by him, and from the bed or banks or any river, stream, irrigation or drainage system. Likewise, the contractor shall take all precautions to prevent the deposition of excavated or eroded material in any river, stream, irrigation, or drainage system.
8. In the interest of preserving native vegetation, the contractor is prohibited from using tree parts from the site for any aspect of the construction of his facilities or those for the Engineer. This includes props etc. needed to cast lintels and the like. Further the contractor shall not use wood burning stoves for cooking or heating.
9. The contractor shall realize that local markets will not be able to supply bulk food supplies for his labour force without causing severe shortages for the local population. Bulk food supplies shall only be purchased from towns approved by the construction supervision engineer.

### 3.2 Material Sources

72. Considerable volume of materials will be obtained from borrow areas and will be used for construction of bridge approach roads. Several potential borrow areas are quite apparent in the general vicinity. Contractors involved in the recent road reconstruction works also can readily identify potential areas for borrow materials which can be used for the bridge approach roads. The prospective contractor will probably identify his own source of materials. However, the materials need to be approved by the construction supervision engineer prior to using them for the project.
73. Should the contractor be sourcing the materials from existing and operational quarry site, the contractor should exert influence on the operator that proper operational and management measures be instituted to minimize impacts to the general environment. Should the contractor decide to open a new borrow site, the guidelines below should be followed in order to minimize impacts associated with the operation of borrow areas:
  - All of the required environmental approvals should be secured and extraction and rehabilitation activities consistent with the requirements of MENR and/or permit conditions be carried out;
  - Prior to operation of the borrow areas, the contractor should submit to ESS and construction supervision consultant (CSC) the following:

- 1) A plan indicating the location of the proposed extraction site as well as rehabilitation measures to be implemented for the borrow areas and access roads upon project completion;
  - 2) A dust management plan which shall include schedule for spraying water on access road and schedule of the equipment to be used;
  - 3) A schedule of regular dust suppression on all unpaved access roads during the construction period, particularly in sections where critical receptors, such as settlements, are located;
  - 4) Location map of stockpiles which should be away from watercourses to avoid obstruction of flow and siltation;
  - 5) Cover on haul trucks to minimize dust emission and material spillage;
74. Plan to undertake regular maintenance and repair of access roads to their original condition whenever necessary

#### **4.0 Land Acquisition & Resettlement**

75. The parcels of land that will be affected by the Bridge Project proposed are those along the proposed approaches for Bridge No. 2. These are state-owned with an approximate area of 0.3 hectares. Around six (6) minor trees will be affected and one temporary structure, belonging to police may have to be dismantled and relocated nearby. Several electric poles will have to be and a gas pipeline may have to be relocated.
76. Acquisition of the said state- owned lands will be arranged between the various government bodies. The ARS OJSC will inform the State Land and Cartography Office (SLCC) regarding the affected state-owned land. Temporary impacts will be the responsibility of the Contractor as stipulated in the Civil Work Contract. The particular aspects for each bridge are as follows:
- **Bridge No. 1, R-24 Agstafa-Poylu-Sadiqli Road, km 2+000.** The Bridge will be reconstructed along the same alignment; no land impact for the bridge reconstruction itself is expected. To enable linkage for existing vehicular traffic, the existing local roads west of the bridge site will be connected over the railways by gravel road and culvert arrangements. The connecting detour road will traverse state-owned property only and with no existing privately owned structures will be affected.
  - **Bridge No. 2, R-24 Poylu-Sadiqli Road, km 17+000.** The new bridge will be constructed parallel to the existing bridge; it will be upstream and to the west of the existing bridge. The land parcels at the bridge abutments are state-owned and no land acquisition from private owners will occur. The construction of a new bridge the approach at north side will affect the current police station and customs office facilities that control traffic and cargo coming from- and going to Georgia. Since these are government-owned facilities, proper coordination with relevant agencies needs to be done. These structures are made of light materials and they can be easily dismantled and transferred to the either side of the proposed new north bridge approach road.
  - **Bridge No. 3, R-24 Poylu-Sadiqli-Gurcustan Road, km 29+500.** The Bridge will be constructed at the same location. A temporary diversion road will be arranged north

and downstream of the existing bridge. The area consists of vacant lands and owned by the state and with no land purchase from private owners necessary. To enable temporary use of land for detour road, ARS will have to coordinate the temporary detour road with relevant state agencies.

- **Bridge No. 4, Y-05-08 Poylu-Duzqislaq-Qazax Road, km 0+100.** Being located in Poylu town, the fourth bridge is near various houses and privately owned land. However, no land acquisition is necessary since the road and bridge right of way still exist and no structures were illegally built and the new bridge will be built on the same alignment.

## PHYSICAL & BIOLOGICAL BASELINE, IMPACTS & MITIGATION

### 1.0 Geology and Soils

77. The Kura valley was noted to have developed over a long geological time span; however its recent geometry was shaped only during the Oligocene period. The Kura River trough in which the project lies is divided into two sub-basins by transversal uplifts – (i) The Middle; and (ii) The Lower Kura River sub-basins. R24 lies primarily on quaternary sediments with some Neogene sediments on the northern side. Soils in the Kura valley generally have high clay and sand content, with considerable presence of pebbles and gravel. Such can be attributed to the alluvial patterns that persisted in the areas. Generally, the soils are classified as leptosols (a shallow soil over hard rock, highly calcareous material or gravel) and regosols (weakly developed mineral soil in unconsolidated material), which are common in eroding lands often found in arid and semi-arid areas and in mountain regions.

### 2.0 Hydrology

78. The project area is within the Kura River catchment, which is Azerbaijan's main river and accounting for around 90% of the country's surface water resources. As it flows westwardly to the Caspian Sea the Kura feeds two major reservoirs, namely the ShamKura and the Mingechevir Reservoirs, which are harnessed for power generation and irrigation purposes. It was observed that water quality in the Kura River in the section upstream of Ganja is satisfactory, however it was noted that the river becomes polluted downstream of Yevlakh due to the discharge of untreated waste water from the populated settlements and other discharges from industrial activities in its catchment.

79. In terms of water quality, it is important to note that the Kura River's watershed covers a vast area and its headwaters start outside the territory of Azerbaijan. Dischargers from major industrial cities like Tbilisi and Rustavi in Georgia contribute to the degradation of the water quality. Siltation and certain chemicals in agricultural activities also end up in the waters of Kura River. In a study<sup>1</sup> conducted on the River-Araz river basin identified the major sources of pollutants into the Kura River as (i) untreated municipal wastewater leads to organic pollution; (ii) extensive use of pesticides and fertilizers in agriculture leads to high nutrient; concentrations; (iii) Industrial wastewater leads to chemical pollution; and (iv) mining activities lead to heavy metal contamination.

80. In terms of water quality impacts the four bridges included in the Project can generally be defined as follows: (i) Bridge No 1 crosses over railway, thus no water contamination threat; (ii) Bridge No. 2 crosses Kura River which can be considered as important in terms of water quality issue; (iii) Bridge No. 3 crosses over Aji Dara River, a local tributary of Kura River with seasonal flow, while; (iv) Bridge No. 4 crosses over a meandering branch of Agstafa River draining to Kura River which is also having seasonal. For the Bridges Nos. 3 and 4 where seasonal flow occurs, it would be advisable to confine the construction within the non-rainy season to minimize threat of water quality contamination. At Bridge No. 2, where the flow is all-year round, the

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<sup>1</sup> BMZ-KfW. Adaptation to Climate Change in the Kura-Aras River Basin – River Basin Snapshot. Sept. 2010.

contractor should obtain baseline water quality information prior to construction and monitor the water quality on a monthly basis. The parameters to be measured should include at the minimum –Total Suspended Solids (TSS), Biological Oxygen Demand (BOD), Dissolved oxygen (DO), Fecal coliform and Oil and grease, oil constituents, and pH. Any work activities that can result to potential contamination should be monitored by the CSC environmental specialist. Contractor's camp and work yard should be situated at considerable distance from the banks of any river.

81. Geologically, the groundwater in the project area is confined to gravel-shingle and sandy formations of the Quaternary and the Upper Pliocene age, and is widely used for water supply and irrigation. Groundwater depths in the project area near Agstafa River was said to be around 5m.

### **3.0 Air Quality and Noise**

82. During construction phase, it is expected that air quality will undergo some moderate and temporary deterioration. Generally, dust from construction traffic and elevated levels of nitrogen oxide (NO<sub>x</sub>) and sulphur oxide (SO<sub>x</sub>) from construction equipment exhaust will be the primary pollutants. The dust will settle on nearby vegetation, crops, structures and buildings, and may cause some degree of respiratory stress to nearby residents. These impacts will be mitigated by continuously spraying of water on the road construction site and in other areas where dust will have to be controlled. The exhaust fumes from trucks and heavy equipment should meet emission standards. The Contractor shall undertake baseline instrumental monitoring during the Pre-construction phase. Parameters to be monitored to establish a baseline include: (i) Total Suspended Particulates (TSP); (ii) Sulfur Dioxide (SO<sub>2</sub>); (iii) Nitrogen Dioxide (NO<sub>2</sub>); and (iv) Carbon Monoxide (CO) at the vicinity of the bridge construction sites.
83. With regards to other impacts, it is important that the contractor and the local officials would be able to work together to control potential problems and minimize complaints from the local population. Among the available measures to reduce air pollution and emission levels are the following:
- (i) maintenance of construction equipment to good running condition and avoidance, as much as possible, of idling of engines which can contribute to exhaust emission;
  - (ii) banning of the use of machinery or equipment that cause excessive pollution (e.g., visible smoke) on account of their age and fuel consumption levels;
  - (iii) establishment of aggregate, asphalt, and concrete plants as far away as possible (minimum 500 m) from human settlements and operation of such facilities within the terms of Government pollution control guidelines;
  - (iv) submission of a dust suppression program which provides detailed action to be taken to minimize dust generation and equipment to be used to ESS, PIU and CSC prior to construction;
  - (v) Bypass roads may be located at considerable distance from residential areas to minimize air quality impacts, among others;

84. During the road rehabilitation phase, heavy machinery will be used, and although these activities may be intermittent and localized, they nevertheless contribute tremendous amounts of sustained noise during equipment operation. In Azerbaijan noise standards were based on the former Soviet Union standards as shown in the Table below:

**Table 8: Maximum Allowable Noise Levels**

Maximum allowable noise levels, dBA		Description of Area
23 pm to 7 am	7 am to 23 pm	
45	60	Residential area of settlements
55	65	Industrial areas
35	50	Places of public amusement and tourism areas
30	40	Sanitary areas and resorts
45	50	Agricultural areas
up to 30	up to 35	Strictly protected areas
Note: Project designer may establish stricter maximum allowable noise standards in case of correspondent justification		

85. A number of mitigating measures to minimize impacts of excessive noise and vibration can be done by the contractor during the conduct of his work as follows:
- (i) Work will be restricted to between 0600 to 2100 hours within 500m of the settlements.
  - (ii) A limit of 70 dBA will be set in the vicinity of the construction site and strictly followed;
  - (iii) Machinery to be used for the construction should be equipped with mufflers to minimize the generation of noise;
  - (iv) Whenever possible the local population should be advised of occurrence of elevated noise levels to enable them to take the necessary preparatory measures.

#### **4.0 Biological Environment**

86. Owing to complex geological history, varied climate, and its location at the crossroads of Asia and Europe, Azerbaijan is relatively richly endowed in terms of its ecological resources with large proportion of endemism host to a large number of relict species. Though partially depleted due to pollution and poor management under Soviet and post-Soviet rule, improvements are noted with a number of relevant international treaties, notably the Convention on Biodiversity.
87. In terms of fishery resources, particularly in the Kura River and Agstafa River, the species to be found includes Caspian roach (*Rutilus rutilus caspicus*) Barbel (*Barbus*

sp.), Chub (*Leuciscus cephalus*) and Brown trout (*Salmo trutta fario*). These species are not classified in the IUCN Red List as endangered nor critically endangered.

88. Due to conversion of land into agricultural use, the wildlife species are limited to animals tolerant to such conversion such as the common Fox (*Vulpes vulpes*), Striped field mouse (*Apodemus agrarius*), and Social Vole (*Microtus socialis*); and small animals such as Striped-neck Terrapins (*Mauremys caspica*) brown rats (*Rattus norvegicus*), Coypu (*Myocastor coypus*) Jerboa (*Allactaga elater*) and Hedgehogs (*Erinaceus concolor*). Ten species of amphibians and 52 species of reptiles are recorded to be endemic Azerbaijan, and none are categorized as rare or endangered. Since it is believed that most of the reptile species thrive in semi-desert areas and they are unlikely to inhabit the majority of the project sites.
89. As agricultural zones are in general considered more “bird-friendly”, birds frequent the area. Although already considered far from the sites a small Important Bird Area (IBA) exists in the Agstafacay valley around 5 km north of M2 and a little farther from Bridge No. 1. Agstafacay IBA has been noted to be home to at least one breeding pair of the Lesser Spotted Eagle (*Aquila pomarina*) and numerous Imperial Eagles<sup>2</sup> (*Aquila heliaca*). This IBA is also a very common breeding area of Kingfishers (*Alcedo atthis*) and European Rollers<sup>3</sup> (*Coracias garrulus*).

## 5.0 Sensitive Habitats & Protected Areas

90. There are no protected areas very close to the project sites. The closest one is around 20 km west of R24, which is the Gara-Yaz State Reserve. This area was designated as protected area to preserve riparian woodlands for Kura River, which are tugai ecological systems, occupying the lands in the mid stream of the Kura Rive. The flora species include types of trees as white poplar, oak, alder-tree and white acacia. This area is also home to sharp-clawed animals the most widely spread are wild boar and deer, among birds; pheasant, thrush, dove, etc

## 6.0 Environmental Aspects of the Bridge Sites

91. Based on the site visits of the bridge sites the following were gathered in terms of the environmental and social aspects:
92. **Bridge No. 1, R-24 Agstafa-Poylu-Sadiqli Road, km 2+000.** This bridge site is located at the northern edge of the town of Agstafa surrounded by farmlands and primarily rural in character. The distance from the bridge to the nearest houses is around 120-130 meters which can be a concern during the construction period. Farm and domesticated animals may roam around during the construction stage of the project can pose some safety issues. Two railroad crosses underneath the Bridge No. 1 and their operations pose a certain conflict with the bridge reconstruction works. It is also important to maintain transport connectivity, hence a detour road should be established which should consider minimal impact to transport routes but maintain safety to motorists and local inhabitants. Maintenance of the detour road shall be responsibility of the winning contractor as well as reinstatement of such road at the end of the project.

<sup>2</sup> IUCN Red List status: Vulnerable (VU)

<sup>3</sup> IUCN Red List status: Near Threatened (NT)



93. The general vicinity is a vacant area aside from the railway infrastructures which run under the bridge. West of the bridge, a small creek traverses the state-owned property and flows south to north underneath the double railways through a pipe culvert. Local vegetation thrive in the vicinity of the consisting primarily of small trees, bushes and grasses, but no flora species of importance will be affected. As this will be the site of the diversion road, it is important that mature trees should be avoided and small trees should be to be replanted or replaced. The winning contractor shall reinstate the distal parts of the temporary diversion road (i.e. those parts already existing today) at the end of the project and remove the central section thereby reinstating this part (including the railway section concerned) to its original state.
94. Since the surrounding areas are farmland, no endangered species are expected. The small creek is primarily serving as drainage in the area and will remain connected by pipe culverts to maintain the natural flow.
95. **Bridge No. 2, R-24 Poylu-Sadiqli Road, km 17+000.** This bridge crosses the Kura River which is quite wide at this location with somewhat deep and steep banks. The river seems to be deep and the flow can become turbulent during the rainy season. The existing steel bridge is one-lane and serves as the major connection of traffic in the area and across the Kura River and to border towns of Sadiqli in the Azerbaijan side and Ruisbolo in the Georgian side. The major settlement is found on the south bank of Kura River with the nearest structure located at around 100m from the existing bridge abutment. At the north end of the bridge, a customs check-point office and police stations are located for the purpose of checking cargoes coming from Georgia. An existing and operational railway runs parallel to the bride to the east which is around 50 meter from the existing Bridge No. 2. around 20 meters to the current railway bridge, a new railway bridge has been constructed which later will be serve as connecting bridge to parallel lines in the future. Although this bridge is already completed, as of the moment, this bridge is not in operation. One crucial issue being faced right now is how to maintain transport connectivity during construction period. The existing steel bridge is the only Kura River crossing in the locality and it seems that allowing the bridge to exist is the viable option. This should be subject to further evaluation in later stages as the feasibility study proceeds.
96. A number of native trees, such as Elmwood, Poplar, etc., may be affected during the construction of the bridge approach road. Small trees can be replanted elsewhere, while for bigger trees which need to be cut down to make way for the bridge approaches, replacement will be done by planting more trees of similar species. Generally, grazing farm animals roam the bridge area owned by the village residents and wild animals are rarely spotted. In the Kura River, a number of fish species thrive such as Caspian roach (*Rutilus rutilus caspicus*) Barbel (*Barbus* sp.), Chub (*Leuciscus cephalus*) and Brown trout (*Salmo trutta fario*). Small-scale fishery activities in Kura River seem to be engaged in by nearby residents but these are mainly for subsistence and recreation.
97. **Bridge No. 3, R-24 Poylu-Sadiqli-Gurcistan Road, km 29+500.** Bridge No. 3 is the farthest from Agstafa of the four bridges and this crosses over the Aji Dara River, a local tributary of Kura River with seasonal flow. No settlement is found near this bridge. The only structure that exists is a gas-pump facility located around 150m northwest of the existing bridge. In summer months, the river is somewhat dry and of minimal flow as the water may seem to run under deposits of gravel on the river bed. Cluster of indigenous

trees, shrubs and grasses thrive along the river banks. This vegetation is of no special significance but care should be exercised to preserve and protect them whenever possible especially when a detour road will be constructed to maintain transport connectivity.

98. In summer months, the river is somewhat dry and of minimal flow as the water may seem to run under deposits of gravel on the river bed. Cluster of indigenous trees, such as Tamarix, shrubs and grasses thrive along the river banks. These vegetations are of no special significance but care should be exercised to preserve and protect them whenever possible especially where the detour road will be constructed for transport connectivity. Since the river has low flow in summer and practically dry, no fish are found. Some wild animals and endemic species of reptiles may be approaching the road, but they are normally repulsed by human activity.
99. **Bridge No. 4, Y-05-08 Poylu-Duzqislaq-Qazax Road, km 0+100.** The fourth bridge is located in Poylu Village over a meandering branch of Agstafa River along the Poylu-Duzqislaq-Qazax Road which branches southwesterly from the Agstafa-Poylu-Sadiqli Road. This road is at the verge of collapse with one of the piers shearing off from the foundation. As observed, river scouring would have produced such situation and the river is somewhat wider at this bridge point. The bridge is sealed from any vehicular access for safety reasons. Alternate bridge crossing has been constructed around 230 meters downstream which is also currently defunct and also currently closed to traffic for safety reason. To enable connectivity, a pipe culvert crossing has been installed over which the current road is connected to enable traffic to cross. This existing road runs close to a railway located north of this pipe culvert crossing.
100. This fourth bridge is near the houses and reconstructing the bridge at this existing location will entail some concerns to the nearby inhabitants. Since alternate crossings are in operation, traffic will not be impaired by the construction of the bridge. The approach to the bridge and also the deviation roads already exist and no trees will be affected in the area. The faunal effect if any would be more on the aquatic resources in Agstafa River; however, this will be mainly confined to the period of bridge construction.

## **7.0 Potential Environmental Impacts and Mitigation Measures**

101. Bridge construction entails a number of activities which are expected to introduce impacts and disturbances to the general environment, especially during the construction period. Most of these impacts are confined within the bridge construction sites while some activities can affect the outlying areas or even a wider area, especially if not properly mitigated. Direct impacts are those that are clearly introduced by the project during the construction period such as modification of the physical land features at the specific construction site. Indirect impacts are those that are consequences of the changes in the environment or secondary effects due to the introduced changes, which can occur or accumulate beyond the construction phase. Both of these direct and indirect impacts can be classified as minimal to adverse depending on the level of intensity that they affect the natural environment components, such as air and noise, flora and fauna, water, topography, and land use.
102. During the pre-construction phase, it is important the Client (ARS) should be guided and

reminded of certain environmental issues to be avoided. Air quality issues arising from the siting and operation of material sources (borrow pits and quarry) and processing plants (asphalt plant and cement batching plant) can be avoided by ensuring that these sites are sufficiently far from residential areas. Permits to these sites should be provided only if they are at reasonably far distance from any residences. Material sources should not be within any protected area and measures should be in-place to ensure that any materials are transported properly with avoidance of droppings along the transport routes which can in turn inconvenience local residents or damage infrastructure. Prior to approval of extraction of materials, the Engineer should ensure that the Contractor submits a Site Reinstatement Plan – borrow pits should have Borrow Pit Action Plan and quarries should have Quarry Reinstatement Plan. Prior to setting up campsites, the Contractor should provide to the Engineer a general layout of the plan and elaboration of measures to manage waste water and sewage, silted water, solid waste, liquid materials (oils, fuels, lubricants, solvent, etc) and any toxic or hazardous waste. In addition, the following plans should be provided: (i) Dust Suppression Plan; (ii) Waste Management Plan; (iii) Health and Safety Plan; (iv) Air Quality Management Plan; (v) Water Quality Management Plan; (vi) Noise Management Plan; (vii) Waste Management Plan; and (viii) Emergency Response Plan

103. During the detailed engineering phase, the design engineers should be guided on a number of items need to be considered in the production of bridge designs and which will have relevance to the environmental aspects of the project. These items are as follows:

- To minimize impacts of erosion, side slopes of embankments will be designed to reflect soil strength and other considerations as included in the project specifications in order to reduce slips or erosion; for embankments greater than 6m, stepped embankments will be used.
- For geology and seismic conditions, earthquake loading shall be applied to the design of structures, to ensure that seismic events do not have negative impacts during the operational phase of the Project.
- Considerations on hydrology – (i) drainage patterns should be improved in the designs; (ii) a design discharge of 50 years return period is considered for culverts, and 100 years of bridges.
- Structural service life for bridges – minimum service life expectancy of 75 years.
- On historical and archaeological sites – no significant encroachment to any historical or archeological site eventually discovered during Detailed Design.
- Flora - Contractor shall ensure that roadside activities such as asphalt plants, construction camps and other ancillary features are properly sited as agreed with the relevant CEP. The Contractor should avoid loss of trees, where possible, and should employ techniques such as asymmetrical widening. Where trees must be felled, the Contractor shall ensure that each one removed should be replaced by at least two new saplings of the same species or other at suitable locations, all as designated by the tree owner.
- Health and Safety - Contractor shall ensure that traffic safety issues shall be accounted for during the design phase of the Project, including incorporation of: (i) Safety barriers; (ii) Traffic signs; (iii) Road crossings; (iv) Speed bumps; and (v) Speed limits.

104. In the actual bridge construction phase, practically most of the significant impacts are likely to occur on the account of the actual disturbance to the existing environment. The construction would entail a series of activities at the specific work sites and in other selected areas for material sources, processing plants, campsites and vicinities. At the initial phase, except for Bridge No. 2, the old bridge structures will be demolished since the new bridges will be reconstructed at the same spot as the old ones. In so doing for Bridge 1 and Bridge 3, detour roads will be established. For Bridge No. 2 over the Kura River, the new bridge will be upstream of the existing one and the old bridge will not be demolished but will continue to provide the traffic connection until the new bridge will be completed. No detour road will be required for Bridge No. 4 because an existing temporary road and bridge exist downstream of this bridge. When the new Bridge No. 4 will be completed, traffic will be shifted to this new bridge.
105. The typical construction process will entail, first the closure of existing traffic to the bridge sites and establishment of detour road. The provision of the new detour road will entail, stripping and clearing of vegetation, excavation, filling and leveling of the area, provision of embankment fill and necessary surfacing for the existing traffic. Some temporary drainage works may be provided and necessary connection works to existing roads. These works by themselves disturb the natural surroundings, and affect vegetation. The traffic will also disturb the once less-travelled local roads and dust would be elevated in summer months. It is important that measures for proper maintenance of the detour road be established to respond to traffic and community safety, control of dust, noise and emissions. Replanting of affected trees should be done as soon as possible and schemes for detour roads should favor tree preservations. Waterways should be respected and contamination should be prevented.
106. The next phase would entail demolition of existing bridges. This will involve breaking the structures at the existing connections and removal of deck and girder elements by use of heavy equipment. These old bridge components will be placed in designated areas which will not impede traffic and cause safety concerns to the general public. The bridge abutments and underlying foundations will be excavated and removed to give way for replacement structures. This breaking, demolition and removal of old elements will generate considerable noise and dust and chunks of debris will drop into the existing waterway. As observed, the Agstafa and Aji Dara Rivers have low flows in summer and risk of water contamination is practically low at these times. Hence, demolition and construction activities will be highly advisable in the summer months.
107. The succeeding steps will involve construction of the new bridges starting with the substructure such as the foundation systems and piers. This will be followed by the superstructure elements of girders, deck slab and railing. Parallel to this would be the construction of approach roads, which will entail embankment filling, subbase, base course and asphalt pavement layer construction. In the end the final wearing course will be laid along all throughout from the existing road to the approach roads, onto the deck slab in such a manner to have smooth layer of road and bridge pavement.
108. The construction of foundation will entail excavation and depending on the type of footing may require pile construction. Bridge No. 2 over the Kura River will entail pile construction as foundation support for the piers. Such construction will entail considerable disturbance to the underlying river bed and increase siltation during pile

driving phase. It is important the Contractor finds ways to minimize disturbances of the bed as much as possible and ensure also that no contamination occurs during usage of pile driving equipment. The construction of new bridge abutment for Bridge No. 2 will be entail sheet piling to prevent side slope collapse during excavation. It is important that during this phase, soil materials are not dropping into Kura River but are removed toward the bank side of the river.

109. The construction of the superstructure components such as the girder and deck slab will involved installation of formworks, casting of concrete and in some instances, post tensioning of tendons. Since, the type of bridge construction is not definite as the moment, the important guidelines to be brought forward is the use of precast elements to minimize pouring and casting of superstructure elements over water to minimize contamination. Concrete batch plants will provide the necessary concrete for these structural elements from approved sites with operational guidelines in accordance with environmental protocols and industry standards.
110. For the pavement works along the approach and the wearing course over the bridge deck will entail impacts very similar to a normal road construction. Embankment works will entail transport of approved fill materials from borrow pits. The suitable materials for subbase and base course will come from quarries or borrow pits of approved properties. These pavement substructures will be engineered and compacted to desired degrees with the use of graders, and compactors in accordance with designs and specifications. The asphalt pavement layers will be provided by asphalt plants with crushed stones and rocks for the aggregate requirements. It will be the responsibility of the Contractor that asphalt plant would produce the necessary required bituminous mix in conformance to environmental requirements for asphalt plant siting and operations.
111. During the actual construction of the bridges, there are a number of impacts that the contractor should be aware along with the corresponding measures to mitigate these impacts. These impacts and/or issues are categorized according to typologies with their corresponding measures and presented as follows:
  - **Air Quality:** The issues are (i) Open burning of waste materials; (ii) Fuel Emissions; (iii) Exhaust emissions from the operation of construction machinery; (iv) Fugitive emissions from quarries and asphalt plants; and (v) Dust generated from haul roads, unpaved roads, exposed soils and material stock piles. The mitigation measures in these instances consist of ways to prohibit burning, minimize emissions as much as possible and control dust in the most practical means.
  - **Topography:** The concerns are on: (i) Cut and Fill Requirement particularly on handling stockpiled materials; (ii) Slope Stabilization through re-vegetation; (iii) Operation of Quarries and control of materials; and (iv) operation of borrow pits and their reinstatement. The mitigation measures include control of materials such that they do not affect adjacent lands and to confine construction materials within designated areas. Crusher operations should not result in adverse or undesirable impact to any residential area and provide operational guidelines to eliminate contamination and pollution. Reinstatement procedure is part of the contractor's obligation in the opening and operation of borrow pits.
  - **Soils:** Contamination issues and other soil related issues include (i) Erosion; and (ii) Contamination due to Spills or Hazardous Materials. The corresponding measures include proper engineering of slopes and stabilization bio-engineering

measures; and provision of necessary measures to prevent, avoid and eliminate risk of soil contamination.

- **Hydrology:** In terms of hydrology, the following are the important considerations during construction period: (i) Maintenance of drainage and prevention of flooding; (ii) Maintenance of drainage and sewerage in Construction Camps and Storage Areas; and (iii) Hydrology and water quality impacts during bridge construction. The measures to maintain hydrology and sound water quality at the construction site involves protection of existing waterways, drainage and irrigation facilities; provision of proper drainage and sewerage facilities and prevention of contamination to any receiving water bodies or surrounding soils; and proper bridge construction methodology to avoid siltation and water contamination.
- **Flora and Fauna:** Specific to the bridge construction sites, mostly impacts to thriving flora and vegetation includes (i) Loss of flora; (ii) Affected flora and fauna; and (iii) issues on Protected Areas. The loss of any flora should be mitigated by replacement of proper indigenous species; prohibition of cutting of trees at campsites or any vicinities of the project; endemic flora and fauna species should be protected and avoidance of trapping of small animals; and contractor to secure certification that any work will not affect any protected area.
- **Waste and Spoil:** Part of the critical issues that may arise during the construction is the proper handling of (i) Spoil; (ii) Inert Solid & Liquid waste; (iii) Asphalt; (iv) Hazardous Waste. Measures manifesting that correct protocols are followed includes securing proper permission from the supervising engineer; proper containment, storage, handling, transport and disposal of liquids, asphalt and hazardous waste

112. The details of the identified environmental measures are presented in the Environmental Management Plan Tables.

## SOCIOECONOMIC BASELINE, IMPACTS & MITIGATION

### 1.0 Social and Economic Resources

#### 1.1 Regional Information

113. The roads (R-24 and Y-05-08) where the Four Bridges Improvement Project is part of traverse two (2) Administrative Districts, namely Agstafa and Gazakh, belonging to Ganja-Gazakh Economic Region. The total population for the two (2) Districts as of 2012 is 173,300 in which Gazakh has the bigger population. The total land area for the two districts is around 2,524.00 km<sup>2</sup>. This information is presented in the Table below:

**Table 9: District Administrative Hierarchy and Population of Four Bridges**

District	Total Land Area (Km <sup>2</sup> )	No of Villages	No of Settlements	Total Population <sup>4</sup>
Agstafa	1,504.00	29	9	81,900
Gazakh	1,020.00	34	-	91,400
<b>Total</b>	<b>2,524.00</b>	<b>63</b>	<b>9</b>	<b>173,300</b>

Source: <http://www.stat.gov.az/source/regions/>

114. In terms of household utilities, comparatively with other regions more was undertaken with respect to the maintenance of such utilities for the Ganja-Gazakh Economic Region in the last decade. Electricity is generally available in the region but households are somewhat constrained due to the current high cost. Expansion of gas supply needs to be finalized for the Ganja-Gazakh Economic Region. Piped water has a wide coverage, and this is a basic need, it is currently being improved. There is a high percentage of existence of household sanitation (bathroom and sewerage) correspondingly indicating high consciousness of people in terms of sanitation. Another aspect that needs improvement is the heating system, and this is understandable since at present, individual households take care of their own heating requirements. Communication via telephone and internet is available.
115. In terms of medical and educational facilities, until the last decade there has been a general lack of such infrastructure in the Ganja-Gazakh Economic Region with buildings and equipment requiring rehabilitation, and the insufficiency of supplies along with the issues of underpaid and under-trained staff. However, as a result of the State Program on Social—Economic Development of the Regions for the 2004-2008, 2009-2013<sup>5</sup> years substantial improvements in the education and health sectors, such as construction of new, and reconstruction of the number of existing schools, provision of modern educational equipment, construction of new and modern health facilities, the governmental support in establishing medical industries for better provision of the health facilities with medicines and equipment, etc., took place.. Thus, there are one Diagnostic Center, seven (7) hospitals, twenty (20) ambulatory - policlinics, seventeen (17) medical centers are serving people in Ganja. Whereas in Agstafa, thirty-two (32) medical centers in the villages and settlements, one (1) Central Hospital, one (1) Muganli village hospital and one (1) Central polyclinic.

<sup>4</sup> as of Jan 01, 2012

<sup>5</sup> <http://www.stat.gov.az/source/regions/>

116. With respect to income in the Ganja-Gazakh Economic Region, the average monthly income is AZN189,6; while the national figure is at AZN190,9. This shows that the study regions do not vary much from the rest of the country. Baku has a per capita monthly income of AZN214.1.
117. In Ganja-Gazakh the primary source of income is self-employment. The breakdown of monthly income is shown in the Table below:

**Table 10: Monthly Income Profile of Ganja-Gazakh Economic Region per capita in 2012**

Income Sources	AZN Share	% Share
<b>Total income</b>	<b>189.6</b>	<b>100</b>
Income from employment	45.5	24.0
Income from self employment	50.7	26.8
Income from agriculture	34.8	18.4
Income from rent	1.4	0.8
Income from property	0.5	0.3
Current transfers received	36.0	19.0
Pensions	32.5	17.2
Benefits and social contributions	1.9	1.0
Social transfers in kind	1.6	0.8
Other income	20.6	10.9
Income from other households	12.1	6.4
money received from abroad	8,6	4,5

Source: [http://www.stat.gov.az/source/budget\\_households/indexen.php](http://www.stat.gov.az/source/budget_households/indexen.php)

## 1.2 Local Information

118. **Occupations.** Agstafa District has a gender ratio (male: female) of 0.49 for the overall district. The base of the district economy is agriculture. The total area of the lands suitable for agricultural use in the region is 23,725 ha. Crops include grains, vegetables, and fruits. Animal husbandry is the most developed sector of agriculture (13,672 ha). Due to some limited opportunities in the town, 3% of men work abroad to bring home money to their families. Also, women work in the public services such as in teaching, medicine, and nursing. Agriculture is also the backbone of the economy of Agstafa. For the years 2007-2012, the territory of agricultural lands has increased from 19,387 to 23,725 hectare<sup>6</sup>. The main crops are cereals, root crops, and vegetables, but in the agricultural expansion area, sunflowers, potatoes, vegetables, grape are mainly produced. Livestock-raising and poultry production also contributes substantially to the agro-based economy.
119. **Health Care.** There is a relatively poor representation of health care facilities within the Agstafa District but hospitals and medical institutions exist in Ganja and Gazakh.
120. **Education.** There is a relatively poor supply of pre-school and school institutions but pre-school and schools exist in Ganja and Gazakh. Overall, the literacy rate for Agstafa District is approximately 99.5%.

<sup>6</sup> <http://www.stat.gov.az/source/agriculture/>



121. Agstafa and Poylu can be classified as settlements with intensive agriculture as the predominant land use in the surrounding. Many houses have small private gardens. However, there are no significant ecological resources, nor rare or endangered flora or fauna within the settlement boundaries and in the vicinity of the bridge sites.
122. No historical, archaeological or cultural sites are located in the vicinity of the bridges and at borrow pits and quarries planned to be used for material extraction. No national reserve is located at or in the vicinity of the bridge construction sites or planned borrow pits and quarries.

## **2.0 Social Safeguard Aspects at the Bridge Sites**

### **2.1 Bridge No. 1, R-24 Agstafa-Poylu-Sadiqli Road, km 2+000**

123. **Social Impacts:** This bridge site, located at the northern edge of the town of Agstafa, is surrounded by farmlands and primarily rural in character. The distance from the bridge to the nearest houses is around 120-130 meters which can be a concern during the construction period. The contractor may be requested to mitigate any excessive noise-, dust- and other pollution according to best practice approach during construction (including but not limited to e.g. watering of temporary gravel surfaces; location of construction plants –if any- downwind and in sufficient distance to the nearest settlements; implementation of air pollution control systems in plants and vehicles; and other)
124. **Safety issues:** In compliance with national regulations the Contractor will ensure that the construction site is properly secured and all construction related activities are properly regulated. Specific safety issues particular to Bridge no. 1 are:
125. Farm and domesticated animals may roam around the site during the construction stage of the project and can pose safety issues. Safety measures mitigating the effects of livestock movements –if any- may need to be considered by the winning construction contractor.
126. Two railroads cross underneath of Bridge No. 1 and their operations pose a potential safety risk during bridge reconstruction works. Implementation of proper safeguards at the bridge construction site is required to guarantee the safety of all stakeholders (construction team, rail, road and pedestrian) at all times. Appropriate warning signage, safety barriers and awareness campaigns are to be implemented by the winning construction contractor: The site will be clearly visible and the public be warned of all potential hazards. Staff training, highlighting the safety issues arising in particular from the railway passing underneath will be carried out and also include guidelines for site access and all near-site heavy traffic. Particular reference shall also be made to threats arising from high voltage cables underneath the construction site. Rules of conduct for the passing of trains shall be established and maintained by all personnel on site. Specifically trained monitoring personnel shall be provided by the winning contractor.
127. The temporary detour road should consider minimal impact to current transport routes while maintaining safety to all motorists (including the railway) and local inhabitants and livestock. Clear signposting and maintenance of the detour road including all safety

measures shall be responsibility of the winning contractor. To enable minimal interruptions of the railway operations and guarantee safety, the diverted traffic should be controlled by watchmen who would momentarily stop vehicular movement when trains will be near the crossing. Such traffic control will be done at all times so as to maintain traffic safety and avoid any untoward accidents. Upfront coordination with the competent authorities (railway) is advisable

128. **Gender / Ethnic related:** The Bridge itself is nonspecific to gender- or ethnic related issues. However, the winning construction contractor shall be requested to apply, conduct and maintain the following outputs throughout the construction:

- Increase employment diversification and number of women on the Construction Site
- Decrease wage difference between men and women for employment in Construction (if any)
- Effective Anti-Trafficking campaigns in project areas
- Increase women participation in traffic safety campaigning programs
- Ensure full awareness on HIV/AIDS among the people living adjacent to project roads
- Increase livelihoods of poor female headed households
- Increased employment and income of ethnic Minorities, women headed and vulnerable households

## 2.2 Bridge No. 2, R-24 Poylu-Sadiqli Road, km 17+000

129. **Social Impacts:** The major settlement area is found on the south bank of Kura River with the nearest structure located at around 100m from the existing bridge abutment (see Fig. 3). The proximity can be a concern during the construction period. The contractor may be requested to mitigate any excessive noise-, dust- and other pollution according to best practice approach during construction (including but not limited to e.g. watering of temporary gravel surfaces; location of construction plants –if any- downwind and in sufficient distance to the nearest settlements; implementation of air pollution control systems in plants and vehicles; and other)

130. **Safety issues:** In compliance with national regulations the Contractor will ensure that the construction site is properly secured and all construction related activities are properly regulated. Specific safety issues particular to Bridge no. 2 are:

131. The new bridge will cross the Kura River which is about 170 - 200m wide at the projected location with somewhat deep bed and steep banks. Implementation of proper safeguards at the bridge construction site is required to guarantee the safety of all stakeholders at all times. Appropriate warning signage, safety barriers and awareness campaigns are to be implemented by the winning construction contractor: The site will be clearly visible and the public be warned of all potential hazards. Staff training, highlighting the safety issues arising in particular from bridge construction above a major river will be carried out and also include guidelines for site access and all near-site heavy traffic. Particular reference shall also be made to threats arising from high water levels and strong currents that may occur in the river. To the best of our knowledge, there is no shipping or other water bound recreational traffic on the Kura to

date, no safety issues stemming from water bound traffic have been identified. As this may change over the construction period, clear signage of the construction site also on the waterway may be required.

132. Farm and domesticated animals may roam around the site during the construction stage of the project and can pose safety issues. Safety measures mitigating the effects of livestock movements –if any- may need to be considered by the winning construction contractor.
133. One crucial issue being faced right now for the Bridge No. 2 is how to maintain transport connectivity during the construction period. The existing steel bridge is the only Kura River crossing for vehicular and all other traffic (pedestrians, livestock) in the region and it seems that allowing the bridge to exist to serve its purpose appears to be the only viable option although the bridge is seriously damaged. The state of the existing bridge must be monitored throughout the construction of the new bridge to ensure continuous safety for all vehicular, pedestrian and other traffic. The existing bridge may be further seriously affected if increased loads from construction related traffic occur. This may relate directly to the construction of Bridge number 2 but also to the transport of materials and equipment needed for the rebuilding of – in particular- bridge no. 3 some 6 Km to the northwest. The winning construction contractor shall thus be requested to constantly monitor the status of the existing bridge and take any measures necessary for rehabilitating any kind of damage that may compromise safety for any traffic going over the existing bridge until the new bridge is in operation.
134. To ensure the safety of all stakeholders the construction site and also the existing bridge shall be lighted at night.
135. Upon completion of the project, the old bridge can either be taken down, left as is without use (i.e. disconnected at the abutments), or be rehabilitated to enable for instance pedestrian and livestock traffic. If the bridge is being dismantled, appropriate care needs to be taken to ensure the safety of all stakeholders and protect the environment, in particular the Kura River. Left standing without use, access to the old bridge needs to be cut off to prevent any unwanted usage of the structure and related accidents. If the old bridge is reinstated to allow for e.g. pedestrian and livestock traffic, appropriate safety measures during construction need to be taken. If implemented, the rehabilitation should consider all issues needed to guarantee the safety of the future stakeholders and users including but not limited to the structural integrity of the bridge, guard rails, appropriate lighting, safe access to the bridge at both abutments, and clear signage. Deviating pedestrian and livestock travel to the old bridge will enhance the safety for all traffic on the new bridge.
136. **Gender / Ethnic related:** The Bridge itself is nonspecific to gender- or ethnic related issues. However, construction related objectives may be considered. These have been described for bridge no. 1 and are not repeated here for the sake of brevity and conciseness; please refer to the appropriate section.

### 2.3 Bridge No. 3, R-24 Poylu-Sadiqli-Gurcustan Road, km 29+500

137. **Social Impacts:** No settlement is found near this Bridge No. 3. The only structure that

exists nearby is a gas-pump facility located around 150m southwest of the existing bridge. No impact on this facility is expected either from bridge construction or from the temporary deviation road.

138. **Safety issues:** In compliance with national regulations the Contractor will ensure that the construction site is properly secured and all construction related activities are properly regulated.
139. **Gender- / Ethnic related:** The Bridge itself is nonspecific to gender- or ethnic related issues. However, construction related objectives may be considered. These have been described for bridge no. 1 and are not repeated here for the sake of brevity and conciseness; please refer to the appropriate section.

#### 2.4 Bridge No. 4, Y-05-08 Poylu-Duzqislaq-Qazax Road, km 0+100

140. **Social Impacts:** Since Bridge No. 4 is near the village residences, construction nuisances will occur. The contractor will be requested to mitigate any excessive noise-, dust- and other pollution according to best practice approach during construction (including but not limited to e.g. watering of temporary gravel surfaces; location of construction plants –if any- downwind and in sufficient distance to the town; implementation of air pollution control systems in plants and vehicles; guaranteeing access to all private property, shops and other buildings impeded by the construction works or support installations). The mitigation shall be in accordance with the IEE/EMP.
141. **Safety issues:** In compliance with national regulations the Contractor will ensure that the construction site is properly secured and all construction related activities are properly regulated. Specific safety issues particular to Bridge no. 4 are:
142. The main hazards are considered to stem from the close proximity of the construction site and the population of Poylu. Therefore the implementation of proper safeguards at the bridge construction site and the deviation road is required to guarantee the safety of all stakeholders at all times. Appropriate warning signage, safety barriers and awareness campaigns are to be implemented by the winning construction contractor: The site will be clearly visible and the public be warned of all potential hazards. Staff training, highlighting the safety issues arising in particular from bridge construction in towns will be carried out and also include guidelines for site access and all near-site heavy traffic. Particular reference shall be made to the welfare of potentially highly unaware inhabitants such as old people, people with hearing, visual or mobility impediments or children.
143. Domesticated animals may roam around the site during the construction stage of the project and can pose further safety issues that need to be considered by the winning construction contractor.
144. To ensure the safety of all stakeholders the construction site and also the deviation road shall be lighted at night.
145. **Gender- / Ethnic related:** The Bridge itself is nonspecific to gender- or ethnic related issues. However, construction related objectives may be considered. These have been

described for bridge no. 1 and are not repeated here for the sake of brevity and conciseness; please refer to the appropriate section.

### 3.0 Potential Social Impacts and Mitigation Measures

146. During the construction phase, social impacts would include disruptions to services, nuisances due to construction activities, socio-economic conflicts, including community health and safety specific to construction sites. Likewise, social issue and problems may arise not only at specific work sites but also in those temporary facilities used for construction activities such as quarry sites and borrow pits, excess soil disposal sites, contractor's workers camps, and asphalt plants. It is expected that impacts from these types of activities will cease once the contractor completes the project and demobilizes from the site. Among the social concerns and associated mitigation measures in the bridge construction include the following:
- **Land productivity:** The primary issue here is the loss of land for agricultural production. The corresponding measures include preservation of land by ensuring that LARP measures are undertaken prior to the start of construction.
  - **Land Use:** In this aspect one major concern is the establishment of Construction Camps and other ancillary facilities. As the Contractor is the primary responsible party, he should ensure the general sanitation of the area and that he secures permission on the use of land and be responsible for any impacts adjacent to his campsite.
  - **Transport and Infrastructure:** As clearly emphasized the bridge construction results in transport and facility interruptions such as (i) Road closures, existing bridge closure, diversions and blocking of access routes; and (ii) Electrical Systems. Measures to avoid and mitigate inconveniences to the public should be provided consisting of establishing alternative routes and maintenance of access. In addition, utility interruptions should be kept at the minimal and safety measures should be in place in the presence of HV lines at the bridge construction sites.
  - **Historical and archeological areas:** In the instances that important archaeological finds are discovered, measures should be undertaken to preserve any of these items in accordance with Azerbaijan Law and to notify relevant agencies responsible for such items.
  - **Noise:** Construction noise and vibration are unavoidable nuisances generated at worksites. To minimize these, the contractor shall perform measures such as control of noise sources, site control, limitations on working hours, community awareness, installation of necessary gadgets to muffle sound and lessening sound levels and generation.
147. The details of the identified social measures are presented in the Environmental Management Plan Tables.

## **PUBLIC CONSULTATION, INFORMATION DISCLOSURE, GRIEVANCE REDRESS MECHANISM**

### **1.0 Process Undertaken During Project Design**

#### 1.1 Public Consultations

148. In accordance with ADB's Public Communications Policy (2005), a public consultation meeting was arranged on 23 October 2013 in Agstafa at 10-11AM. This was organized by ARS-PIU through official communication to the Agstafa Executive Power inviting stakeholders for the Four Bridges Improvement Project. The invitees for the public consultation consisted of:

- Agstafa District's infrastructure and utility Representatives (*electricity, gas, water, telephone and radio communication lines, etc.*)
- Local Railway Authority Representative
- Executive Power Representative and Administration Deputy
- Local NGO's
- Interest Groups (*Business people, establishment operators, etc*)
- Road Maintenance Division of Rayon
- Municipal Executive Power Representative for the following villages: ***Poylu, Qiraq Kesemen, Poylu Qesebes, Saloglu, Soyuqbulaq, Kocvelili, Muganli, Sadiqli, and Boyuk Kesik*** (*villages close to the four bridge sites*)
- Local residents of ***Agstafa City and aforementioned villages***

149. During the said public consultation the Consultant (Kocks Consult, GmbH), prepared power point presentation regarding the technical features of the project and explained the potential environmental and social impacts with corresponding mitigation measures. This event was also attended by ARS-PIU representative<sup>7</sup>, who clarified issues and responded to questions raised by the attendees. Technical issues related to the project were responded by the Consultant representative<sup>8</sup>.

#### 1.2 Comments Received & Responses

150. The public consultation was attended by around forty-four (44) participants, which was held at the YAP Building in Agstafa City (See Annex 1-A for the List of Attendees). After the powerpoint presentation, an open forum and question and answer portion followed. At this instance, the participants were able to express what they thought about the project and were given a chance to ask clarificatory questions. At the same time, sheets of paper were distributed for those who would prefer to write their questions or comments rather than openly raise them during the forum. The questions raised during the forum were responded right away, while those written will be responded to if they were not clarified during the open forum portion. The questions raised were as follows:

- Will the bridges be built simultaneously?
- Will Azeri company supervise the works? Who will be engineering company?

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<sup>7</sup> Mr. Vugar Pashayev, ARS-PIU representative in the 23 Oct. 2013 public consultation in Agstafa City

<sup>8</sup> Mr. Samuel E. Sapuay, International Environmental and Social Specialist, Kocks Consult GmbH

FOUR BRIDGES IMPROVEMENT PROJECT  
GANJA REGION, AGSTAFI DISTRICT, ROADS: R 24 and Y-05-08

- Does the bridge, considering it as Category II, take into account pedestrian walkways?
- Bridge No. 2 will be constructed over river, and we have gas pipeline in that place. Is it considered in this project the use bridge for relocation the gas pipeline for the adjacent villages?
- There is another bridge existing by the railway at Km 19. Is it also being planned for construction of that bridge?
- Will the bridge be constructed on road going to Sarahasamli Village above river?
- Will you construct bridge on roadway going to Khilkina Village (Aghstafa)?
- You are requested that a next 5<sup>th</sup> bridge be construct at Aghstafa region, Garahansali road area, above the bridge 4<sup>th</sup> bridge

151. The responses to these questions are found in Annex 1-B and Annex 1-C. Below also are photos of the public consultation. Over all, the project has positive support from the attendees of the public consultation and they expressed appreciation on the initiation of the Four Bridge Improvement Project.



**Figure 10: Poweipoint presentation at the Public Consultation**



**Figure 11: Open Forum Question & Answer at the Public Consultation**



## Information Disclosure

152. Once the IEE has been approved by MENR and cleared by ADB, this document will be made available at public locations in Azeri language and will be disclosed to a wider audience via the ADB website. In addition, periodic environmental monitoring reports shall be submitted by Implementing/Executing Agencies during project implementation and correspondingly also be uploaded in the ADB website.
153. Should additional information be required at any time in the project, the public may visit the ARS-PIU or interact with the construction supervision consultant who will be selected for the project. On-site consultations will be held for clarifications and provision of necessary information to the public and the stakeholders on as need basis.

## 2.0 Grievance Redress Mechanism

154. As the work is being done in an inhabited area, most of the impacts are construction- related, and therefore it is anticipated that improper or inadequate implementation of Environmental Management Plan may lead to disturbance and inconvenience to local people. In order to provide a direct channel to the affected persons for approaching project authorities and have their grievance recorded and redressed in an appropriate time frame, PMF will establish a Grievance Redress Mechanism, which will be operational throughout the construction period.
155. A complaint register will be made available at the site office of the contractor, with a display board indicating availability of such facility. This will accept complaints regarding the environment safeguard issues in implementation of the subproject. The grievances received and actions taken will be included into the environmental monitoring reports submitted to ADB. The following process will be followed in grievance redress: Complaints received (written or oral communication) will be registered in Complaint Register assigning complaint number with date of receipt. Supervision Consultant (SC) will review the complaint and direct the contractor for necessary action. In case of no satisfactory action, the complainant can approach Agstafa local court.

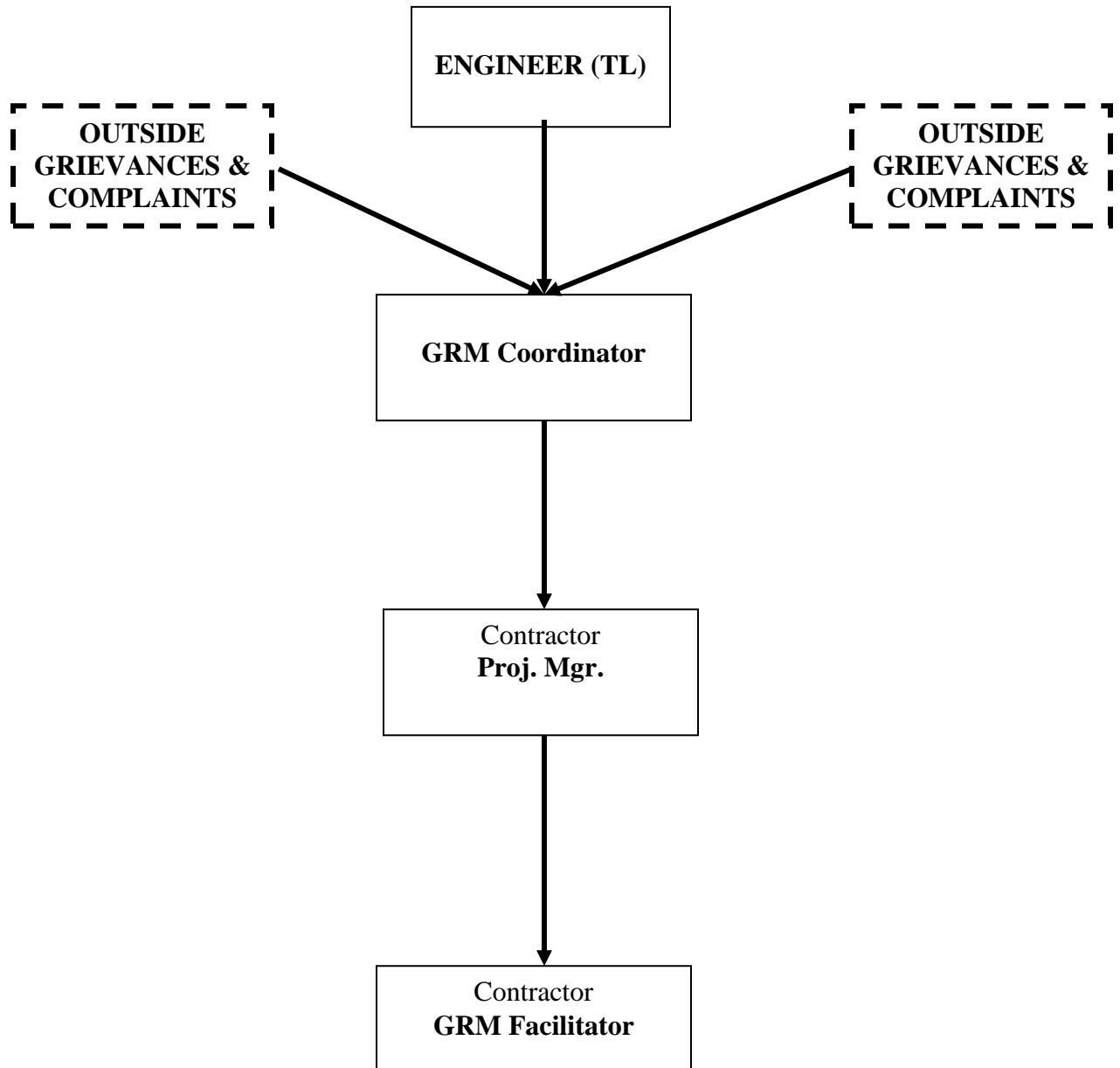
### 2.1 Administrative Structure and Key Functionaries

156. The Grievance Redress Mechanism will be a means in order for the ARS-PIU to be aware of and respond to stakeholders' concerns related to the project in a timely manner. The GRM process, or procedure will be established to receive and facilitate resolution of stakeholders' concerns and grievances about the client's environmental and social performance. Based on the guidelines of a number of funding institutions including ADB, the GRM can be designed to meet the needs of the project as well as conform to existing local guidelines. The composition of the GM procedure consists of the following:
  - **Engineer-Team Leader** – as the Client Representative, will oversee the resolution process of the GRM and ensures that the coordination procedures are working at optimum level. He shall have the overall responsibility over the resolution process of the GRM.

- **GRM Coordinator – Engineer’s Staff** – will be the chief implementer of the GRM and initiates coordination with the other designated contact GRM members of the Contractor and those at the outside. In addition, the GRM Coordinator shall have the following functions, tasks and responsibilities:
  - Ensure that all complaints or grievance are registered.
  - Analyze the complaint or grievance with the Engineer’s staff and come up with initial assessment with recommended action to the Team Leader.
  - Spearheads the gathering of accurate information regarding the complaint which includes documentary and site verification, as well as cross-examination with primary (from survey) and secondary information.
  - Update and advice the complainant on the progress of the complaints for appropriate follow-up actions.
  - Recommends the appropriate approach and strategy for the resolution of issues.
  - Coordinates with Contractor’s GRM Facilitators on the appropriate action needed for the resolution of issues.
  - Documents the progress of the complaints until final acceptance of the solution or measures by the complainant
  - In case of non-resolution of issue, conduct an in-depth review process and formulate alternative approach and strategy
  - Coordinates communication with outside local, regional offices and/or and entities that has jurisdictional responsibility over the issue or area and conduct follow-through tasks on the progress of the complaints.
- **Contractor – Project Managers** – as the Contractor’s Representative shall ensure that the agreed measures appropriate to the complaints be performed in the most practical and expedient manner.
- **GRM Facilitator – Contractor’s Staff** – actively coordinates and follows through the Contractor’s performance of the measures and reports the progress of such measures to the GRM Coordinator. Assists the GRM Coordinator in gathering accurate information relevant to the complaint.

157. The coordination arrangement chart is shown below

**Figure 12: Grievance Redress Mechanism Coordination Arrangement**



### Dispute Resolution Process

158. During the actual operationalization of the Grievance Redress Mechanism, the process and communication flows will be centered with GRM Coordinator. The GRM Coordinator will take initiative to be observant of any issue and will try to obtain information which will be used at the subsequent GRM process stages. These information can become valuable inputs to resolution of issues and to avoid any conflicts that can further complicate situations.
159. In a normal processing of GRM the complaints undergoes four (4) major procedural stages with intervening activities as follows:

**Stage I: REGISTRATION AND INITIAL ASSESSMENT:** This is the entry point of complaint wherein the complainant is allowed to tell his side of the issue and to be assured that his grievance will be seriously and expeditiously dealt with. The following are the tasks in this stage.

- **Receive Grievance** – This task will entail listening intently from the source of the complaint, filling out the **Complaint Form** (sample in Annex 1) and registering in a **GRM Registry Book** (sample in Annex 2) and assigning a **GRM Reference Number**. The complainant or representative shall affix a signature and provide contact particulars on the Complaint Form. Important information shall be entered in the Complaint Form which can be supplemented by additional documents.
- **Obtain Comprehensive Information** – At this task the GRM Coordinator will mobilize some staff from the Engineer's organization or ask assistance from the Contractor's GRM Facilitator to obtain as much information as possible from the location where the complaint originated, the impact area and the outlying areas. Field information will be gathered using necessary survey methodologies, equipment and devices. Interviews shall be conducted directly from the field to have the actual appreciation of the nature of the complaint and to obtain other versions of the issue. It would be necessary to talk and discuss with as much people as possible who have direct and indirect knowledge on the problem. Photographs and videos shall be obtained which can be used later in the analysis of the problem. Secondary backup information shall also be acquired to determine some background information and cross-reference them with other sources of information.
- **Screen and Assess** – After gathering all the available and obtainable information, the GRM Coordinator with the support of the Engineer's staff shall analyze the complaint and verify what can be admissible information. The team will render opinion whether the complaint is project related or not and provide justifications for such opinion. The findings shall be communicated for the complainant upon which in case of disagreement, supplementary information may have to be provided by the complainant.

**Stage II: INITIAL RESOLUTION:** Based on the opinions of the screening and upon presentation of additional documentary evidences by the complainant, the Engineer will instruct the GRM Coordinator to direct the complaint to one of the following options:

- **Refer to Appropriate Venue/s** – If the issue is not relevant to the project, the GRM Coordinator will refer the issue to appropriate competent office and explain to the

complainant the reasons. He will advise the complainant on what to do and provide contact particulars to that appropriate office if available. Also if available and possible he can refer the complainant to some people who can really be of good help. After this steps, the matter will be considered closed and Resolution Acceptance Form will be issued for the acceptance and signature of the complainant. Relevant information regarding the resolved complaint shall be gathered and a cross entry shall be entered in the GRM Registry Book.

- **Resolve Locally** – If found to be project related, the Engineer will give a directive to the Contractor/s to resolve the matter. It would be necessary to have a meeting with the Contractor/s' project manager regarding the issue. The meeting will entail determination of the most preferred options, which will be part of the next stage (Stage III) of GRM process.
- **Reject the Complaint with Clear Explanation** – When in the opinion of the Engineer and the GRM Coordinator that the complaint is not project-related, it is rejected and such decision will be communicated to the complainant. After which the matter will be considered closed and all relevant information shall form part of the archived information.

**Stage III: SELECTION OF APPROACH AND STRATEGY:** At this stage the Engineer and the Contractor/s will agree to accept the complaint and to locally resolve it; and henceforth shall decide on the proper approach and strategy for its resolutions. Depending on the gravity of the situation and of the complaint the GRM has the following options:

- **Engineer/ Contractor/s Recommend Solution** – In this approach, as in most cases, the Engineer and the Contractor shall decide on the technical solution to the issue and implement the measure/s. This seems straightforward especially if this is within the scope and obligations of the Contract. Some contractual issues may arise pertaining to the cost and payment considerations but this can be decided by the Contractor and the Engineer. After due decision is made on the division of scope and responsibility, the GRM Coordinator will oversee the implementation of the resolution or measures and report to the Engineer. The progress of the execution of works is documented with periodic coordinative reporting to the Engineer. The complainant is also appraised on the progress of the work for better attainment of results for improved effectiveness of the measures
- **Complainant Joint Solution** – In some cases, the cooperation and collaborative effort of the complainant is necessary since he/she may be able to provide some avenues to facilitate the devising of the schemed solution. In some instances, economy can be affected and with greater satisfaction to the complainant if his opinion is sought. Although the ultimate decision will be with the Engineer, it will be a good option if the complainant is brought into the problem solving process.
- **Third Party Arbitration** – In complicated matters where the complainant does not agree that working with the Engineer and Contractor will not be perceived as balanced and fair, the complaint can be elevated for arbitration. This may not be an easy approach as the project will have to organize and set up an arbitrating party, perceived as impartial, to execute the process. Nevertheless, this can still be pursued if both the Engineer-Contractor and the complainant agree to use this approach.
- **Local Conflict Resolution** – The rayon, particularly in Gazakh District, has a number of ways where local conflict resolutions venues exist. These are through the local courts,

council of elders in the village, through the appointed head of local municipality. In these venues, the issues are discussed and with the participation of the Engineer, consensus can be arrived at for the benefit of those affected directly and indirectly by the issue.

**Stage IV: EXECUTION OF MEASURES AND DOCUMENTATION:** At this stage, the agreed solution or measures are implemented by the Contractor under the supervision of the Engineer and tracked down by the GRM Coordinator for documentary purposes.

- **Execute Solution** – The execution of solution will entail engagement of the Contractor and his staff. Designs or schemes will be agreed upon and to be checked by the staff of the Engineer as part of their facilitation tasks. Equipment and materials will be employed and work will be performed by the Contractor and supervised by the Engineer's staff.
- **Document the Progress** – The GRM Coordinator will undertake full documentation of the work and shall form part of the **Measures Implementation Form**, and shall also include designs and schemes, costings, photographs of the work (before, during and after) which will form part of the progress reporting and documentation archive of the GRM.

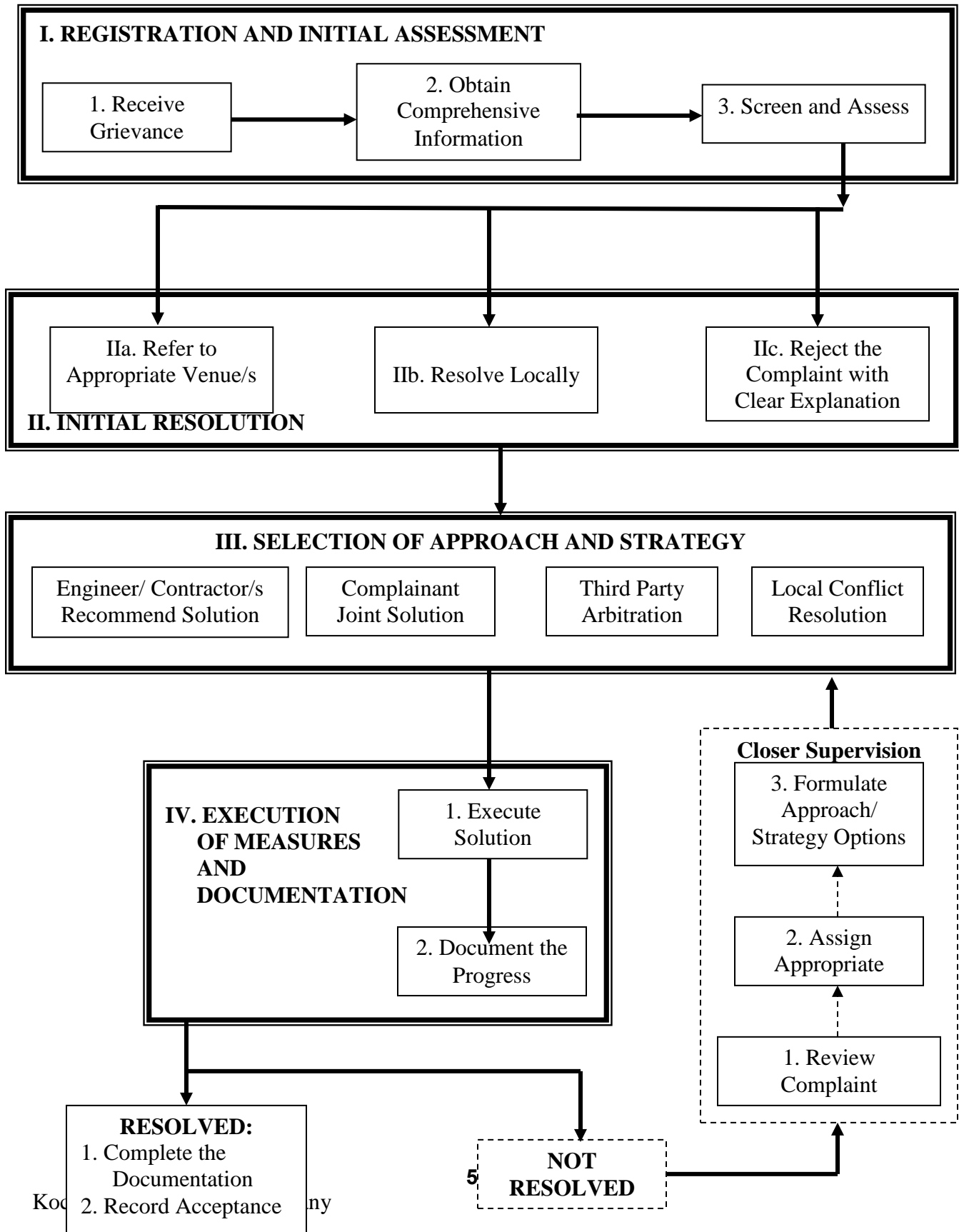
160. Finally, two things can occur at the end – the complainant is satisfied or the complainant is not satisfied; and hence the issue persists. These two pathways are presented here:

- If the issue is deemed satisfactory the grievance is considered **RESOLVED** and hence two more tasks are remaining:
  1. **Complete the Documentation** – The GRM Coordinator will complete all documentations in reference to the **Measures Implementation Form** and ask the complainant to sign the **Resolution Acceptance Form** that he/she was satisfied with the measures implemented.
  2. **Record Acceptance** – In the end, the GRM Coordinator will put an entry in the GRM Registry Book that the grievance is resolved.
- In case the issue is **Not Resolved**, the complaint and grievance will follow another pathway entailing the following sub-tasks and then gets back to Stage III to repeat the process:
  1. **Review Complaint** – The GRM Coordinator will initiate a review and if necessary request the Engineer to convene a group for larger review. The purpose of this is to determine other underlying issues that caused that non-resolution of the complaint.
  2. **Assign Appropriate Staff** – It may be necessary that appropriate staff will have to assist in the process or even outside assistance from some governmental offices may be necessary. The GRM Coordinator will seek out other staff who can be contributive to the resolution of the issue
  3. **Formulate Approach/ Strategy Options** – The GRM should also determine if the approach itself was the cause of the non-resolution of the issues. In this instance, he/she will ask the Engineer to revisit the initial approach and further refine it or even change it entirely when necessary.

161. During this internal sub-process, the GRM Coordinator should be proactive in documenting every step which will form part of the documentary work and progress

monitoring of the GRM process. The entire GRM Process Flowchart is summarized in a diagram below.

**Figure 13: Grievance Redress Mechanism (GRM) Process Flowchart**





## ENVIRONMENTAL MANAGEMENT PLAN

162. Environmental Management Plans for each of the four (4) bridges, consisting of impact mitigation and monitoring plan, are prepared as part of this IEE. The EMPs are designed to follow the general template established during the preparation of the candidate subprojects, but adapted to the specific requirements of the subproject in question. The EMPs will be updated and expanded for each bridge individually and will be attached to the tender documents (particular conditions of contract). As part of the environmental management, the procedures for: workers' health and safety; public safety and reduce inconvenience and disposal of construction wastes, etc. are developed.
163. A program of monitoring will be required to ensure that all concerned agencies take the specified action to provide the required mitigation, to assess whether the action has adequately protected the environment, and to determine whether any additional measures may be necessary. Regular monitoring of implementation measures by Civil Contractors will be conducted by the Construction Supervision Consultant, and overseen by AzerRoadService. Monitoring during operation stage will also be conducted by AzerRoadService.
164. During construction, most of the mitigation measures are fairly standard methods of minimizing disturbance from building in populated areas (maintaining access, planning work to minimize public inconvenience and traffic disruptions, finding uses for waste material, etc). Monitoring of such measures normally involves making observations in the course of site visits, although some require more formal checking of records and other aspects. During the construction, the air quality and noise must remain below specified concentrations and levels. The monitoring of ambient air quality and noise levels during construction is the responsibility of Contractor. The Supervision Consultant will supervise and monitor the contractor's performance during the construction.
165. The following Tables 1 -4 show Environmental Management Plans respectively for various stages – preconstruction, construction and operation. These show mitigation activities, methods, project agencies responsible for implementation and monitoring of mitigation measures. The following Table 5 shows the proposed General Environmental Monitoring Plan for 4 Bridges Improvement Project, which specifies various monitoring activities to be conducted. It describes: (i) mitigation measures, (ii) location, (iii) measurement method, (iv) frequency of monitoring and (v) responsibility for monitoring.
166. A summary of the Environmental Assessment and Review Procedures and respective responsibilities are summarized in Table 5. The Program will be implemented by AzerRoadsService Program Implementation Unit (PIU) and the agency responsible for operation of improved infrastructure will be AzerRoadService Joint Stock Company. The PIU will provide guidance on environmental issues, and will be the first level of internal monitoring. ARS has a significant experience in implementing donor-funded projects, and the necessary technical expertise in monitoring environmental management plans.

## Environmental Management Plan

<b>Table 1: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Air Quality</b>	Air quality impacts from stationary sources	Locations for quarry sites, borrow pits and asphalt plants shall require approval from the Engineer and National & Regional Authorities (NRA) during the Pre-construction phase. Efforts should be made to ensure that these facilities are as near to the Project road as practical to avoid unnecessary trips and potential dust issues from vehicle movements during construction works. In addition, no quarry, borrow pit or asphalt plant shall be located within 300 meters of any urban area, protected area or sensitive receptor.	<ul style="list-style-type: none"> <li>• Contractor to select sites</li> <li>• Engineer and NRAs to approve sites.</li> </ul>
<b>Topography</b>	Selection of Quarry Sites	<p>Several potential quarry sites have been identified by AzerRoadService (ARS), although they do not currently have permits. These quarry sites must obtain the required permits prior to commencement of works at these sites. This shall include approval from the NRA and the Engineer. Efforts should be made to ensure that quarries are as near to the site as practical to avoid unnecessary journeys. However, no quarry shall be located within one kilometer of any urban area, protected area or sensitive receptor. The locations of the quarries shall be indicated within the Contractors SSEMP. In addition, Contractors should ensure that quarries and crusher plants are:</p> <ul style="list-style-type: none"> <li>- Located at least 300 meters from residential areas to prevent noise and dust impacts;</li> <li>- Located outside of agricultural land; and</li> <li>- Where possible located on government owned lands.</li> </ul> <p>In addition, alluvial material which will be excavated upstream from blocked culvert areas may be used as base material. This material shall be tested by the Contractor and Engineer for its suitability as base material before it maybe used. A quarry site reinstatement plan should be presented to the Engineer prior to operating quarry sites. Such plan should be implemented prior to the end of the project</p>	<ul style="list-style-type: none"> <li>• Contractor to select quarry sites and apply for approval from NRAs and any other regulatory agencies.</li> <li>• Engineer to review quarry locations, licenses and approvals from ARS and NRA.</li> <li>• Engineer to test suitability of alluvial material.</li> <li>• Engineer to verify and approve the quarry site reinstatement plan</li> </ul>
<b>Hydrology /</b>	Selection of	Due to the sensitivity of the borrow pit locations, the Contractor shall	<ul style="list-style-type: none"> <li>• Contractor to select borrow</li> </ul>

<b>Table 1: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Soils</b>	Borrow Pits	prepare a Borrow Pit Action Plan (BAP) that should be submitted as part of the SSEMP to the Engineer prior to the start of construction. The plan will identify the locations of all proposed borrow pits. The locations of the borrow pits shall be approved by, the Engineer and ARS, and the NRAs. No borrow pit shall be located within five hundred meters of any protected area. The locations of the borrow pits shall be indicated within the Contractors SSEMP.	<p>sites and apply for approval from NRAs and any other regulatory agencies.</p> <ul style="list-style-type: none"> <li>• Engineer to review borrow locations, licenses and approvals from ARS and NRA.</li> <li>• Engineer to verify and approve the borrow pit reinstatement plan</li> </ul>
	Selection of Asphalt Plant Location	No new asphalt plant shall be located within five hundred meters of any urban area, protected area or sensitive receptor. The locations of the asphalt plants shall be indicated within the Contractors SSEMP. Asphalt plant locations shall be approved by the Engineer, ARS and the NRA.	<ul style="list-style-type: none"> <li>• Contractor to select sites and apply for approval from NRAs and any other regulatory agencies.</li> <li>• Engineer to review locations, licenses and approvals from ARS and NRA.</li> </ul>
	Selection of Construction Camp Site	<p>The Contractor shall be responsible for the preparation of a Construction Camp Site Plan which will form part of the SSEMP. The Plan shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. The Contractor shall ensure the following conditions are met within the Plan:</p> <ul style="list-style-type: none"> <li>• Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.</li> <li>• There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited.</li> <li>• Liquid material storage containment areas shall not drain directly to surface water.</li> <li>• Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.</li> </ul>	<ul style="list-style-type: none"> <li>• Engineer to review &amp; approve Site Plan</li> </ul>

<b>Table 1: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<ul style="list-style-type: none"> <li>• Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters.</li> <li>• Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.</li> <li>• Spill clean up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage: <ul style="list-style-type: none"> <li>- Fueling operations shall occur only within containment areas.</li> <li>- All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>- Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.</li> <li>- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.</li> <li>- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.</li> <li>- Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized for hazardous waste.</li> </ul> </li> </ul> <p>Site plans shall be devised to ensure that, insofar as possible, all temporary construction facilities are located at least 50 meters away from a water course, stream, or canal. If determined warranted by the Engineer, the</p>	

<b>Table 1: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor shall ensure that all vehicle are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.	
<b>Soils</b>	Contamination of Soils	The Contractor will be responsible for preparation of an Emergency Response Plan (ERP), which will cover containment of hazardous materials, oil spills, and work-site accidents. The plan will detail the process for handling, and subsequently reporting, emergencies, and specify the organizational structure (including responsibilities of nominated personnel). The plan will be submitted to the Engineer for approval as part of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to prepare ERP</li> <li>• Engineer to review and approve ERP as part of the SSEMP</li> </ul>
<b>Air Quality</b>	Air Quality	The Contractor shall be responsible for the preparation of an Air Quality Plan (AQP), submitted to the Engineer prior to commencement of the works. The plan will detail the action to be taken to minimize dust generation (e.g. spraying unsurfaced roads with water, covering stock-piles, and blasting with use of small charges (when needed), etc) and will identify the type, age and standard of equipment to be used. The Plan shall also include contingencies for the accidental release of toxic air pollutants. The Plan shall be completed during the design phase and shall form part of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to prepare AQP</li> <li>• Engineer to review and approve ERP as part of the SSEMP</li> </ul>
<b>Flora</b>	Vegetation procurement	The Contractor shall be responsible for identifying locations where he may procure specific vegetation for slope stabilization. The vegetation types should include; Elm - Celtis caucasica, Judas-tree, certis – Certis, Senna-Colutea vulgaris & Dog rose - Rosa cocanika. Embankment for bridge approaches should be stabilized as per design and with the use of native grasses and vegetation in conformance with the design.	<ul style="list-style-type: none"> <li>• Contractor to select sites.</li> </ul>
<b>Land Use</b>	Loss of Property and Land	In such circumstances necessary, the ARS must prepare the Land Acquisition and Resettlement Plan (the LARP), obtain the approval of ADB and then implement the plan and acquire the land prior to the start of Pre-construction activities.	<ul style="list-style-type: none"> <li>• ARS to complete LARP (when necessary)</li> <li>• ADB to approve LARP (when necessary)</li> </ul>

<b>Table 1: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Waste and Spoil</b>	Waste Management	<p>The Contractor shall be responsible for preparing a Waste Management Plan (WMP) to manage all excess spoil and waste material. The Plan, which forms part of the SSEMP, shall include items relating to the safe handling and management of:</p> <ul style="list-style-type: none"> <li>• Domestic waste</li> <li>• Food waste</li> <li>• Inert garbage</li> <li>• Recycled Waste</li> <li>• Plastic</li> <li>• Metals</li> <li>• Wood</li> <li>• Construction Waste</li> <li>• Hazardous Waste</li> <li>• Liquid Waste</li> </ul> <p>The Plan will also include provisions to manage all excess spoil material. The Plan should indicate where the spoil will occur and methods and locations for disposal.</p>	<ul style="list-style-type: none"> <li>• Contractor to prepare WMP</li> <li>• Engineer to review and approve WMP as part of the SSEMP</li> </ul>
<b>Health and safety</b>	Worker Health and Safety	A Health and Safety Plan (HSP) shall be prepared by the Contractor, as part of the SSEMP, to manage worker safety. The plan shall include an item relating to accidental release of toxic fumes.	<ul style="list-style-type: none"> <li>• Contractor to prepare HSP</li> <li>• Engineer to review and approve HSP as part of the SSEMP</li> </ul>
<b>EMP Requirement</b>	Preparation of SSEMP	<p>The Contractor shall prepare a SSEMP to meet the requirements of this EMP. Specifically the SSEMP shall contain sections relating to:</p> <ul style="list-style-type: none"> <li>• Management of Physical Environment <ul style="list-style-type: none"> <li>- Soils</li> <li>- Water</li> <li>- Air</li> </ul> </li> <li>• Management of Ecological Environmental <ul style="list-style-type: none"> <li>- Flora</li> <li>- Fauna</li> <li>- Protected Areas</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to prepare SSEMP</li> <li>• Engineer to review and approve SSEMP</li> </ul>

<b>Table 1: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<ul style="list-style-type: none"> <li>• Management of Economic Characteristics <ul style="list-style-type: none"> <li>- Infrastructure</li> <li>- Transport</li> <li>- Land Use</li> <li>- Agriculture</li> </ul> </li> <li>• Management of Social and Cultural Resources <ul style="list-style-type: none"> <li>- Communities, Health and Education Facilities</li> <li>- Historical and Cultural Areas</li> <li>- Noise</li> </ul> </li> </ul> <p>In addition, the SSEMP shall contain specific Management Plans as Annexes relating to the following:</p> <ul style="list-style-type: none"> <li>• Borrow Pit Management Plan</li> <li>• Air Quality Management Plan</li> <li>• Water Quality Management Plan</li> <li>• Noise Management Plan</li> <li>• Waste Management Plan</li> <li>• Emergency Response Plan</li> <li>• Dust Suppression Plan</li> <li>• Site Plan</li> <li>• Health and Safety Plan</li> </ul> <p>Each section shall describe the precise location of the required mitigation / monitoring, the persons responsible for the mitigation / monitoring, the schedule and reporting methodology. The SSEMP must be submitted within 30 days of the contract award and construction cannot commence until the SSEMPs are approved by the ARS and the Engineer.</p>	
	Incorporation of Items into Bid Documents	The Contractor shall be responsible for ensuring compliance with this EMP. A specific environmental section shall be included within the main Bid Documents indicating that the Contractor shall be responsible for conforming to the requirements of the EMP. As such this EMP shall be included as an annex to the Contract Bid Documents.	<ul style="list-style-type: none"> <li>• ARS to ensure EMP is included within Bid Documents</li> </ul>

<b>Table 2: EMP Detailed Design Phase Mitigation</b>			
	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Soils</b>	Soil Erosion	<ul style="list-style-type: none"> <li>• To reduce the impacts of erosion, the Contractors Detailed Designs shall ensure:</li> <li>• The side slopes of embankments will be designed to reflect soil strength and other considerations as included in the project specifications in order to reduce slips or erosion;</li> <li>• For embankments greater than 6m, stepped embankments will be used;</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to include mitigations in his detailed design.</li> <li>• Engineer to review and approve design documents.</li> </ul>
<b>Geology and Seismic Conditions</b>	Seismic Issues	The seismic characteristics of the potentially affected area shall be taken into account during the Detailed Design phase of the Project. Earthquake loading shall be applied to the design of structures, including bridges, to ensure that seismic events do not have negative impacts during the operational phase of the Project.	<ul style="list-style-type: none"> <li>• Contractor to include mitigations in his detailed design.</li> <li>• Engineer to review and approve design documents.</li> </ul>
<b>Hydrology</b>	Drainage	Consideration in the design phase will be given to the issue of drainage and culverts to ensure that drainage patterns are improved from the existing conditions and that increased run-off does not occur or result in flooding of areas previously undisturbed. During design, the Contractor shall ensure that all drainage works are designed based on the historical flood data and flood forecasting. A design discharge of 50 years return period is considered for culverts, and 100 years of bridges. The design of all structural components must conform to the design standards provided in the Employer's Special Requirements.	<ul style="list-style-type: none"> <li>• Engineer to review and approve design documents.</li> </ul>
	Drilling of Boreholes	The Contractor shall ensure that all required permits have been gathered prior to the excavation of any borehole.	<ul style="list-style-type: none"> <li>• Contractor to gather permits</li> <li>• Engineer to review permits prior to excavation works commencement.</li> </ul>
	Bridge Construction	All new and widened bridges must be designed for the life expectancy of 75 years. The bridge rehabilitation and strengthening works must be designed for the life expectancy of 50 years. The design loading and design of all structural components must conform to the bridge design standards provided in the Employer's Special Requirements. Finally, the bridge design and layout must be aesthetically pleasing and in harmony with the existing environment.	<ul style="list-style-type: none"> <li>• Engineer to review and approve design documents.</li> </ul>



<b>Table 1: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Historical and Archaeological Sites</b>	Impacts to Historical and Archaeological Sites	Designs shall ensure that there is no significant encroachment to any historical or archaeological site eventually discovered during Detailed Design.	<ul style="list-style-type: none"> <li>• Contractor to include mitigations in his detailed design.</li> <li>• Engineer to review and approve design documents.</li> </ul>
<b>Flora</b>	Loss of Trees	During Detailed Design the Contractor shall ensure that roadside activities such as asphalt plants, construction camps and other ancillary features are properly sited as agreed with the relevant CEP. The Contractor should avoid loss of trees where possible and should employ techniques such as asymmetrical widening. Where trees must be felled, the Contractor shall ensure that each one removed should be replaced by at least two new saplings of the same species or other at suitable locations, all as designated by the tree owner,	<ul style="list-style-type: none"> <li>• Contractor to include mitigations in his detailed design.</li> <li>• Engineer to review and approve design documents.</li> <li>• Contractor to replace trees during Construction with oversight from the Engineer.</li> </ul>
<b>Health and Safety</b>	Safety	The Contractor shall ensure that traffic safety issues shall be accounted for during the design phase of the Project, they including incorporation of: <ul style="list-style-type: none"> <li>• Safety barriers</li> <li>• Traffic signs</li> <li>• Road Crossings</li> <li>• Speed Bumps</li> <li>• Speed limits</li> </ul>	<ul style="list-style-type: none"> <li>• Engineer to review and approve design documents.</li> </ul>

<b>Table 3: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Air Quality</b>	Open burning of waste materials	The Contractor shall ensure no burning of debris or other materials will occur on the Site without permission of the Engineer.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Engineer to routinely monitor Contractors</li> </ul>

<b>Table 3: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
			activities.
	Fuel Emissions	Contractor shall ensure that no furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the Engineer.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Exhaust emissions from the operation of construction machinery	<p>The Contractor shall ensure construction equipment shall be maintained to a good standard and fitted with pollution control devices. The equipment (including the pollution control devices) will be checked at regular intervals by the Engineer to ensure they are maintained in working order and the inspection result will be recorded by the Contractor &amp; Engineer as part of environmental monitoring. In addition, the Contractor shall:</p> <ul style="list-style-type: none"> <li>• Discourage of the idling of engines;</li> <li>• Prohibit of the use of equipment and machinery that causes excessive pollution (i.e. visible smoke) at project work sites;</li> </ul> <p>Ensure material stockpiles being located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne.</p>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Fugitive emissions from quarries and asphalt plants.	The Contractor shall ensure that conveyor belts at ancillary facilities (e.g. quarries) shall be fitted with wind-boards, and conveyor transfer points and hopper discharge areas shall be enclosed to minimize dust emission. All conveyors carrying materials that have the potential to create dust shall be totally enclosed and fitted with belt cleaners.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
	Dust generated from haul roads, unpaved roads, exposed soils and material stock piles.	<p>The Contractor shall ensure that the following dust suppression measures shall be instituted:</p> <ul style="list-style-type: none"> <li>• All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s);</li> <li>• Areas of reclamation shall be completed, including final compaction, as quickly as possible consistent with good practice to limit the creation of wind blown dust.</li> <li>• Hard surfaces will be required in areas with regular movements of vehicles; and</li> <li>• Effective use of water sprays will be implemented (e.g., all roads within the construction areas of the Site shall be sprayed at least twice each day, and more if necessary to control dust to the satisfaction of the Engineer).</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Topography</b>	Cut and Fill Requirement	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>• Temporary and permanent storage of materials should be confined to government owned land and in no circumstances should be dumped on agricultural or productive lands or to any watercourse including irrigation channels.</li> <li>• In the event of any spoil or debris from construction works being deposited in any of the afore mentioned areas or any silt washed down to any area, then all such spoil, debris or material and silt shall be immediately removed and the affected land and areas restored to their natural state by the Contractor to the satisfaction of the Engineer.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> <li>• Approvals for waste disposal sites to be sought from the NRA by the Contractor.</li> </ul>
	Slope Stabilization	<p>The Contractor shall be responsible for the following:</p> <ul style="list-style-type: none"> <li>• Final forming and re-vegetation will be completed by the Contractor as soon as possible following fill placement to facilitate regeneration of a stabilizing ground cover.</li> <li>• Trenching will be used where necessary to ensure successful establishment of vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<ul style="list-style-type: none"> <li>Seeding with a fast growing crop and native seed mix (see <b>Specifications for list of species</b>) will occur immediately after fill placement to prevent scour and to encourage stabilization;</li> <li>Construction in erosion and flood-prone areas will be restricted to the dry season.</li> </ul>	
	Quarries	<p>If licensed quarries are not available the Contractor may be made responsible for setting up their dedicated quarries. Prior to opening of any quarry or rock crushing facility, the Contractor will require approval from the relevant NRA and the Engineer to ensure that land owners are adequately compensated for land use and that the sites are not located in an area likely to cause significant detriment to the local environment. To ensure that this is the case Contractors should ensure that quarries and crusher plants are:</p> <ul style="list-style-type: none"> <li>Located at least 300 meters from urban areas to prevent noise and dust impacts;</li> <li>Located outside of agricultural land; and</li> <li>Where possible located on government owned lands.</li> <li>Quarry area should be reinstated prior to the completion of the project.</li> </ul>	<ul style="list-style-type: none"> <li>NRA to approve locations.</li> <li>Contractor to obtain necessary permits.</li> <li>Engineer to review permits and approvals prior to the opening of the site.</li> <li>Engineer to inspect the reinstatement work on the quarry area by the Contractor</li> </ul>
		<p>Alluvial material which will be excavated upstream from blocked culvert areas may be used as base material. This material shall be tested by the Contractor and Engineer for its suitability as base material before it maybe used. The Contractor must use such material first before using any other quarry or borrow pit within 3 km from any such alluvial deposit.</p>	<ul style="list-style-type: none"> <li>Engineer to test material before use as base material.</li> </ul>
	Borrow Pits.	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>Pit restoration will follow the completion of works in full compliance all applicable standards and specifications.</li> <li>Arrangements for opening and using material borrow pits will contain enforceable provisions.</li> <li>The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Engineer will be required before final acceptance and payment under the terms of contracts.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> <li>Engineer to inspect the reinstatement work on the borrow pit by the Contractor</li> </ul>

<b>Table 3: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<ul style="list-style-type: none"> <li>Additional borrow pits will not be opened without the restoration of those areas no longer in use.</li> <li>Borrow pits should be reinstated prior to completion of the Project</li> </ul>	
<b>Soils</b>	Loss of Land for Agricultural Production	The Engineer shall ensure that all appropriate LARP measures have been taken by the ARS before any alteration or destruction of agricultural land by the Contractor.	<ul style="list-style-type: none"> <li>Engineer to coordinate with ARS &amp; Contractor.</li> </ul>
	Erosion	<p>The Contractor will be responsible for ensuring:</p> <ul style="list-style-type: none"> <li>Material that is less susceptible to erosion will be selected for placement around bridges and culverts.</li> <li>Re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local flora (see <b>Specifications</b>); (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth, although due to the arid conditions in most of the road, this may only be feasible where there is regular rainfall or other natural water supply.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
	Contamination due to Spills or Hazardous Materials	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>The construction camp maintenance yard shall be constructed on impervious Layer with adequate drainage to collect spills, there shall be no vehicle maintenance activities on open ground.</li> <li>Filling and refueling shall be strictly controlled and subject to formal procedures. Drip pans shall be placed under all filling and fueling areas. Waste oils shall be stored and disposed of by a licensed contractor.</li> <li>All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>The contents of any tank or drum shall be clearly marked. Measures shall</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		be taken to ensure that no contaminated discharges enter any soils. <ul style="list-style-type: none"> <li>• No bitumen drums or containers, full or used, shall be stored on open ground. They shall only be stored on impervious Layer.</li> <li>• Areas using bitumen shall be constructed on impervious Layer to prevent seepage of oils into the soils.</li> </ul>	
<b>Hydrology</b>	Drainage and Flooding	The Contractor shall ensure the following conditions are met: <ul style="list-style-type: none"> <li>• During the construction phase the Contractor is required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works.</li> <li>• The Contractor shall arrange with the village representatives those works which might interfere with the flow of irrigation waters to be carried out at such times as will cause the least disturbance to irrigation operations.</li> <li>• Should any operation being performed by the Contractor interrupt existing irrigation facilities, the Contractor shall restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Construction Camps and Storage Areas	The Contractor shall ensure the following conditions are met: <ul style="list-style-type: none"> <li>• Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.</li> <li>• There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited.</li> <li>• Liquid material storage containment areas shall not drain directly to surface water.</li> <li>• Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.</li> <li>• Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<ul style="list-style-type: none"> <li>• Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.</li> <li>• Spill clean up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage: <ul style="list-style-type: none"> <li>- Fueling operations shall occur only within containment areas.</li> <li>- All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>- Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.</li> <li>- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.</li> <li>- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.</li> <li>- Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized for hazardous waste.</li> </ul> </li> <li>• If determined warranted by the Engineer, the Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor shall ensure that all vehicle are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning</li> </ul>	

<b>Table 3: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.	
	Bridge Construction	<p>The Contractor shall consult with the local NRA to establish the fish spawning period in relation to the bridge construction works. The Contractor shall ensure that all works are undertaken in periods least likely to affect the fish spawning period. In addition, concerning bridge construction works, the Contractor shall:</p> <ul style="list-style-type: none"> <li>• Divert the water flow near the bridge piers.</li> <li>• Cofferdams, silt fences, sediment barriers or other devices will be provided to prevent migration of silt during construction within streams.</li> <li>• Dewatering and cleaning of cofferdams will be performed to prevent siltation by pumping from cofferdams to a settling basin or a containment unit.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Contractor to consult with NRA.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Flora and Fauna</b>	Loss of flora	<p>The Contractor shall ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Each tree removed by the Contractor should be replaced by at least two new saplings of the same species or other at suitable locations, all as designated by the tree owner.</li> <li>• Supplying appropriate and adequate fuel in workers' camps to prevent fuel-wood collection from unauthorized sources.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Protected Areas	The opening of additional borrow pits shall require the Contractor to receive the approval of the Environmental Agency and the Engineer to ensure there are no detrimental impacts to protected areas.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Land Use</b>	Construction Camps and other ancillary facilities	The Contractor will be required to coordinate all construction camp activities with neighbouring land uses. The Contractor shall also be responsible to maintain and cleanup campsites and respect the rights of local landowners. If located outside the RoW, written agreements with local landowners for temporary use of the property will be required and sites must be restored to a level acceptable to the owner within predetermined time period.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Transport and</b>	Road	The Contractor shall ensure that:	<ul style="list-style-type: none"> <li>• Contractor to implement</li> </ul>



<b>Table 3: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Infrastructure</b>	closures, existing bridge closure, diversions and blocking of access routes	<ul style="list-style-type: none"> <li>• He shall be responsible for provision of all road diversion signs and ensure that diversion roads do not impact negatively upon private lands.</li> <li>• Any diversions shall be agreed upon by the Engineer.</li> <li>• Notices of delays, due to blasting (if any), shall be posted in villages within ten kilometers of the blasting area so villagers can plan their travel times accordingly.</li> <li>• The Contractor should make blasting at a regular period in the day so that the population in the valley becomes aware of the most likely delay periods.</li> <li>• The Contractor shall be responsible for ensuring that all access routes are kept open during Project works for at least 50% of the day during construction works and 100% of the time after construction works are completed for the day. Any temporary existing bridge closure should be communicated to affected people ahead of time</li> </ul>	<ul style="list-style-type: none"> <li>• mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> <li>• Contractor to provide plan for any existing bridge closure</li> </ul>
	Electrical Systems	During construction the Contractor shall ensure that all power lines be kept operational, this may include the provision of temporary transmission lines while existing poles and lines are moved. The only exception to this item will be during periods of blasting when HV power lines will be switched off for safety.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Waste and Spoil</b>	Spoil	Under no circumstances shall the Contractor dump excess materials on private lands without permission of the owner and approval from the Engineer. In addition, excess spoil shall not be dumped or pushed into rivers at any location unless in low volumes and agreed upon with the Engineer and with approval from the NRA.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• NRA to approve any waste disposal to the River.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Inert Solid & Liquid waste	<p>The contractor shall be responsible for the following:</p> <ul style="list-style-type: none"> <li>• Provide refuse containers at each worksite;</li> <li>• Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• NRA to approve any waste disposal site.</li> </ul>

<b>Table 3: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<p>wastes before transportation and final disposal;</p> <ul style="list-style-type: none"> <li>• Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process, and</li> <li>• Collect and transport non-hazardous wastes to all approved disposal sites. The sites for waste disposal shall be agreed with the local municipal authorities and NRA. A specialized company may be contracted, if available to ensure collection of domestic and general waste from camps and temporary storage areas and transportation to landfills approved and licensed by the NRA.</li> </ul>	<ul style="list-style-type: none"> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Asphalt	It is recommended that discussions are undertaken with ARS to determine if it is feasible to re-process the asphalt for use on other local roads throughout the region. If it is determined to be cost effective, the Project should consider procuring equipment for this purpose.	<ul style="list-style-type: none"> <li>• ARS to assess feasibility.</li> </ul>
	Hazardous Waste	Management, handling & storage protocols for hazardous waste will be outlined in the Contractors Waste Management Plan. Disposal locations of hazardous wastes should be agreed with the NRA. The Contractor shall collect hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment or disposal at the temporary storage sites and further at the locations approved by NRA or pass it to the licensed operator having environmental permit on operation of the hazardous wastes.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• NRA to approve any waste disposal site.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Health and Safety</b>	Worker Health & safety	<p>The Contractor shall be responsible for provision of:</p> <ul style="list-style-type: none"> <li>• Safety Training Program. A Safety Training Program is required and shall consist of an Initial Safety Induction Course. All workmen shall be required to attend a safety induction course within their first week on Site and Periodic Safety Training Courses.</li> <li>• Safety Meetings. Regular safety meetings will be conducted on a monthly basis and shall require attendance by the safety representatives of Subcontractors unless otherwise agreed by the Engineer.</li> <li>• Safety Inspections. The Contractor shall regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<p>guarding equipment. Lights and signs shall be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately.</p> <ul style="list-style-type: none"> <li>• Safety Equipment and Clothing. Safety equipment and protective clothing are required to be available on the Site at all material times and measures for the effective enforcement of proper utilization and necessary replacement of such equipment and clothing, and all construction plant and equipment used on or around the Site shall be fitted with appropriate safety devices.</li> <li>• First Aid facilities. A fully equipped first aid base shall be climatically controlled to maintain the temperature of the inside of the building at 20 degrees C. Arrangements for emergency medical services shall be made to the satisfaction of the Engineer.</li> </ul> <p>The Contractor shall coordinate with local public health officials and shall reach a documented understanding with regard to the use of hospitals and other community facilities.</p>	
	Sub-contractor H&S	All sub-contractors will be supplied with copies of the SSEMP. Provisions will be incorporated into all sub-contracts to ensure the compliance with the SSEMP at all tiers of the sub-contracting. All sub-contractors will be required to appoint a safety representative who shall be available on the Site throughout the operational period of the respective sub-contract unless the Engineers approval to the contrary is given in writing. In the event of the Engineers approval being given, the Engineer, without prejudice to their other duties and responsibilities, shall ensure, as far as is practically possible, that employees of subcontractors of all tiers are conversant with appropriate parts of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors and sub-contractors activities.</li> </ul>
	HIV / AIDS	The Contractor shall subcontract with an Approved Service Provider to provide an HIV Awareness Program to the Contractor's Personnel and the Local Community as soon as practicable after the Contractor's Personnel arrive at the Site but in any case within two weeks after the Contractor's	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Service Provider to implement training.</li> </ul>

<b>Table 3: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		Personnel arrive at Site and to repeat the HIV Awareness Program at intervals not exceeding four months	<ul style="list-style-type: none"> <li>• Engineer to review program.</li> </ul>
<b>Historical and archaeological areas</b>	Impacts to Historical and archaeological areas	<p>To avoid potential adverse impacts to historic and cultural resources, the Contractor shall:</p> <ul style="list-style-type: none"> <li>• Adhere to accepted international practice and all applicable historic and cultural preservation requirements of the Government of Azerbaijan, including all appropriate local government entities, and</li> <li>• In the event of unanticipated discoveries of cultural or historic artifacts (movable or immovable) in the course of the work, the Contractor shall take all necessary measures to protect the findings and shall notify the Engineer and the Ministry of Culture. If continuation of the work would endanger the finding, project work shall be suspended until a solution for preservation of the artifacts is agreed upon.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Noise</b>	Construction Noise and Vibration	<p>The Contractor shall ensure provision of the following:</p> <ul style="list-style-type: none"> <li>• Source Controls, i.e., requirements that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken;</li> <li>• Site Controls, i.e., requirements that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible;</li> <li>• Work near Sensitive Receptors shall be limited to short term activities;</li> <li>• Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the Engineer having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. When operating close to sensitive areas such as residential, nursery, or medical facilities, the Contractor's hours of</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<p>working shall be limited to 8 AM to 6 PM;</p> <ul style="list-style-type: none"> <li>• Community Awareness, i.e., public notification of construction operations will incorporate noise considerations; methods to handle complaints will be specified. Sensitive receptors will be avoided as possible (i.e., aggregate crushers, operators, etc.). Disposal sites and haul routes will be coordinated with local officials;</li> <li>• Use of low volume charges will reduce the potential for vibration induced damage to structures; and in the event of damage proven to be due to the contractor's activities, owners of structures will be fully compensated.</li> </ul>	
<b>Flora and Fauna</b>	Affected flora and fauna	<ul style="list-style-type: none"> <li>• The Contractor shall record any affected trees and submit a detailed report to the Engineer.</li> <li>• Once any endemic animals are discovered at the site, the Contractor should ensure that such animals are not harmed and allowed to escape. Any breeding place should be left undisturbed. Contractor should issue strict instructions to workers not to harm endemic animals or breeding places of endemic species.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor should provide accurate list of affected trees at the site.</li> <li>• Contractor to issue strict instruction to workers against harming endemic species or their habitats.</li> </ul>

<b>Table 4: EMP Operational and Maintenance Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Air Quality</b>	Air quality impacts from Vehicle movements	Potential impacts due to the use of the new bridges and rehabilitated rural roads are the purview of ARS.	<ul style="list-style-type: none"> <li>• ARS to monitor air emissions during the operational phase of the Project against baseline data prior to construction or air quality standards</li> </ul>
<b>Soils</b>	Erosion	Contracts stipulated that the Contractor shall be liable for a one year defects liability period. During this year the NRAs should undertake regular observational monitoring of the Project Road to ensure that engineering works and vegetation growth have prevented erosion impacts. If the NRAs discover any potential issues they shall report their findings to the ARS who shall then make the Contractor responsible for final improvements. Final payments can not be made until outstanding issues are resolved	<ul style="list-style-type: none"> <li>• NRAs to monitor vegetation growth and erosion impacts during defects liability period.</li> </ul>
<b>Hydrology</b>	Impacts to hydrology and water quality) as a result of construction activities.	Contracts stipulated that the Contractor shall be liable for a one year defects liability period. During this year the locals NRAs should undertake regular water quality monitoring and routine observational monitoring of construction areas close to the 3 Rivers affected and its tributaries to ensure that the road works are not having any continuous impacts upon the hydrological conditions of the region. If the NRAs discover any potential issues they shall report their findings to the ARS who shall then make the Contractor responsible for final improvements. Final payments can not be made until outstanding issues are resolved.	<ul style="list-style-type: none"> <li>• NRAs to monitor water quality during defects liability period against baseline data prior to construction or air quality standards.</li> </ul>

**Table 5**  
**EMP: Pre-construction Phase Instrumental Monitoring**

<b>Issue</b>	<b>Mitigation</b>	<b>Locations</b>	<b>Schedule</b>	<b>Responsibilities</b>	<b>Reporting</b>
Water Quality Impacts due to construction works	The Contractor shall undertake baseline instrumental monitoring during the Pre-construction phase. Parameters to be monitored to establish a baseline include: <ul style="list-style-type: none"> <li>• Total Suspended Solids (TSS)</li> <li>• Biological Oxygen Demand (BOD)</li> <li>• Dissolved oxygen (DO)</li> <li>• Fecal coliform</li> <li>• Oil and grease</li> </ul>	Baseline monitoring locations include: <ul style="list-style-type: none"> <li>• 50 meters down stream of each borrow pit locations;</li> <li>• 50 meters downstream of each river bridge.</li> </ul> In addition, the Engineer may also recommend additional monitoring locations during baseline monitoring and during construction. However, as an indicator the number of sampling locations, including the baseline locations, should not exceed ten.	Water quality baseline monitoring shall be carried out as soon after the date of acceptance of the Bid as practicable to determine ambient levels of the pollutants at the specified monitoring locations which will be identified in the SSEMP.	The Contractor shall engage a third party monitoring agency to undertake the baseline monitoring. The Agency shall be approved by the NRA.	The Agency shall provide his results to the Contractor and Engineer prior to the start of Project works.
Air quality	The Contractor shall undertake baseline instrumental monitoring during the Pre-construction phase. Parameters to be monitored to establish a baseline include: <ul style="list-style-type: none"> <li>• Total Suspended Particulates (TSP)</li> <li>• Sulfur Dioxide (SO<sub>2</sub>)</li> <li>• Nitrogen Dioxide (NO<sub>2</sub>)</li> <li>• Carbon Monoxide (CO)</li> </ul>	The recommended baseline monitoring locations include 1 location at each construction site or every 10 Km on rural roads. In addition, the Engineer may also recommend additional monitoring locations during the baseline monitoring. However, as an indicator the number of sampling locations should not exceed ten.	Air quality baseline monitoring shall be carried out as soon after the date of acceptance of the Bid as practicable to determine ambient levels of the air pollutants at the specified monitoring locations which will be identified in the SSEMP.	The Contractor shall engage a third part monitoring agency to undertake the baseline monitoring. The Agency shall be approved by the NRA.	The Agency shall provide his results to the Contractor and Engineer prior to the start of Project works.

<b>Table 6</b>					
<b>EMP: Construction Phase Instrumental Monitoring</b>					
<b>Issue</b>	<b>Mitigation</b>	<b>Locations</b>	<b>Schedule</b>	<b>Responsibilities</b>	<b>Reporting</b>
<b>Air Quality</b>	The Contractor shall establish routine Air Quality Monitoring throughout the construction period. The following parameters shall be monitored: (TSP), Sulfur Dioxide (SO <sub>2</sub> ), Nitrogen Dioxide (NO <sub>2</sub> ) and Carbon Monoxide (CO). Other parameters maybe warranted as and when requested by the Engineer.	At the locations of the baselines monitoring and at any additional locations to be determined by the Engineer (not to exceed ten per monitoring period).	Monitoring to be undertaken once every three months	The Contractor shall hire an independent monitoring consultant to perform the monitoring activities.	The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.
<b>Surface Water Quality</b>	The Contractor shall ensure that routine surface water monitoring is undertaken throughout the construction period. Measured water quality parameters shall include <ul style="list-style-type: none"> <li>• Total Suspended solids (TSS)</li> <li>• Biological Oxygen Demand (BOD)</li> <li>• Dissolved oxygen (DO),</li> <li>• Conductivity</li> <li>• Fecal coliform</li> <li>• Oil and grease</li> </ul>	Locations will be determined in consultation with the Engineer and the NRA and shall include the baseline locations above and any other likely to be subject to water quality impacts or significant runoff (construction camps, staging areas, etc.).	Monitoring to be undertaken bi-monthly	Responsibilities – The Contractor shall hire an independent air quality monitoring consultant.	The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.
<b>Noise</b>	The Contractor shall ensure that routine noise monitoring is undertaken throughout the construction period. Parameters to be monitored to establish a baseline include: Laeq 1h (dBA)	Locations will be determined in consultation with the Engineer and the local NRA	Bi-Monthly throughout construction.	The Contractor shall hire an independent noise monitoring consultant.	The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.



## 1.0 Environmental Reporting

167. The contractor will submit monthly progress reports, which include a section on implementation status of environmental management measures. The environmental monitoring and management reports will be prepared by the Contractor's Safeguard Specialist with assistance from the Supervision Consultant. The reports will be submitted biannually to ADB who will disclose it to the public on receipt. The monitoring report will include the following: (i) compliance with ADB loan covenants and government regulations; (ii) significant issues or changes in scope; (iii) summary of monitoring report findings; (iv) required follow-up actions; and (v) conclusions.

## 2.0 Implementation Arrangements

168. The overall responsibility for environmental protection lies with the Ministry of Ecology and Natural Resources (MENR). At the rayon level they are represented by the rayon agency, which is located within or near the towns. The MENR is charged with a task of providing national monitoring services that includes a monitoring network of baseline information on water sources. Compliance with the EMP will be undertaken by the Safeguards Specialist at the Supervision Consultant as part of his/her technical supervisory duties.
169. The responsibility for construction standards is with the Ministry of Emergency Situations. Their standards together with ADB's environmental requirements will be incorporated into the Program design. There are no significant environmental management issues relating to the post construction and operation of the Program. Environmental management will be regulated through the existing legislation as well as specific clauses with the Contractor. Daily control and monitoring of construction works will be part of the Contractor's responsibilities.

Organization		Responsibilities
JSC	ARS, Program Consultant Social and Environ- mental Specialists, and PMF	<ul style="list-style-type: none"> <li>• Preparing Environmental Management Plan (EMP) for SEE review</li> <li>• Periodic submission of environmental monitoring report to ADB for public disclosure</li> <li>• Establishing environmental classifications under ADB regulations &amp; determining need for project IEEs</li> <li>• Screening &amp; preparation of EEs including cost estimates for mitigation measures &amp; monitoring plans</li> <li>• Conducting public consultations: Informing affected people and community focus groups before or during consultation in the early stage of IEE preparation and conducting continuing consultation during implementation in accordance with ADB and government requirements</li> <li>• Preparing IEEs for SEE and obtaining IEE clearance (development consent approval) from SEE</li> <li>• Submitting to ADB first IEE and all IEEs over \$2 million</li> <li>• Ensuring tender documents will be updated with any changes to the EMP</li> <li>• Ensuring contract document including environmental clearance certificate &amp; conditions and ensuring ADB gets copies of these documents</li> </ul>

Organization		Responsibilities
		<ul style="list-style-type: none"> <li>• Implementing and updating environmental mitigation and monitoring measures</li> <li>• Incorporating environmental requirements in civil work contracts</li> <li>• Performing water quality monitoring and reporting to the SEE and local governments</li> <li>• Performing civil work surveys</li> <li>• Ensuring the Contractors have access to the IEE reports</li> <li>• Ensuring that Contractors have fully implemented and completed the detailed EMP and have submitted this to SEE for approval</li> <li>• Providing environmental training</li> <li>• Undertaking remedial action when unexpected environmental impacts occur during implementation</li> <li>• Preparation and submission of quarterly reports to the SEE and ADB including i) compliance with ADB loan covenants and government regulations, ii) significant issues or changes in scope, iii) summary of monitoring report findings, and iv) required follow-up actions</li> <li>• Undertaking monitoring of operation and preparing monitoring reports every year for 4 years after construction</li> </ul>
PMF	Safeguards Specialist	<ul style="list-style-type: none"> <li>• Overall coordination with government entities and supervision responsibilities</li> <li>• Approval of the management contract</li> <li>• Submission of IEEs for SEE approval</li> <li>• Monitoring and evaluation of the Program</li> </ul>
Environmental Expert Group	SEE (within MENR)	<ul style="list-style-type: none"> <li>• Review of environmental clearance</li> <li>• Providing guidance for upholding environmental policy requirements</li> </ul>
ADB	Social and Environmental Sector Specialists	<ul style="list-style-type: none"> <li>• Reviewing first IEE and all IEEs over \$2million</li> <li>• Disclosing reports over ADBs website (Responsibility of ADB Project Leader)</li> <li>• Reviewing all statutory environmental clearances granted by SEE</li> <li>• Reviewing quarterly reports &amp; taking necessary actions</li> <li>• Monitoring EMP implementation and due diligence</li> </ul>
Local Govts		<ul style="list-style-type: none"> <li>• Coordination with ARS and making key decisions on behalf of the community</li> </ul>

### 3.0 Institutional Assessment

170. AzerRoadService acting as the PMF has significant experience with managing road based transport systems. The organization has accumulated experience through current and completed road & bridges improvement and construction works throughout the country.

171. During the construction phase, the environmental management and monitoring tasks will be coordinatively implemented by the PIU-ARS, construction supervision consultant (CSC) and contractor. The following are the personnel will be involved as follows:

- PIU Safeguard Specialist – Oversight monitoring and evaluation of the project's environmental, health and safety performance levels. Conducts site inspection as

needed and provide necessary evaluation of the project’s implementation of EMP and compliance to local regulations.

- Consultant International Environmental Specialist – conducts periodic inspection of contractor’s compliance to EMP and provides necessary assessment of periodic compliance and non-conformance/violations on environment, health and safety. Writes Bi-annual Environmental Monitoring Report for submission to PIU and ADB.
- Consultant National Environmental Specialist – Conducts regular monitoring of environmental situations at the project site and provide monthly environmental reports to the Consultant Project Manager (The Engineer). Coordinate closely with Consultant International Environmental Specialist regarding issues at the worksite, particularly non-compliance issues. Compile all monthly information for the International Environmental Specialist for the Bi-annual Environmental Monitoring Report. Coordinates any baseline measurements to be done by the Contractor.
- Contractor’s Environmental, Health and Safety Staff – Technical staff delegated to ensure compliance of the construction process with the EMP. Drafts and submits project-specific EMP based on the Project EMP. Obtains any baseline measurements as required by the contract including periodic measurements within the construction period. Submits periodic reports on environmental, health and safety aspects of the project to the Engineer.

#### 4.0 Environmental Management Budget and Resources

172. Most of the mitigation measures require the contractors to adopt good site practice, which should be part of their normal construction contract, so there are no additional costs to be included in the EMP. Costs of design-related mitigation measures are included in the budgets for the civil works.
173. The cost for hiring a Program Consultant covering social and environmental issues for the periods before, during and after construction are already included in the project implementation costs . The budget needed for the Safeguard Specialist and support staff has also to be included in the Program costs as these employees will come from within the AzerroadService.
174. The cost for the environmental monitoring on the consultancy side can be estimated with the Table below. This will include fees and other associated cost for management and monitoring of the four (4) bridges in the project.

Item	Quantity	Unit Cost	Total Cost
<b>Implementation of EMP (1 year)</b>		<i>US \$</i>	<i>US \$</i>
International Environmental Specialist (ISC)	2 months	<i>14,000</i>	<i>28000</i>
National Environmental Specialist (NSC)	12 months	<i>2,500</i>	<i>45,000</i>
OPE (travel, per diem, surveys/interviews, reporting, etc)	LS	<i>10,000</i>	<i>10,000</i>
<b>Total</b>			<b><i>68,000</i></b>

## **CONCLUSIONS & RECOMMENDATIONS**

### **1.0 Conclusions**

175. The level of environmental assessment within this IEE is sufficient to indicate the impacts of the Four Bridges Improvement Project in Agstafa District and to outline the necessary mitigation measures for the subproject. No additional studies, such as an EIA, are required. The proposed Four Bridges Improvement Project in Agstafa District will have significant positive impacts on the quality of life for community members through providing a safe, reliable water supply, and improved water distribution network. The proposed Environmental Management and Monitoring Plans in this IEE will ensure that proper water quality monitoring and environmental management is conducted. The IEE was disclosed to the public, and the stakeholder concerns were incorporated into the IEE.
176. As per the Republic of Azerbaijan's (RA) Law, the proposed subproject requires following permissions from the government regulatory agencies: Environmental permit and groundwater abstraction permit. AzerRoadService is in the process of obtaining both these permits before the award of contract for civil works.

### **2.0 Findings and Recommendations**

177. The environmental impacts of the all infrastructure elements proposed in Four Bridges Improvement Project in Agstafa District has been assessed and described in the previous sections of this document. Potential negative impacts were identified in relation to design, location, construction and operation of the improved infrastructure. Mitigation measures have been developed to reduce all negative impacts to acceptable levels.
178. According to this assessment, the proposed Four Bridges Improvement Project in Agstafa District is unlikely to cause any adverse environmental impacts because: (i) proposed subproject activities are designed primarily to improve the quality of life and quality of environment of the district; (ii) potential negative impacts associated with the design, construction and operation of the proposed Project activities will be temporary, minor, and localized in extent and can be mitigated to acceptable levels; (iii) no Project activities will involve permanent or temporary loss of income and/or livelihood; (iv) the institutional framework has been developed to specify the procedural requirements and responsibilities to ensure environmentally sustainable implementation; and (v) all construction and operation activities will be monitored and reported by ARS in accordance with the Environmental Monitoring Plan.
179. The construction stage Environmental Management Plan (Table 4) and the monitoring to be conducted by the Contractor (Construction phase monitoring indicated in Table 5) should form part of the contract documents. All the measures such as designing a robust system, availability of adequate manpower, O&M equipment and manual, and training is considering in the design of the project.

ANNEXES

1. Annex 1 – A. List of Attendees in the Public Consultation, 23 Oct. 2013-10-31

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Maraqlı tərəflərlə görüş ictimaiyyətə görüş.

(Layihənin adı) Dörd körpü Layihəsi.

Yeri: Agstafa şəhəri, Heydər Əliyev Prospekti,  
YAP rayon təşkilatının binəsi, 1-ci zal.

Tarixi: 23.10.2013.

No	Adı, Soyadı	İş yeri	Vəzifəsi	Telefon
1	Pashayev Yüqar	PIU	İngineer	
2	Qarayev Aqil	VMV	Tərcüməçi	
3	Najibova Səadət	VMV	Ekolog	
4	Səim Səpəyev	KOCKS	Ekspert	
5	İsmayılov	Tələh	Bələdiyyə sədri	050366-61-76
6	Əvəzov Səyid	Bələdiyyə	sədri	055-231-6848
7	Fəizə Əliyeva	26 saylı q.İ.İ.Ş.Ş.	Rəis	0504094888
8	Məmmədov Mürşad	Agstafa TRK	Rəis	050-375-5600
9	Məmmədov Rəşad	Agstafa HƏİİ	rəis	0503692606
10	Əhmədov Hacı	9 saylı UŞM	rəis	0502698813
11	Novruzov Səlim	Xətunə kənd i.N.Ş.	sədri	050-332-89-29
12	İsmayılov Kərim	Qarabənd kənd i.N.Ş.	sədri	050-330-95-25
13	Məmmədov Əlxan	Agstafa Əİ.Ş.	rəis	055443-0808
14	İsmayılov Məlik	Şolxələli Bələdiyyə	sədri	055-889-4861
15	Novruzov Əraz	Xətunə kənd İDD məmuru	Müavim	051-552-9140
16	Mikayılov Mikayıl	Qarayev qrs. İ.N.	Nümayəndəsi	0502658862
17	Mustafayev Əlxan	İcra nüv. şifri	İş müd.	0552011262
18	Əmraz Fəhiz Məhəlibəyov	Kövrəkli kənd İDD İcra nümayəndəsi	Nümayəndəsi	05037473-27
19	Əmrazov Rəşad İsmayılov	Əgri kənd İ.N.	nümayəndəsi	050-391-65-92
20	Mirzəslanov Həsən	Kövrəkli Bələdiyyə sədri	Bələdiyyə sədri	050716-95-56
21	Əmrazov Məhəmməd	Qarayev qrs.	Bələdiyyə sədri	051-8144-31

FOUR BRIDGES IMPROVEMENT PROJECT  
GANJA REGION, AGSTAFI DISTRICT, ROADS: R 24 and Y-05-08

No	Adı, Soyadı	İş yeri	Vəzifəsi	Telefon
22	Rəşad Hədiyev	Kəndli kmd idd üzr nümayəndəlik	nümayəndə	050-532-30-35
23	Səfər Niyazov	Ağstafa Sakanalıca	R21's	055 286 20 90
24	İsmayıl Fətəli	Ş. Sadıqlı üzr nü.	Nümayəndə	050 265 88 37
25	Əhmədov Rövşən	B. Kərimli Bələdiyyə	Sədr	050-501670
26	Guliyev Zərif	Ağöl. Bələdiyyə Sədr	Sədr	050-438-58-03
27	Əliyev Əhməd	Muganli Bələdiyyə	Sədr	050-682-67-13
28	Əhmədov Nəzirov	Ağstafa 550 R24 2022	R24 2022	050 514 05 01
29	Lətif Nəzirov	Ağstafa 550 R24 2022	Sədr	050 468 75 75
30	Əfəndi Əliyev	Ağstafa qəs. (R24), 2022	üzr nümayəndə	0701322755
31	Nəzirov Gülgöz	R24 2022	Nümayəndə	055 654-46-46
32	Əhmədov Səlim	Kəndli kmd idd	Müəllim	050 104 44 86
33	Səyidov Nəzirov	Düzgünlük kmd idd üzr nümayəndə	nümayəndə	055 740-86-31
34	Yusifov Vəqif	Düzgünlük kmd Bələdiyyə Sədr	Bələdiyyə	050 379-46-58
35	Əhmədov Yaqub	Düzgünlük kmd Sədr	Sədr	051-532-5102
36	Əhmədov Əli	Pirli kmd idd-nümayəndə	Nümayəndə	050-265-88-63
37	Əhmədov Yaqub	Pirli kmd nümayəndə	müəllim	070-974-73-83
38	Əliyev Səyid	Pirli kmd	taqribətçi	051-986-18-08
39	İsmayilov Əhməd	Sahəli qəs.	nümayəndə	050 265 88 35
40	Əliyev Əhməd	Sahəli qəs.	taqribətçi	051 918 58-06
41	İsmayilov Əhməd	Sahəli kmd	Bələdiyyə Sədr	050 368 95 17
42	Əhmədov Vəqif	Muganli kmd	nümayəndə	07 87 8 01 92
43	Bəkbəki Vəqif	Muganli k	taqribətçi	051-395-68-83
44	Əliyev Əhməd	Ağöl k.	nümayəndə müəllim	051-318-28-80

FOUR BRIDGES IMPROVEMENT PROJECT  
GANJA REGION, AGSTAFI DISTRICT, ROADS: R 24 and Y-05-08

<b>Number</b>	<b>Name</b>	<b>Position</b>	<b>Affiliation</b>	<b>Contact Number</b>
1	Pashayev Vugar	Engineer	PIU	
2	Qarayev Aqil	Translator	VMV	
3	Nayibora Saadat	Ekolog	VMV	
4	Sam Sapuay	Environment Specialist	Kocks	
5	Ismailov Taleh	Chief of Municipality		9506336176
6	Garayev Shorgi	Chief of Local Municipality		
7	Aliylu Samandar	Chief	No. 26 Local Road Unit	
8	Mahmudor Mirasgar	Chief	Agstafa Telecom	
9	Nasibor Yusif	Head	Agstafa NQTI	
10	Gahramanor Haji	Chief	YYMMC No.9	
11	Novruzov Selim	Executive Power Representative	Khilkhina village	
12	Isgandarov Hafiz	Executive Power Representative	Garahasanli Village	
13	Mammador Elkhan	Chief of Agstafa Region	Gas Exploration Department	
14	Ismayilov Malin	Head	Kholkhalafli Municipality	
15	Novruzov Anar	IHD Deputy	Khilkina Village	
16	Minayilov Mikayil	Executive Power Representative	Garayazi Village	
17	Mustafayev Elkhan	Head Accountant	in Executive Power	
18	Omarov Tahir	IAD Representative	Kocharli Village	
19	Osmanov Raguf	Boyuk Kesik	Executive Power Representative	
20	Amiraslana Alakbar	Head	Kochvalili Municipality	
21	Omarov Muhammad	Head	Garayazi Municipality	
22	Abdullayev Rashad	IHD Representative	Kochvalili Village	
23	Shahin Niyazov	Chief	Agstafa Water-channel Department	
24	Hajiyev Farhad	Executive Power Representative	Sadigli Village	
25	Ahmador Ravshan	Head	Boyuk Kesik Municipality	

Number	Name	Position	Affiliation	Contact Number
26	Suleymanov Zahir	Head	Aghgol Municipality	
27	Yusifov Ahmadali	Head	Mughanli Municipality	
28	Ibrahimov Museyib	Acting chief	Aghstafa Region Water-Management	
29	Latif Nagiyev	D/2 CT Chief	Aghstafa Region	
30	Tafarov Arif	Engineer	Aghstafa Region Road Department (PG-7)	
31	Nasibov Vugar	Village Representative	Kolkhalafi Village	
32	Orujov Sahil	School Teacher	Kolkhalafi Village	
33	Tagiyev Hasan	IHD Representative	Duzgishlag Village	
34	Yusifor Vagif	Head	Duzgishlag Village Municipality	
35	Zeynalov Yunis	Resident	Duzgishlag Village	
36	Mammador Arif	IHD Representative	Pirili Village	
37	Mammador Tagub	Deputy (Executive Power Representative)	Pirili Village	
38	Aliyev Sagif	Resident	Pirili Village	
39	Ismayelov Tarad	Representative	Saloglu Village	
40	Najiyev Ahmad	Resident	Saloglu Village	
41	Isgandarov Nizami	Head	Saloglu Village Municipality	
42	Abdullayev Vugar	Representative	Mughanli village	
43	Babanli Valeh	Resident	Mughanli village	
44	Yusifov Vuswal	Deputy (representative)	Ahgol Region	

## 2. Annex 1 – B. Open Forum Questions and Answers

Questions/Comment	Response
<p><u>Hajiyev Carhad Mohammadali Oglu</u></p> <p>He emphasized his gratitude for this project and appreciates this presentation.</p> <p>Question: Will the construction of these bridges be simultaneously (at the same time)?</p>	<p>Response by PIU representative:</p> <p>All bridges are the part of one project and will begin at the same time.</p>
<p><u>Zeynalov Yunis</u></p>	<p>Response by PIU representative:</p>



Questions/Comment	Response
Question: Will Azeri company supervise the works? Who will be engineering company?	Design is prepared by German company. But Engineering and Construction company will be known after tender.
<u>Elkhan Mammadov:</u>  Question 1): Does the bridge, considering it as Category II, take into account pedestrian walkways?  Question 2): Bridge No. 2 will be constructed over river, and we have gas pipeline in that place. Is it considered in this project the use bridge for relocation the gas pipeline for the adjacent villages?	Response by PIU representative:  This pedestrian walkway is considered in the design of bridges and will be at the edges of dual carriageways  There are some pipes considered to be relocated, but diameter smaller ones (dia: 100 mm)
<u>Shahin Niyazov</u>  Question: There is another bridge existing by the railway at Km 19. Is it also being planned for construction of that bridge?	Response by PIU Representative:  Possibly in future projects

### 3. Annex 1 – C. Submitted Questions

No.	Name	Address	Comment/ Questions	Response/Mitigation Measures
1	Isgandarov Hafiz	Garayasi Village	Will the bridge be constructed on road going to Sarahasamli Village above river?	For this project, only the four identified bridge will be reconstructed.
2	Mustafayev Elkhan	Garayasi Village	I appreciate and no comments	
3	Mikhalove Mikayel	Garayasi Village	No comment No question	
	Ismayilov Taleh	Khilkina Village	Will you construct bridge on roadway going to Khilkina Village (Aghstafa)	For this project, only the four identified bridge will be reconstructed.
	Garamanov Haji	Agstafa City	None (Blank)	
	Garayev Shovagi	Garayasi Village	You are requested that a next 5 <sup>th</sup> bridge be construct at Aghstafa region, Garahansali road area, above the bridge 4 <sup>th</sup> bridge	Other bridges will be covered in future projects

FOUR BRIDGES IMPROVEMENT PROJECT  
GANJA REGION, AGSTAFI DISTRICT, ROADS: R 24 and Y-05-08

<b>No.</b>	<b>Name</b>	<b>Address</b>	<b>Comment/ Questions</b>	<b>Response/Mitigation Measures</b>
	Naruzov Anov	Khilkina Village	No comment No questions	
	Novruzov Salim	Agstafa City	No comment No questions	

**4. Annex 2 – Sample Complaint Form**



**GRIEVANCE REDRESS MECHANISM**

**COMPLAINT FORM**  
(sample only)

Date: \_\_\_\_\_ GRM Ref. No.: \_\_\_\_\_

Project Component: \_\_\_\_\_ Received by: \_\_\_\_\_

Complainant's Name/s: \_\_\_\_\_ Address: \_\_\_\_\_

Signature/s: \_\_\_\_\_ Contact Nos.: \_\_\_\_\_

**Details about the Complaint:**

1. *What is the current situation:* \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. *Background/ What happened?:* \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. *Impacts to the Complainant:* \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. *Complainant's opinion on remedies / solution:* \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Note: Provide Additional Sheets as necessary**

**Initial Assessment:**

Nature & Category \_\_\_\_\_

GRM Coordinator's Remarks/ Recommendations: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Proposed Action: \_\_\_\_\_  
\_\_\_\_\_



6. Annex 3 – EMP for Bridge No. 1

**Environmental Management Plan**  
**BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI**

<b>Table 1: BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Air Quality</b>	Air quality impacts from stationary sources	Locations for quarry sites, borrow pits and asphalt plants shall require approval from the Engineer and National & Regional Authorities (NRA) during the Pre-construction phase. Efforts should be made to ensure that these facilities are as near to the Project bridge as practical to avoid unnecessary trips and potential dust issues from vehicle movements during construction works. In addition, no quarry, borrow pit or asphalt plant shall be located within 300 meters of any urban area, protected area or sensitive receptor.	<ul style="list-style-type: none"> <li>• Contractor to select sites</li> <li>• Engineer and NRAs to approve sites.</li> </ul>
<b>Topography</b>	Selection of Quarry Sites	<p>Several potential quarry sites have been identified by AzerRoadService (ARS), although they do not currently have permits. These quarry sites must obtain the required permits for these sites prior to commencement of works. This shall include approval from the NRA and the Engineer. Efforts should be made to ensure that quarries are as near to the site as practical to avoid unnecessary journeys. However, no quarry shall be located within one kilometer of any urban area, protected area or sensitive receptor. The locations of the quarries shall be indicated within the Contractors SSEMP. In addition, Contractors should ensure that quarries and crusher plants are:</p> <ul style="list-style-type: none"> <li>- Located at least 300 meters from residential areas to prevent noise and dust impacts;</li> <li>- Located outside of agricultural land; and</li> <li>- Where possible located on government owned lands.</li> </ul> <p>In addition, alluvial material which will be excavated upstream from blocked culvert areas may be used as base material. This material shall be tested by the Contractor and Engineer for its suitability as base material before it maybe used. A quarry site reinstatement plan should be presented to the Engineer prior to operating quarry sites. Such plan should be implemented prior to the end of the project.</p>	<ul style="list-style-type: none"> <li>• Contractor to select quarry sites and apply for approval from NRAs and any other regulatory agencies.</li> <li>• Engineer to review quarry locations, licenses and approvals from ARS and NRA.</li> <li>• Engineer to test suitability of alluvial material.</li> <li>• Engineer to verify and approve the quarry site reinstatement plan</li> </ul>

**Table 1:  
BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Pre-construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
Hydrology / Soils	Selection of Borrow Pits	Due to the sensitivity of the borrow pit locations, the Contractor shall prepare a Borrow Pit Action Plan (BAP) that should be submitted as part of the SSEMP to the Engineer prior to the start of construction. The plan will identify the locations of all proposed borrow pits. The locations of the borrow pits shall be approved by both, the Engineer, and ARS, and the NRAs. No borrow pit shall be located within five hundred meters of any protected area. The locations of the borrow pits shall be indicated within the Contractors SSEMP. In addition, the Contractor should present a borrow pit reinstatement plan.	<ul style="list-style-type: none"> <li>• Contractor to select borrow sites and apply for approval from NRAs and any other regulatory agencies.</li> <li>• Engineer to review borrow locations, licenses and approvals from ARS and NRA.</li> <li>• Engineer to verify and approve the borrow pit reinstatement plan</li> </ul>
	Selection of Asphalt Plant Location	No new asphalt plant shall be located within five hundred meters of any urban area, protected area or sensitive receptor. The locations of the asphalt plants shall be indicated within the Contractors SSEMP. Asphalt plant locations shall be approved by the Engineer, ARS and the NRA.	<ul style="list-style-type: none"> <li>• Contractor to select sites and apply for approval from NRAs and any other regulatory agencies.</li> <li>• Engineer to review locations, licenses and approvals from ARS and NRA.</li> </ul>
	Selection of Construction Camp Site	<p>The Contractor shall be responsible for the preparation of a Construction Camp Site Plan which will form part of the SSEMP. The Plan shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. The Contractor shall ensure the following conditions are met within the Plan:</p> <ul style="list-style-type: none"> <li>• Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.</li> <li>• There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited.</li> <li>• Liquid material storage containment areas shall not drain directly to surface water.</li> <li>• Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.</li> <li>• Construction and work sites will be equipped with sanitary latrines that do not</li> </ul>	<ul style="list-style-type: none"> <li>• Engineer to review &amp; approve Site Plan</li> </ul>

**Table 1:  
BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Pre-construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<p>pollute surface waters.</p> <ul style="list-style-type: none"> <li>• Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.</li> <li>• Spill clean up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage: <ul style="list-style-type: none"> <li>- Fueling operations shall occur only within containment areas.</li> <li>- All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>- Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.</li> <li>- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.</li> <li>- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.</li> <li>- Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secured area for disposal to a site authorized for hazardous waste.</li> </ul> </li> </ul> <p>Site plans shall be devised to ensure that, insofar as possible, all temporary construction facilities are located at least 50 meters away from a water course, stream, or canal. If determined warranted by the Engineer, the Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor shall ensure that all vehicle are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.</p>	

<b>Table 1: BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Soils</b>	Contamination of Soils	The Contractor will be responsible for preparation of an Emergency Response Plan (ERP), which will cover containment of hazardous materials, oil spills, and work-site accidents. The plan will detail the process for handling, and subsequently reporting, emergencies, and specify the organizational structure (including responsibilities of nominated personnel). The plan will be submitted to the Engineer for approval as part of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to prepare ERP</li> <li>• Engineer to review and approve ERP as part of the SSEMP</li> </ul>
<b>Air Quality</b>	Air Quality	The Contractor shall be responsible for the preparation of an Air Quality Plan (AQP), submitted to the Engineer prior to commencement of the works. The plan will detail the action to be taken to minimize dust generation (e.g. spraying unsurfaced roads with water, covering stock-piles, and blasting with use of small charges etc) and will identify the type, age and standard of equipment to be used. The Plan shall also include contingencies for the accidental release of toxic air pollutants. The Plan shall be completed during the design phase and shall form part of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to prepare AQP</li> <li>• Engineer to review and approve ERP as part of the SSEMP</li> </ul>
<b>Flora</b>	Vegetation procurement	The Contractor shall be responsible for identifying locations where he may procure specific vegetation for slope stabilization. The vegetation types should include; Elm - <i>Celtis caucasica</i> , Judas-tree, certis – <i>Certis</i> , Senna- <i>Colutea vulgaris</i> & Dog rose - <i>Rosa cocanika</i> . Embankment for bridge approaches should be stabilized as per design and with the use of native grasses and vegetation in conformance with the design.	<ul style="list-style-type: none"> <li>• Contractor to select sites.</li> </ul>
<b>Land Use</b>	Loss of Property and Land	In such circumstances necessary, the ARS must prepare the Land Acquisition and Resettlement Plan (the LARP), obtain the approval of ADB and then implement the plan and acquire the land prior to the start of Pre-construction activities.	<ul style="list-style-type: none"> <li>• ARS to complete LARP (when necessary)</li> <li>• ADB to approve LARP (when necessary)</li> </ul>
<b>Waste and Spoil</b>	Waste Management	The Contractor shall be responsible for preparing a Waste Management Plan (WMP) to manage all excess spoil and waste material. The Plan, which forms part of the SSEMP, shall include items relating to the safe handling and management of: <ul style="list-style-type: none"> <li>• Domestic waste</li> <li>• Food waste</li> <li>• Inert garbage</li> <li>• Recycled Waste</li> <li>• Plastic</li> <li>• Metals</li> <li>• Wood</li> <li>• Construction Waste</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to prepare WMP</li> <li>• Engineer to review and approve WMP as part of the SSEMP</li> </ul>



<b>Table 1: BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Pre-construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<ul style="list-style-type: none"> <li>• Hazardous Waste</li> <li>• Liquid Waste</li> </ul> <p>The Plan will also include provisions to manage all excess spoil material. The Plan should indicate where the spoil will occur and methods and locations for disposal.</p>	
<b>Health and safety</b>	Worker Health and Safety	A Health and Safety Plan (HSP) shall be prepared by the Contractor, as part of the SSEMP, to manage worker safety. The plan shall include an item relating to accidental release of toxic fumes.	<ul style="list-style-type: none"> <li>• Contractor to prepare HSP</li> <li>• Engineer to review and approve HSP as part of the SSEMP</li> </ul>
<b>EMP Requirement</b>	Preparation of SSEMP	<p>The Contractor shall prepare a SSEMP to meet the requirements of this EMP. Specifically the SSEMP shall contain sections relating to:</p> <ul style="list-style-type: none"> <li>• Management of Physical Environment <ul style="list-style-type: none"> <li>- Soils</li> <li>- Water</li> <li>- Air</li> </ul> </li> <li>• Management of Ecological Environmental <ul style="list-style-type: none"> <li>- Flora</li> <li>- Fauna</li> <li>- Protected Areas</li> </ul> </li> <li>• Management of Economic Characteristics <ul style="list-style-type: none"> <li>- Infrastructure</li> <li>- Transport</li> <li>- Land Use</li> <li>- Agriculture</li> </ul> </li> <li>• Management of Social and Cultural Resources <ul style="list-style-type: none"> <li>- Communities, Health and Education Facilities</li> <li>- Historical and Cultural Areas</li> <li>- Noise</li> </ul> </li> </ul> <p>In addition, the SSEMP shall contain specific Management Plans as Annexes relating to the following:</p> <ul style="list-style-type: none"> <li>• Borrow Pit Management Plan</li> <li>• Air Quality Management Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to prepare SSEMP</li> <li>• Engineer to review and approve SSEMP</li> </ul>

<b>Table 1: BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<ul style="list-style-type: none"> <li>• Water Quality Management Plan</li> <li>• Noise Management Plan</li> <li>• Waste Management Plan</li> <li>• Emergency Response Plan</li> <li>• Dust Suppression Plan</li> <li>• Site Plan</li> <li>• Health and Safety Plan</li> </ul> <p>Each section shall describe the precise location of the required mitigation / monitoring, the persons responsible for the mitigation / monitoring, the schedule and reporting methodology. The SSEMP must be submitted within 30 days of the contract award and construction cannot commence until the SSEMPs are approved by the ARS and the Engineer.</p>	
	Incorporation of Items into Bid Documents	The Contractor shall be responsible for ensuring compliance with this EMP. A specific environmental section shall be included within the main Bid Documents indicating that the Contractor shall be responsible for conforming to the requirements of the EMP. As such this EMP shall be included as an annex to the Contract Bid Documents.	<ul style="list-style-type: none"> <li>• ARS to ensure EMP is included within Bid Documents</li> </ul>

**Table 2:  
BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Detailed Design Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
<b>Soils</b>	Soil Erosion	To reduce the impacts of erosion, the Contractors Detailed Designs shall ensure: <ul style="list-style-type: none"> <li>The side slopes of embankments will be designed to reflect soil strength and other considerations as included in the project specifications in order to reduce slips or erosion;</li> <li>For embankments greater than 6m, stepped embankments will be used;</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to include mitigations in his detailed design.</li> <li>Engineer to review and approve design documents.</li> </ul>
<b>Geology and Seismic Conditions</b>	Seismic Issues	The seismic characteristics of the potentially affected area shall be taken into account during the Detailed Design phase of the Project. Earthquake loading shall be applied to the design of structures, including bridges, to ensure that seismic events do not have negative impacts during the operational phase of the Project.	<ul style="list-style-type: none"> <li>Contractor to include mitigations in his detailed design.</li> <li>Engineer to review and approve design documents.</li> </ul>
<b>Hydrology</b>	Drainage	Consideration in the design phase will be given to the issue of drainage and culverts to ensure that drainage patterns are improved from the existing conditions and that increased run-off does not occur or result in flooding of areas previously undisturbed. During design, the Contractor shall ensure that all drainage works are designed based on the historical flood data and flood forecasting. A design discharge of 50 years return period is considered for culverts, and 100 years of bridges. The design of all structural components must conform to the design standards provided in the Employer's Special Requirements.	<ul style="list-style-type: none"> <li>Engineer to review and approve design documents.</li> </ul>
	Drilling of Boreholes	The Contractor shall ensure that all required permits have been gathered prior to the excavation of any borehole.	<ul style="list-style-type: none"> <li>Contractor to gather permits</li> <li>Engineer to review permits prior to excavation works commencement.</li> </ul>
	Bridge Construction	All new and widened bridges must be designed for the life expectancy of 75 years. The bridge rehabilitation and strengthening works must be designed for the life expectancy of 50 years. The design loading and design of all structural components must conform to the bridge design standards provided in the Employer's Special Requirements. Finally, the bridge design and layout must be aesthetically pleasing and in harmony with the existing environment.	<ul style="list-style-type: none"> <li>Engineer to review and approve design documents.</li> </ul>
<b>Historical and Archaeological Sites</b>	Impacts to Historical and Archaeological Sites	Designs shall ensure that there is no significant encroachment to any historical or archaeological site eventually discovered during Detailed Design.	<ul style="list-style-type: none"> <li>Contractor to include mitigations in his detailed design.</li> <li>Engineer to review and</li> </ul>

**Table 2:**

**BRIDGE No. 1 R-24AGSTAFI-POYIU-SADIQLI: EMP Detailed Design Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
			approve design documents.
<b>Flora</b>	Loss of Trees	During Detailed Design the Contractor shall ensure that roadside activities such as asphalt plants, construction camps and other ancillary features are properly sited as agreed with the relevant CEP. The Contractor should avoid loss of trees where possible and should employ techniques such as asymmetrical widening. Where trees must be felled, the Contractor shall ensure that each one removed should be replaced by at least two new saplings of the same species or other at suitable locations, all as designated by the tree owner,	<ul style="list-style-type: none"> <li>• Contractor to include mitigations in his detailed design.</li> <li>• Engineer to review and approve design documents.</li> <li>• Contractor to replace trees during Construction with oversight from the Engineer.</li> </ul>
<b>Health and Safety</b>	Safety	The Contractor shall ensure that traffic safety issues shall be accounted for during the design phase of the Project, they including incorporation of: <ul style="list-style-type: none"> <li>• Safety barriers</li> <li>• Traffic signs</li> <li>• Road Crossings</li> <li>• Speed Bumps</li> <li>• Speed limits</li> </ul>	<ul style="list-style-type: none"> <li>• Engineer to review and approve design documents.</li> </ul>

**Table 3:**

**BRIDGE No. 1 R-24AGSTAFI-POYIU-SADIQLI: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
<b>Air Quality</b>	Open burning of waste materials	The Contractor shall ensure no burning of debris or other materials will occur on the Site without permission of the Engineer.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Fuel Emissions	Contractor shall ensure that no furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the Engineer.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Engineer to routinely monitor Contractors</li> </ul>

**Table 3:**

**BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
	Exhaust emissions from the operation of construction machinery	<p>The Contractor shall ensure construction equipment shall be maintained to a good standard and fitted with pollution control devices. The equipment (including the pollution control devices) will be checked at regular intervals by the Engineer to ensure they are maintained in working order and the inspection result will be recorded by the Contractor &amp; Engineer as part of environmental monitoring. In addition, the Contractor shall:</p> <ul style="list-style-type: none"> <li>• Discourage of the idling of engines;</li> <li>• Prohibit of the use of equipment and machinery that causes excessive pollution (i.e. visible smoke) at project work sites;</li> <li>• Ensure material stockpiles being located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne.</li> </ul>	<p>activities.</p> <ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Fugitive emissions from quarries and asphalt plants.	<p>The Contractor shall ensure that conveyor belts at ancillary facilities (e.g. quarries) shall be fitted with wind-boards, and conveyor transfer points and hopper discharge areas shall be enclosed to minimize dust emission. All conveyors carrying materials that have the potential to create dust shall be totally enclosed and fitted with belt cleaners.</p>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Dust generated from haul roads, unpaved roads, exposed soils and material stock piles.	<p>The Contractor shall ensure that the following dust suppression measures shall be instituted:</p> <ul style="list-style-type: none"> <li>• All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s);</li> <li>• Areas of reclamation shall be completed, including final compaction, as quickly as possible consistent with good practice to limit the creation of wind blown dust.</li> <li>• Hard surfaces will be required in areas with regular movements of vehicles; and</li> <li>• Effective use of water sprays will be implemented (e.g., all roads within the construction areas of the Site shall be sprayed at least twice each day, and more if necessary to control dust to the satisfaction of the Engineer). This includes any temporary traffic diversion road which shall be used in lieu of the bridge that will be under construction.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Topography</b>	Cut and Fill Requirement	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>• Temporary and permanent storage of materials should be confined to government owned land and in no circumstances should be dumped on agricultural or productive</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely</li> </ul>

**Table 3:  
BRIDGE No. 1 R-24AGSTAFI-POYIU-SADIQLI: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<p>lands or to any watercourse including irrigation channels.</p> <ul style="list-style-type: none"> <li>In the event of any spoil or debris from construction works being deposited in any of the afore mentioned areas or any silt washed down to any area, then all such spoil, debris or material and silt shall be immediately removed and the affected land and areas restored to their natural state by the Contractor to the satisfaction of the Engineer.</li> </ul>	<p>monitor Contractors activities.</p> <ul style="list-style-type: none"> <li>Approvals for waste disposal sites to be sought from the NRA by the Contractor.</li> </ul>
	Slope Stabilization	<p>The Contractor shall be responsible for the following:</p> <ul style="list-style-type: none"> <li>Final forming and re-vegetation will be completed by the Contractor as soon as possible following fill placement to facilitate regeneration of a stabilizing ground cover.</li> <li>Trenching will be used where necessary to ensure successful establishment of vegetation.</li> <li>Seeding with a fast growing crop and native seed mix (see <b>Specifications for list of species</b>) will occur immediately after fill placement to prevent scour and to encourage stabilization;</li> <li>Construction in erosion and flood-prone areas will be restricted to the dry season.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
	Quarries	<p>If licensed quarries are not available the Contractor may be made responsible for setting up their dedicated quarries. Prior to opening of any quarry or rock crushing facility, the Contractor will require approval from the relevant NRA and the Engineer to ensure that land owners are adequately compensated for land use and that the sites are not located in an area likely to cause significant detriment to the local environment. To ensure that this is the case Contractors should ensure that quarries and crusher plants are:</p> <ul style="list-style-type: none"> <li>Located at least 300 meters from urban areas to prevent noise and dust impacts;</li> <li>Located outside of agricultural land; and</li> <li>Where possible located on government owned lands.</li> <li>Quarry area should be reinstated prior to the completion of the project.</li> </ul>	<ul style="list-style-type: none"> <li>NRA to approve locations.</li> <li>Contractor to obtain necessary permits.</li> <li>Engineer to review permits and approvals prior to the opening of the site.</li> <li>Engineer to inspect the reinstatement work on the quarry area by the Contractor</li> </ul>
		<p>Alluvial material which will be excavated upstream from blocked culvert areas may be used as base material. This material shall be tested by the Contractor and Engineer for its suitability as base material before it maybe used. The Contractor must use such material first before using any other quarry or borrow pit within 3 km from any such alluvial deposit.</p>	<ul style="list-style-type: none"> <li>Engineer to test material before use as base material.</li> </ul>
	Borrow Pits.	The Contractor shall ensure that:	<ul style="list-style-type: none"> <li>Contractor to implement</li> </ul>

<b>Table 3: BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<ul style="list-style-type: none"> <li>• Pit restoration will follow the completion of works in full compliance all applicable standards and specifications.</li> <li>• Arrangements for opening and using material borrow pits will contain enforceable provisions.</li> <li>• The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Engineer will be required before final acceptance and payment under the terms of contracts.</li> <li>• Additional borrow pits will not be opened without the restoration of those areas no longer in use.</li> <li>• Borrow pits should be reinstated prior to completion of the Project</li> </ul>	<p>mitigation</p> <ul style="list-style-type: none"> <li>• Engineer to routinely monitor Contractors activities.</li> <li>• Engineer to inspect the reinstatement work on the borrow pit by the Contractor</li> </ul>
<b>Soils</b>	Loss of Land for Agricultural Production	The Engineer shall ensure that all appropriate LARP measures have been taken by the ARS before any alteration or destruction of agricultural land by the Contractor.	<ul style="list-style-type: none"> <li>• Engineer to coordinate with ARS &amp; Contractor.</li> </ul>
	Erosion	<p>The Contractor will be responsible for ensuing:</p> <ul style="list-style-type: none"> <li>• Material that is less susceptible to erosion will be selected for placement around bridges and culverts.</li> <li>• Re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local flora (see <b>Specifications</b>); (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth, although due to the arid conditions in most of the road, this may only feasible where there is regular rainfall or other natural water supply.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Contamination due to Spills or Hazardous Materials	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>• All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>• The construction camp maintenance yard shall be constructed on impervious Layer with adequate drainage to collect spills, there shall be no vehicle maintenance activities on open ground.</li> <li>• Filling and refueling shall be strictly controlled and subject to formal procedures. Drip</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

**Table 3:**

**BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<p>pans shall be placed under all filling and fueling areas. Waste oils shall be stored and disposed of by a licensed contractor.</p> <ul style="list-style-type: none"> <li>• All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>• The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any soils.</li> <li>• No bitumen drums or containers, full or used, shall be stored on open ground. They shall only be stored on impervious Layer.</li> <li>• Areas using bitumen shall be constructed on impervious Layer to prevent seepage of oils into the soils.</li> </ul>	
<b>Hydrology</b>	Drainage and Flooding	<p>The Contractor shall ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>• During the construction phase the Contractor is required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works.</li> <li>• The Contractor shall arrange with the village representatives those works which might interfere with the flow of irrigation waters to be carried out at such times as will cause the least disturbance to irrigation operations.</li> <li>• Should any operation being performed by the Contractor interrupt existing irrigation facilities, the Contractor shall restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Construction Camps and Storage Areas	<p>The Contractor shall ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.</li> <li>• There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited.</li> <li>• Liquid material storage containment areas shall not drain directly to surface water.</li> <li>• Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.</li> <li>• Construction and work sites will be equipped with sanitary latrines that do not pollute</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>



**Table 3:**

**BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<p>surface waters.</p> <ul style="list-style-type: none"> <li>• Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.</li> <li>• Spill clean up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage: <ul style="list-style-type: none"> <li>- Fueling operations shall occur only within containment areas.</li> <li>- All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>- Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.</li> <li>- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.</li> <li>- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.</li> <li>- Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized for hazardous waste.</li> </ul> </li> <li>• If determined warranted by the Engineer, the Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor shall ensure that all vehicle are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.</li> </ul>	
<b>Flora and Fauna</b>	Loss of flora	<p>The Contractor shall ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Each tree removed by the Contractor should be replaced by at least two new</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> </ul>

**Table 3:**

**BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		saplings of the same species or other at suitable locations, all as designated by the tree owner. <ul style="list-style-type: none"> <li>Supplying appropriate and adequate fuel in workers' camps to prevent fuel-wood collection from unauthorized sources.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
	Affected flora and fauna	<ul style="list-style-type: none"> <li>The Contractor shall record any affected trees and submit a detailed report to the Engineer.</li> <li>Once any endemic animals are discovered at the site, the Contractor should ensure that such animals are not harmed and allowed to escape. Any breeding place should be left undisturbed. Contractor should issue strict instructions to workers not to harm endemic animals or breeding places of endemic species.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor should provide accurate list of affected trees at the site.</li> <li>Contractor to issue strict instruction to workers against harming endemic species or their habitats.</li> </ul>
	Protected Areas	The opening of additional borrow pits shall require the Contractor to receive the approval of the Environmental Agency and the Engineer to ensure there are no detrimental impacts to protected areas.	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Land Use</b>	Construction Camps and other ancillary facilities	The Contractor will be required to coordinate all construction camp activities with neighbouring land uses. The Contractor shall also be responsible to maintain and cleanup campsites and respect the rights of local landowners. If located outside the RoW, written agreements with local landowners for temporary use of the property will be required and sites must be restored to a level acceptable to the owner within predetermined time period.	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Transport and Infrastructure</b>	Road closures, diversions and blocking of access routes	The Contractor shall ensure that: <ul style="list-style-type: none"> <li>He shall be responsible for provision of all road diversion signs and ensure that diversion roads do not impact negatively upon private lands.</li> <li>Any diversions shall be agreed upon by the Engineer.</li> <li>Notices of delays, due to blasting (if any), shall be posted in villages within ten kilometers of the blasting area so villagers can plan their travel times accordingly.</li> <li>The Contractor shall be responsible for ensuring that all access routes are kept open during Project works for at least 50% of the day during construction works and 100% of the time after construction works are completed for the day.</li> <li>Maintenance and dust suppression activities shall be performed by the contractor</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>

**Table 3:  
BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		along all access road and diversion/ or detour roads.	
	Electrical Systems	During construction the Contractor shall ensure that all power lines be kept operational, this may include the provision of temporary transmission lines while existing poles and lines are moved. The only exception to this item will be during periods of blasting when HV power lines will be switched off for safety.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Train Traffic	During the construction period the Contractor should ensure that train traffic is not impeded nor disrupted by construction activities and to ensure safe vehicular crossings at junctions and bridged construction site over the railroad. The contractor shall designate a safety officer to ensure that safety and precautionary measures are installed. It will be the contractor's responsibility to coordinate with relevant railway agencies to ensure sufficient level of safety at the bridge construction site	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors safety measures.</li> </ul>
<b>Waste and Spoil</b>	Spoil	Under no circumstances shall the Contractor dump excess materials on private lands without permission of the owner and approval from the Engineer.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• NRA to approve any waste disposal to the River.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Inert Solid & Liquid waste	The contractor shall be responsible for the following: <ul style="list-style-type: none"> <li>• Provide refuse containers at each worksite;</li> <li>• Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all wastes before transportation and final disposal;</li> <li>• Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process, and</li> <li>• Collect and transport non-hazardous wastes to all approved disposal sites. The sites for waste disposal shall be agreed with the local municipal authorities and NRA. A specialized company may be contracted, if available to ensure collection of domestic and general waste from camps and temporary storage areas and transportation to landfills approved and licensed by the NRA.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• NRA to approve any waste disposal site.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Asphalt	It is recommended that discussions are undertaken with ARS to determine if it is feasible	<ul style="list-style-type: none"> <li>• ARS to assess feasibility.</li> </ul>

**Table 3:**

**BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		to re-process the asphalt for use on other local roads throughout the region. If it is determined to be cost effective, the Project should consider procuring equipment for this purpose.	
	Hazardous Waste	Management, handling & storage protocols for hazardous waste will be outlined in the Contractors Waste Management Plan. Disposal locations of hazardous wastes should be agreed with the NRA. The Contractor shall collect hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment or disposal at the temporary storage sites and further at the locations approved by NRA or pass it to the licensed operator having environmental permit on operation of the hazardous wastes.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• NRA to approve any waste disposal site.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Health and Safety</b>	Worker Health & safety	<p>The Contractor shall be responsible for provision of:</p> <ul style="list-style-type: none"> <li>• Safety Training Program. A Safety Training Program is required and shall consist of an Initial Safety Induction Course. All workmen shall be required to attend a safety induction course within their first week on Site and Periodic Safety Training Courses.</li> <li>• Safety Meetings. Regular safety meetings will be conducted on a monthly basis and shall require attendance by the safety representatives of Subcontractors unless otherwise agreed by the Engineer.</li> <li>• Safety Inspections. The Contractor shall regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. Lights and signs shall be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately.</li> <li>• Safety Equipment and Clothing. Safety equipment and protective clothing are required to be available on the Site at all material times and measures for the effective enforcement of proper utilization and necessary replacement of such equipment and clothing, and all construction plant and equipment used on or around the Site shall be fitted with appropriate safety devices.</li> <li>• First Aid facilities. A fully equipped first aid base shall be climatically controlled to maintain the temperature of the inside of the building at 20 degrees C. Arrangements for emergency medical services shall be made to the satisfaction of the Engineer.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

**Table 3:**

**BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		The Contractor shall coordinate with local public health officials and shall reach a documented understanding with regard to the use of hospitals and other community facilities.	
	Sub-contractor H&S	All sub-contractors will be supplied with copies of the SSEMP. Provisions will be incorporated into all sub-contracts to ensure the compliance with the SSEMP at all tiers of the sub-contracting. All sub-contractors will be required to appoint a safety representative who shall be available on the Site throughout the operational period of the respective sub-contract unless the Engineers approval to the contrary is given in writing. In the event of the Engineers approval being given, the Engineer, without prejudice to their other duties and responsibilities, shall ensure, as far as is practically possible, that employees of subcontractors of all tiers are conversant with appropriate parts of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors and sub-contractors activities.</li> </ul>
	HIV / AIDS	The Contractor shall subcontract with an Approved Service Provider to provide an HIV Awareness Program to the Contractor's Personnel and the Local Community as soon as practicable after the Contractor's Personnel arrive at the Site but in any case within two weeks after the Contractor's Personnel arrive at Site and to repeat the HIV Awareness Program at intervals not exceeding four months	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Service Provider to implement training.</li> <li>• Engineer to review program.</li> </ul>
<b>Historical and archaeological areas</b>	Impacts to Historical and archaeological areas	<p>To avoid potential adverse impacts to historic and cultural resources, the Contractor shall:</p> <ul style="list-style-type: none"> <li>• Adhere to accepted international practice and all applicable historic and cultural preservation requirements of the Government of Azerbaijan, including all appropriate local government entities, and</li> <li>• In the event of unanticipated discoveries of cultural or historic artifacts (movable or immovable) in the course of the work, the Contractor shall take all necessary measures to protect the findings and shall notify the Engineer and the Ministry of Culture. If continuation of the work would endanger the finding, project work shall be suspended until a solution for preservation of the artifacts is agreed upon.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Noise</b>	Construction Noise and Vibration	<p>The Contractor shall ensure provision of the following:</p> <ul style="list-style-type: none"> <li>• Source Controls, i.e., requirements that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken;</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors</li> </ul>

**Table 3:**

**BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<ul style="list-style-type: none"> <li>• Site Controls, i.e., requirements that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible;</li> <li>• Work near Sensitive Receptors shall be limited to short term activities;</li> <li>• Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the Engineer having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. When operating close to sensitive areas such as residential, nursery, or medical facilities, the Contractor’s hours of working shall be limited to 8 AM to 6 PM;</li> <li>• Community Awareness, i.e., public notification of construction operations will incorporate noise considerations; methods to handle complaints will be specified. Sensitive receptors will be avoided as possible (i.e., aggregate crushers, operators, etc.). Disposal sites and haul routes will be coordinated with local officials;</li> <li>• Use of low volume charges will reduce the potential for vibration induced damage to structures; and in the event of damage proven to be due to the contractor’s activities, owners of structures will be fully compensated.</li> </ul>	activities.

**Table 4:**

**BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Operational and Maintenance Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
<b>Air Quality</b>	Air quality impacts from Vehicle movements	Potential impacts due to the use of the new bridges and rehabilitated rural roads are the purview of ARS.	<ul style="list-style-type: none"> <li>• ARS to monitor air emissions during the operational phase of the Project</li> </ul>
<b>Soils</b>	Erosion	Contracts stipulated that the Contractor shall be liable for a one year defects liability period. During this year the NRAs should undertake regular observational monitoring of	<ul style="list-style-type: none"> <li>• NRAs to monitor vegetation growth and erosion impacts</li> </ul>

**Table 4:**  
**BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP Operational and Maintenance Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		the Project Road to ensure that engineering works and vegetation growth have prevented erosion impacts. If the NRAs discover any potential issues they shall report their findings to the ARS who shall then make the Contractor responsible for final improvements. Final payments can not be made until outstanding issues are resolved	during defects liability period.

**Table 5**  
**BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP: Pre-construction Phase Instrumental Monitoring**

Issue	Mitigation	Locations	Schedule	Responsibilities	Reporting
Water Quality Impacts due to construction works	The Contractor shall undertake baseline instrumental monitoring during the Pre-construction phase along any water bodies near the construction site. Parameters to be monitored to establish a baseline include: <ul style="list-style-type: none"> <li>Total Suspended Solids (TSS)</li> <li>Biological Oxygen Demand (BOD)</li> <li>Dissolved oxygen (DO)</li> <li>Fecal coliform</li> <li>Oil and grease</li> </ul>	Baseline monitoring locations include: <ul style="list-style-type: none"> <li>50 meters downstream of each borrow pit locations;</li> </ul> In addition, the Engineer may also recommend additional monitoring locations during baseline monitoring and during construction. However, as an indicator the number of sampling locations, including the baseline locations, should not exceed ten.	Water quality baseline monitoring shall be carried out as soon after the date of acceptance of the Bid as practicable to determine ambient levels of the pollutants at the specified monitoring locations which will be identified in the SSEMP.	The Contractor shall engage a third party monitoring agency to undertake the baseline monitoring. The Agency shall be approved by the NRA.	The Agency shall provide his results to the Contractor and Engineer prior to the start of Project works.
Air quality	The Contractor shall undertake baseline instrumental monitoring during the Pre-construction phase. Parameters to be monitored to establish a baseline include: <ul style="list-style-type: none"> <li>Total Suspended Particulates (TSP)</li> <li>Sulfur Dioxide (SO<sub>2</sub>)</li> <li>Nitrogen Dioxide (NO<sub>2</sub>)</li> <li>Carbon Monoxide (CO)</li> </ul>	The recommended baseline monitoring locations include 1 location at each construction site or every 10 Km on rural roads. In addition, the Engineer may also recommend additional monitoring locations during the baseline monitoring. However, as an indicator the number of sampling locations should not exceed ten.	Air quality baseline monitoring shall be carried out as soon after the date of acceptance of the Bid as practicable to determine ambient levels of the air pollutants at the specified monitoring locations which will be identified in the SSEMP.	The Contractor shall engage a third part monitoring agency to undertake the baseline monitoring. The Agency shall be approved by the NRA.	The Agency shall provide his results to the Contractor and Engineer prior to the start of Project works.

**Table 6**  
**BRIDGE No. 1 R-24AGSTAF A-POYIU-SADIQLI: EMP: Construction Phase Instrumental Monitoring**

<b>Issue</b>	<b>Mitigation</b>	<b>Locations</b>	<b>Schedule</b>	<b>Responsibilities</b>	<b>Reporting</b>
<b>Air Quality</b>	The Contractor shall establish routine Air Quality Monitoring throughout the construction period. The following parameters shall be monitored: (TSP), Sulfur Dioxide (SO <sub>2</sub> ), Nitrogen Dioxide (NO <sub>2</sub> ) and Carbon Monoxide (CO). Other parameters may be warranted as and when requested by the Engineer.	At the locations of the baselines monitoring and at any additional locations to be determined by the Engineer (not to exceed ten per monitoring period).	Monitoring to be undertaken once every three months	The Contractor shall hire an independent monitoring consultant to perform the monitoring activities.	The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.
<b>Surface Water Quality</b>	The Contractor shall ensure that routine surface water monitoring is undertaken throughout the construction period. Measured water quality parameters shall include <ul style="list-style-type: none"> <li>• Total Suspended solids (TSS)</li> <li>• Biological Oxygen Demand (BOD)</li> <li>• Dissolved oxygen (DO),</li> <li>• Conductivity - Fecal coliform</li> <li>• Oil and grease</li> </ul>	Locations will be determined in consultation with the Engineer and the NRA and shall include the baseline locations above and any other likely to be subject to water quality impacts or significant runoff (construction camps, staging areas, etc.).	Monitoring to be undertaken bi-monthly	Responsibilities – The Contractor shall hire an independent air quality monitoring consultant.	The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.
<b>Noise</b>	The Contractor shall ensure that routine noise monitoring is undertaken throughout the construction period. Parameters to be monitored to establish a baseline include: Laeq 1h (dBA)	Locations will be determined in consultation with the Engineer and the local NRA	Bi-Monthly throughout construction.	The Contractor shall hire an independent noise monitoring consultant.	The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.



**Annex 4 – EMP for Bridge No. 2**

**Environmental Management Plan**  
**BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000**

**Table 1:**  
**BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Pre-construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
<b>Air Quality</b>	Air quality impacts from stationary sources	Locations for quarry sites, borrow pits and asphalt plants shall require approval from the Engineer and National & Regional Authorities (NRA) during the Pre-construction phase. Efforts should be made to ensure that these facilities are as near to the Project road as practical to avoid unnecessary trips and potential dust issues from vehicle movements during construction works. In addition, no quarry, borrow pit or asphalt plant shall be located within 300 meters of any urban area, protected area or sensitive receptor.	<ul style="list-style-type: none"> <li>• Contractor to select sites</li> <li>• Engineer and NRAs to approve sites.</li> </ul>
<b>Topography</b>	Selection of Quarry Sites	<p>Several potential quarry sites have been identified by AzerRoadService (ARS), although they do not currently have permits. These quarry sites must obtain the required permits prior to commencement of works at these sites. This shall include approval from the NRA and the Engineer. Efforts should be made to ensure that quarries are as near to the site as practical to avoid unnecessary journeys. However, no quarry shall be located within one kilometer of any urban area, protected area or sensitive receptor. The locations of the quarries shall be indicated within the Contractors SSEMP. In addition, Contractors should ensure that quarries and crusher plants are:</p> <ul style="list-style-type: none"> <li>- Located at least 300 meters from residential areas to prevent noise and dust impacts;</li> <li>- Located outside of agricultural land; and</li> <li>- Where possible located on government owned lands.</li> </ul> <p>In addition, alluvial material which will be excavated upstream from blocked culvert areas may be used as base material. This material shall be tested by the Contractor and Engineer for its suitability as base material before it maybe used. A quarry site reinstatement plan should be presented to the Engineer prior to operating quarry sites. Such plan should be implemented prior to the end of the project</p>	<ul style="list-style-type: none"> <li>• Contractor to select quarry sites and apply for approval from NRAs and any other regulatory agencies.</li> <li>• Engineer to review quarry locations, licenses and approvals from ARS and NRA.</li> <li>• Engineer to test suitability of alluvial material.</li> <li>• Engineer to verify and approve the quarry site reinstatement plan</li> </ul>
<b>Hydrology /</b>	Selection of	Due to the sensitivity of the borrow pit locations, the Contractor shall prepare a Borrow	<ul style="list-style-type: none"> <li>• Contractor to select borrow</li> </ul>

<b>Table 1: BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Soils</b>	Borrow Pits	Pit Action Plan (BAP) that should be submitted as part of the SSEMP to the Engineer prior to the start of construction. The plan will identify the locations of all proposed borrow pits. The locations of the borrow pits shall be approved by, the Engineer and ARS, and the NRAs. No borrow pit shall be located within five hundred meters of any protected area. The locations of the borrow pits shall be indicated within the Contractors SSEMP.	<p>sites and apply for approval from NRAs and any other regulatory agencies.</p> <ul style="list-style-type: none"> <li>• Engineer to review borrow locations, licenses and approvals from ARS and NRA.</li> <li>• Engineer to verify and approve the borrow pit reinstatement plan</li> </ul>
	Selection of Asphalt Plant Location	No new asphalt plant shall be located within five hundred meters of any urban area, protected area or sensitive receptor. The locations of the asphalt plants shall be indicated within the Contractors SSEMP. Asphalt plant locations shall be approved by the Engineer, ARS and the NRA.	<ul style="list-style-type: none"> <li>• Contractor to select sites and apply for approval from NRAs and any other regulatory agencies.</li> <li>• Engineer to review locations, licenses and approvals from ARS and NRA.</li> </ul>
	Selection of Construction Camp Site	<p>The Contractor shall be responsible for the preparation of a Construction Camp Site Plan which will form part of the SSEMP. The Plan shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. The Contractor shall ensure the following conditions are met within the Plan:</p> <ul style="list-style-type: none"> <li>• Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.</li> <li>• There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited.</li> <li>• Liquid material storage containment areas shall not drain directly to surface water.</li> <li>• Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.</li> <li>• Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters.</li> </ul>	<ul style="list-style-type: none"> <li>• Engineer to review &amp; approve Site Plan</li> </ul>

**Table 1:  
BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Pre-construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<ul style="list-style-type: none"> <li>• Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.</li> <li>• Spill clean up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage: <ul style="list-style-type: none"> <li>- Fueling operations shall occur only within containment areas.</li> <li>- All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>- Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.</li> <li>- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.</li> <li>- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.</li> <li>- Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized for hazardous waste.</li> </ul> </li> </ul> <p>Site plans shall be devised to ensure that, insofar as possible, all temporary construction facilities are locate at least 50 meters away from a water course, stream, or canal. If determined warranted by the Engineer, the Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor shall ensure that all vehicle are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.</p>	
<b>Soils</b>	Contamination	The Contractor will be responsible for preparation of an Emergency Response Plan	<ul style="list-style-type: none"> <li>• Contractor to prepare ERP</li> </ul>

<b>Table 1: BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
	of Soils	(ERP), which will cover containment of hazardous materials, oil spills, and work-site accidents. The plan will detail the process for handling, and subsequently reporting, emergencies, and specify the organizational structure (including responsibilities of nominated personnel). The plan will be submitted to the Engineer for approval as part of the SSEMP.	<ul style="list-style-type: none"> <li>• Engineer to review and approve ERP as part of the SSEMP</li> </ul>
<b>Air Quality</b>	Air Quality	The Contractor shall be responsible for the preparation of an Air Quality Plan (AQP), submitted to the Engineer prior to commencement of the works. The plan will detail the action to be taken to minimize dust generation (e.g. spraying unsurfaced roads with water, covering stock-piles, and blasting with use of small charges etc) and will identify the type, age and standard of equipment to be used. The Plan shall also include contingencies for the accidental release of toxic air pollutants. The Plan shall be completed during the design phase and shall form part of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to prepare AQP</li> <li>• Engineer to review and approve ERP as part of the SSEMP</li> </ul>
<b>Flora</b>	Vegetation procurement	The Contractor shall be responsible for identifying locations where he may procure specific vegetation for slope stabilization. The vegetation types should include; Elm - <i>Celtis caucasica</i> , Judas-tree, <i>certis – Certis</i> , Senna- <i>Colutea vulgaris</i> & Dog rose - <i>Rosa cocanika</i> . Embankment for bridge approaches should be stabilized as per design and with the use of native grasses and vegetation in conformance with the design.	<ul style="list-style-type: none"> <li>• Contractor to select sites.</li> </ul>
<b>Land Use</b>	Loss of Property and Land	In such circumstances necessary, the ARS must prepare the Land Acquisition and Resettlement Plan (the LARP), obtain the approval of ADB and then implement the plan and acquire the land prior to the start of Pre-construction activities.	<ul style="list-style-type: none"> <li>• ARS to complete LARP (when necessary)</li> <li>• ADB to approve LARP (when necessary)</li> </ul>
<b>Waste and Spoil</b>	Waste Management	The Contractor shall be responsible for preparing a Waste Management Plan (WMP) to manage all excess spoil and waste material. The Plan, which forms part of the SSEMP, shall include items relating to the safe handling and management of: <ul style="list-style-type: none"> <li>• Domestic waste</li> <li>• Food waste</li> <li>• Inert garbage</li> <li>• Recycled Waste</li> <li>• Plastic</li> <li>• Metals</li> <li>• Wood</li> <li>• Construction Waste</li> <li>• Hazardous Waste</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to prepare WMP</li> <li>• Engineer to review and approve WMP as part of the SSEMP</li> </ul>

<b>Table 1: BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<ul style="list-style-type: none"> <li>• Liquid Waste</li> </ul> <p>The Plan will also include provisions to manage all excess spoil material. The Plan should indicate where the spoil will occur and methods and locations for disposal.</p>	
<b>Health and safety</b>	Worker Health and Safety	A Health and Safety Plan (HSP) shall be prepared by the Contractor, as part of the SSEMP, to manage worker safety. The plan shall include an item relating to accidental release of toxic fumes.	<ul style="list-style-type: none"> <li>• Contractor to prepare HSP</li> <li>• Engineer to review and approve HSP as part of the SSEMP</li> </ul>
<b>EMP Requirement</b>	Preparation of SSEMP	<p>The Contractor shall prepare a SSEMP to meet the requirements of this EMP. Specifically the SSEMP shall contain sections relating to:</p> <ul style="list-style-type: none"> <li>• Management of Physical Environment <ul style="list-style-type: none"> <li>- Soils</li> <li>- Water</li> <li>- Air</li> </ul> </li> <li>• Management of Ecological Environmental <ul style="list-style-type: none"> <li>- Flora</li> <li>- Fauna</li> <li>- Protected Areas</li> </ul> </li> <li>• Management of Economic Characteristics <ul style="list-style-type: none"> <li>- Infrastructure</li> <li>- Transport</li> <li>- Land Use</li> <li>- Agriculture</li> </ul> </li> <li>• Management of Social and Cultural Resources <ul style="list-style-type: none"> <li>- Communities, Health and Education Facilities</li> <li>- Historical and Cultural Areas</li> <li>- Noise</li> </ul> </li> </ul> <p>In addition, the SSEMP shall contain specific Management Plans as Annexes relating to the following:</p> <ul style="list-style-type: none"> <li>• Borrow Pit Management Plan</li> <li>• Air Quality Management Plan</li> <li>• Water Quality Management Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to prepare SSEMP</li> <li>• Engineer to review and approve SSEMP</li> </ul>

<b>Table 1: BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<ul style="list-style-type: none"> <li>Noise Management Plan</li> <li>Waste Management Plan</li> <li>Emergency Response Plan</li> <li>Dust Suppression Plan</li> <li>Site Plan</li> <li>Health and Safety Plan</li> </ul> <p>Each section shall describe the precise location of the required mitigation / monitoring, the persons responsible for the mitigation / monitoring, the schedule and reporting methodology. The SSEMP must be submitted within 30 days of the contract award and construction cannot commence until the SSEMPs are approved by the ARS and the Engineer.</p>	
	Incorporation of Items into Bid Documents	The Contractor shall be responsible for ensuring compliance with this EMP. A specific environmental section shall be included within the main Bid Documents indicating that the Contractor shall be responsible for conforming to the requirements of the EMP. As such this EMP shall be included as an annex to the Contract Bid Documents.	<ul style="list-style-type: none"> <li>ARS to ensure EMP is included within Bid Documents</li> </ul>

<b>Table 2: BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Detailed Design Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Soils</b>	Soil Erosion	<ul style="list-style-type: none"> <li>To reduce the impacts of erosion, the Contractors Detailed Designs shall ensure:</li> <li>The side slopes of embankments will be designed to reflect soil strength and other considerations as included in the project specifications in order to reduce slips or erosion;</li> <li>For embankments greater than 6m, stepped embankments will be used;</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to include mitigations in his detailed design.</li> <li>Engineer to review and approve design documents.</li> </ul>
<b>Geology and Seismic Conditions</b>	Seismic Issues	The seismic characteristics of the potentially affected area shall be taken into account during the Detailed Design phase of the Project. Earthquake loading shall be applied to the design of structures, including bridges, to ensure that seismic events do not have negative impacts during the operational phase of the Project.	<ul style="list-style-type: none"> <li>Contractor to include mitigations in his detailed design.</li> <li>Engineer to review and approve design documents.</li> </ul>

<b>Table 2: BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Detailed Design Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Hydrology</b>	Drainage	Consideration in the design phase will be given to the issue of drainage and culverts to ensure that drainage patterns are improved from the existing conditions and that increased run-off does not occur or result in flooding of areas previously undisturbed. During design, the Contractor shall ensure that all drainage works are designed based on the historical flood data and flood forecasting. A design discharge of 50 years return period is considered for culverts, and 100 years of bridges. The design of all structural components must conform to the design standards provided in the Employer's Special Requirements.	<ul style="list-style-type: none"> <li>• Engineer to review and approve design documents.</li> </ul>
	Drilling of Boreholes	The Contractor shall ensure that all required permits have been gathered prior to the excavation of any borehole.	<ul style="list-style-type: none"> <li>• Contractor to gather permits</li> <li>• Engineer to review permits prior to excavation works commencement.</li> </ul>
	Bridge Construction	All new and widened bridges must be designed for the life expectancy of 75 years. The bridge rehabilitation and strengthening works must be designed for the life expectancy of 50 years. The design loading and design of all structural components must conform to the bridge design standards provided in the Employer's Special Requirements. Finally, the bridge design and layout must be aesthetically pleasing and in harmony with the existing environment.	<ul style="list-style-type: none"> <li>• Engineer to review and approve design documents.</li> </ul>
<b>Historical and Archaeological Sites</b>	Impacts to Historical and Archaeological Sites	Designs shall ensure that there is no significant encroachment to any historical or archaeological site eventually discovered during Detailed Design.	<ul style="list-style-type: none"> <li>• Contractor to include mitigations in his detailed design.</li> <li>• Engineer to review and approve design documents.</li> </ul>
<b>Flora</b>	Loss of Trees	During Detailed Design the Contractor shall ensure that roadside activities such as asphalt plants, construction camps and other ancillary features are properly sited as agreed with the relevant CEP. The Contractor should avoid loss of trees where possible and should employ techniques such as asymmetrical widening. Where trees must be felled, the Contractor shall ensure that each one removed should be replaced by at least two new saplings of the same species or other at suitable locations, all as designated by the tree owner,	<ul style="list-style-type: none"> <li>• Contractor to include mitigations in his detailed design.</li> <li>• Engineer to review and approve design documents.</li> <li>• Contractor to replace trees during Construction with oversight from the Engineer.</li> </ul>
<b>Health and Safety</b>	Safety	The Contractor shall ensure that traffic safety issues shall be accounted for during the design phase of the Project, they including incorporation of:	<ul style="list-style-type: none"> <li>• Engineer to review and approve design documents.</li> </ul>

<b>Table 2: BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Detailed Design Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<ul style="list-style-type: none"> <li>• Safety barriers</li> <li>• Traffic signs</li> <li>• Road Crossings</li> <li>• Speed Bumps</li> <li>• Speed limits</li> </ul>	

<b>Table 3: BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Air Quality</b>	Open burning of waste materials	The Contractor shall ensure no burning of debris or other materials will occur on the Site without permission of the Engineer.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Fuel Emissions	Contractor shall ensure that no furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the Engineer.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Exhaust emissions from the operation of construction machinery	<p>The Contractor shall ensure construction equipment shall be maintained to a good standard and fitted with pollution control devices. The equipment (including the pollution control devices) will be checked at regular intervals by the Engineer to ensure they are maintained in working order and the inspection result will be recorded by the Contractor &amp; Engineer as part of environmental monitoring. In addition, the Contractor shall:</p> <ul style="list-style-type: none"> <li>• Discourage of the idling of engines;</li> <li>• Prohibit of the use of equipment and machinery that causes excessive pollution (i.e. visible smoke) at project work sites;</li> </ul> <p>Ensure material stockpiles being located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne.</p>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>



**Table 3:  
BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
	Fugitive emissions from quarries and asphalt plants.	The Contractor shall ensure that conveyor belts at ancillary facilities (e.g. quarries) shall be fitted with wind-boards, and conveyor transfer points and hopper discharge areas shall be enclosed to minimize dust emission. All conveyors carrying materials that have the potential to create dust shall be totally enclosed and fitted with belt cleaners.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Dust generated from haul roads, unpaved roads, exposed soils and material stock piles.	<p>The Contractor shall ensure that the following dust suppression measures shall be instituted:</p> <ul style="list-style-type: none"> <li>• All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s);</li> <li>• Areas of reclamation shall be completed, including final compaction, as quickly as possible consistent with good practice to limit the creation of wind blown dust.</li> <li>• Hard surfaces will be required in areas with regular movements of vehicles; and</li> <li>• Effective use of water sprays will be implemented (e.g., all roads within the construction areas of the Site shall be sprayed at least twice each day, and more if necessary to control dust to the satisfaction of the Engineer).</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Topography</b>	Cut and Fill Requirement	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>• Temporary and permanent storage of materials should be confined to government owned land and in no circumstances should be dumped on agricultural or productive lands or to any watercourse including irrigation channels.</li> <li>• In the event of any spoil or debris from construction works being deposited in any of the afore mentioned areas or any silt washed down to any area, then all such spoil, debris or material and silt shall be immediately removed and the affected land and areas restored to their natural state by the Contractor to the satisfaction of the Engineer.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> <li>• Approvals for waste disposal sites to be sought from the NRA by the Contractor.</li> </ul>
	Slope Stabilization	<p>The Contractor shall be responsible for the following:</p> <ul style="list-style-type: none"> <li>• Final forming and re-vegetation will be completed by the Contractor as soon as possible following fill placement to facilitate regeneration of a stabilizing ground cover.</li> <li>• Trenching will be used where necessary to ensure successful establishment of vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

**Table 3:  
BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<ul style="list-style-type: none"> <li>Seeding with a fast growing crop and native seed mix (see <b>Specifications for list of species</b>) will occur immediately after fill placement to prevent scour and to encourage stabilization;</li> <li>Construction in erosion and flood-prone areas will be restricted to the dry season.</li> </ul>	
	Quarries	<p>If licensed quarries are not available the Contractor may be made responsible for setting up their dedicated quarries. Prior to opening of any quarry or rock crushing facility, the Contractor will require approval from the relevant NRA and the Engineer to ensure that land owners are adequately compensated for land use and that the sites are not located in an area likely to cause significant detriment to the local environment. To ensure that this is the case Contractors should ensure that quarries and crusher plants are:</p> <ul style="list-style-type: none"> <li>Located at least 300 meters from urban areas to prevent noise and dust impacts;</li> <li>Located outside of agricultural land; and</li> <li>Where possible located on government owned lands.</li> <li>Quarry area should be reinstated prior to the completion of the project.</li> </ul>	<ul style="list-style-type: none"> <li>NRA to approve locations.</li> <li>Contractor to obtain necessary permits.</li> <li>Engineer to review permits and approvals prior to the opening of the site.</li> <li>Engineer to inspect the reinstatement work on the quarry area by the Contractor</li> </ul>
		<p>Alluvial material which will be excavated upstream from blocked culvert areas may be used as base material. This material shall be tested by the Contractor and Engineer for its suitability as base material before it maybe used. The Contractor must use such material first before using any other quarry or borrow pit within 3 km from any such alluvial deposit.</p>	<ul style="list-style-type: none"> <li>Engineer to test material before use as base material.</li> </ul>
	Borrow Pits.	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>Pit restoration will follow the completion of works in full compliance all applicable standards and specifications.</li> <li>Arrangements for opening and using material borrow pits will contain enforceable provisions.</li> <li>The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Engineer will be required before final acceptance and payment under the terms of contracts.</li> <li>Additional borrow pits will not be opened without the restoration of those areas no longer in use.</li> <li>Borrow pits should be reinstated prior to completion of the Project</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> <li>Engineer to inspect the reinstatement work on the borrow pit by the Contractor</li> </ul>
<b>Soils</b>	Loss of Land for	The Engineer shall ensure that all appropriate LARP measures have been taken by the ARS before any alteration or destruction of agricultural land by the Contractor.	<ul style="list-style-type: none"> <li>Engineer to coordinate with ARS &amp; Contractor.</li> </ul>

**Table 3:**  
**BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
	Agricultural Production		
	Erosion	<p>The Contractor will be responsible for ensuing:</p> <ul style="list-style-type: none"> <li>• Material that is less susceptible to erosion will be selected for placement around bridges and culverts.</li> <li>• Re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local flora (see <b>Specifications</b>); (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth, although due to the arid conditions in most of the road, this may only be feasible where there is regular rainfall or other natural water supply.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Contamination due to Spills or Hazardous Materials	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>• All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>• The construction camp maintenance yard shall be constructed on impervious Layer with adequate drainage to collect spills, there shall be no vehicle maintenance activities on open ground.</li> <li>• Filling and refueling shall be strictly controlled and subject to formal procedures. Drip pans shall be placed under all filling and fueling areas. Waste oils shall be stored and disposed of by a licensed contractor.</li> <li>• All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>• The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any soils.</li> <li>• No bitumen drums or containers, full or used, shall be stored on open ground. They shall only be stored on impervious Layer.</li> <li>• Areas using bitumen shall be constructed on impervious Layer to prevent seepage of oils into the soils.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Hydrology</b>	Drainage and Flooding	<p>The Contractor shall ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>• During the construction phase the Contractor is required to construct, maintain,</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> </ul>

**Table 3:  
BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<p>remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works.</p> <ul style="list-style-type: none"> <li>• The Contractor shall arrange with the village representatives those works which might interfere with the flow of irrigation waters to be carried out at such times as will cause the least disturbance to irrigation operations.</li> <li>• Should any operation being performed by the Contractor interrupt existing irrigation facilities, the Contractor shall restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption.</li> </ul>	<ul style="list-style-type: none"> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	<p>Construction Camps and Storage Areas</p>	<p>The Contractor shall ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.</li> <li>• There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited.</li> <li>• Liquid material storage containment areas shall not drain directly to surface water.</li> <li>• Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.</li> <li>• Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters.</li> <li>• Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.</li> <li>• Spill clean up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage: <ul style="list-style-type: none"> <li>- Fueling operations shall occur only within containment areas.</li> <li>- All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>- Filling and refueling shall be strictly controlled and subject to formal procedures</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

**Table 3:  
BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<p>and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.</p> <ul style="list-style-type: none"> <li>- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.</li> <li>- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.</li> <li>- Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized for hazardous waste.</li> </ul> <ul style="list-style-type: none"> <li>• If determined warranted by the Engineer, the Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor shall ensure that all vehicle are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.</li> </ul>	
	Bridge Construction	<p>The Contractor shall consult with the local NRA to establish the fish spawning period in relation to the bridge construction works. The Contractor shall ensure that all works are undertaken in periods least likely to affect the fish spawning period. In addition, concerning bridge construction works, the Contractor shall:</p> <ul style="list-style-type: none"> <li>• Divert the water flow near the bridge piers.</li> <li>• Cofferdams, silt fences, sediment barriers or other devices will be provided to prevent migration of silt during construction within streams.</li> <li>• Dewatering and cleaning of cofferdams will be performed to prevent siltation by pumping from cofferdams to a settling basin or a containment unit.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Contractor to consult with NRA.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
Flora and Fauna	Loss of flora	<p>The Contractor shall ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Each tree removed by the Contractor should be replaced by at least two new saplings of the same species or other at suitable locations, all as designated by the tree owner.</li> <li>• Supplying appropriate and adequate fuel in workers' camps to prevent fuel-wood</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

**Table 3:  
BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
	Affected flora and fauna	<p>collection from unauthorized sources.</p> <ul style="list-style-type: none"> <li>The Contractor shall record any affected trees and submit a detailed report to the Engineer.</li> <li>Once any endemic animals are discovered at the site, the Contractor should ensure that such animals are not harmed and allowed to escape. Any breeding place should be left undisturbed. Contractor should issue strict instructions to workers not to harm endemic animals or breeding places of endemic species.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor should provide accurate list of affected trees at the site.</li> <li>Contractor to issue strict instruction to workers against harming endemic species or their habitats.</li> </ul>
	Protected Areas	The opening of additional borrow pits shall require the Contractor to receive the approval of the Environmental Agency and the Engineer to ensure there are no detrimental impacts to protected areas.	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
	<b>Land Use</b> Construction Camps and other ancillary facilities	The Contractor will be required to coordinate all construction camp activities with neighbouring land uses. The Contractor shall also be responsible to maintain and cleanup campsites and respect the rights of local landowners. If located outside the RoW, written agreements with local landowners for temporary use of the property will be required and sites must be restored to a level acceptable to the owner within predetermined time period.	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Transport and Infrastructure</b>	Road closures, existing bridge closure, diversions and blocking of access routes	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>He shall be responsible for provision of all road diversion signs and ensure that diversion roads do not impact negatively upon private lands.</li> <li>Any diversions shall be agreed upon by the Engineer.</li> <li>Notices of delays, due to blasting (if any), shall be posted in villages within ten kilometers of the blasting area so villagers can plan their travel times accordingly.</li> <li>The Contractor should make blasting at a regular period in the day so that the population in the valley becomes aware of the most likely delay periods.</li> <li>The Contractor shall be responsible for ensuring that all access routes are kept open during Project works for at least 50% of the day during construction works and 100% of the time after construction works are completed for the day. Any temporary existing bridge closure should be communicated to affected people ahead of time</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> <li>Contractor to provide plan for any existing bridge closure</li> </ul>
	Electrical	During construction the Contractor shall ensure that all power lines be kept operational,	<ul style="list-style-type: none"> <li>Contractor to implement</li> </ul>

**Table 3:  
BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
	Systems	this may include the provision of temporary transmission lines while existing poles and lines are moved. The only exception to this item will be during periods of blasting when HV power lines will be switched off for safety.	mitigation <ul style="list-style-type: none"> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Waste and Spoil</b>	Spoil	Under no circumstances shall the Contractor dump excess materials on private lands without permission of the owner and approval from the Engineer. In addition, excess spoil shall not be dumped or pushed into rivers at any location unless in low volumes and agreed upon with the Engineer and with approval from the NRA.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• NRA to approve any waste disposal to the River.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Inert Solid & Liquid waste	The contractor shall be responsible for the following: <ul style="list-style-type: none"> <li>• Provide refuse containers at each worksite;</li> <li>• Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all wastes before transportation and final disposal;</li> <li>• Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process, and</li> <li>• Collect and transport non-hazardous wastes to all approved disposal sites. The sites for waste disposal shall be agreed with the local municipal authorities and NRA. A specialized company may be contracted, if available to ensure collection of domestic and general waste from camps and temporary storage areas and transportation to landfills approved and licensed by the NRA.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• NRA to approve any waste disposal site.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Asphalt	It is recommended that discussions are undertaken with ARS to determine if it is feasible to re-process the asphalt for use on other local roads throughout the region. If it is determined to be cost effective, the Project should consider procuring equipment for this purpose.	<ul style="list-style-type: none"> <li>• ARS to assess feasibility.</li> </ul>
	Hazardous Waste	Management, handling & storage protocols for hazardous waste will be outlined in the Contractors Waste Management Plan. Disposal locations of hazardous wastes should be agreed with the NRA. The Contractor shall collect hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment or disposal at the temporary storage sites and further at the locations approved by NRA or pass it to the licensed	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• NRA to approve any waste disposal site.</li> <li>• Engineer to routinely</li> </ul>

**Table 3:**

**BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		operator having environmental permit on operation of the hazardous wastes.	monitor Contractors activities.
<b>Health and Safety</b>	Worker Health & safety	<p>The Contractor shall be responsible for provision of:</p> <ul style="list-style-type: none"> <li>• Safety Training Program. A Safety Training Program is required and shall consist of an Initial Safety Induction Course. All workmen shall be required to attend a safety induction course within their first week on Site and Periodic Safety Training Courses.</li> <li>• Safety Meetings. Regular safety meetings will be conducted on a monthly basis and shall require attendance by the safety representatives of Subcontractors unless otherwise agreed by the Engineer.</li> <li>• Safety Inspections. The Contractor shall regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. Lights and signs shall be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately.</li> <li>• Safety Equipment and Clothing. Safety equipment and protective clothing are required to be available on the Site at all material times and measures for the effective enforcement of proper utilization and necessary replacement of such equipment and clothing, and all construction plant and equipment used on or around the Site shall be fitted with appropriate safety devices.</li> <li>• First Aid facilities. A fully equipped first aid base shall be climatically controlled to maintain the temperature of the inside of the building at 20 degrees C. Arrangements for emergency medical services shall be made to the satisfaction of the Engineer.</li> </ul> <p>The Contractor shall coordinate with local public health officials and shall reach a documented understanding with regard to the use of hospitals and other community facilities.</p>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>



**Table 3:  
BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
	Sub-contractor H&S	All sub-contractors will be supplied with copies of the SSEMP. Provisions will be incorporated into all sub-contracts to ensure the compliance with the SSEMP at all tiers of the sub-contracting. All sub-contractors will be required to appoint a safety representative who shall be available on the Site throughout the operational period of the respective sub-contract unless the Engineers approval to the contrary is given in writing. In the event of the Engineers approval being given, the Engineer, without prejudice to their other duties and responsibilities, shall ensure, as far as is practically possible, that employees of subcontractors of all tiers are conversant with appropriate parts of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors and sub-contractors activities.</li> </ul>
	HIV / AIDS	The Contractor shall subcontract with an Approved Service Provider to provide an HIV Awareness Program to the Contractor’s Personnel and the Local Community as soon as practicable after the Contractor’s Personnel arrive at the Site but in any case within two weeks after the Contractor’s Personnel arrive at Site and to repeat the HIV Awareness Program at intervals not exceeding four months	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Service Provider to implement training.</li> <li>• Engineer to review program.</li> </ul>
<b>Historical and archaeological areas</b>	Impacts to Historical and archaeological areas	To avoid potential adverse impacts to historic and cultural resources, the Contractor shall: <ul style="list-style-type: none"> <li>• Adhere to accepted international practice and all applicable historic and cultural preservation requirements of the Government of Azerbaijan, including all appropriate local government entities, and</li> <li>• In the event of unanticipated discoveries of cultural or historic artifacts (movable or immovable) in the course of the work, the Contractor shall take all necessary measures to protect the findings and shall notify the Engineer and the Ministry of Culture. If continuation of the work would endanger the finding, project work shall be suspended until a solution for preservation of the artifacts is agreed upon.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Noise</b>	Construction Noise and Vibration	The Contractor shall ensure provision of the following: <ul style="list-style-type: none"> <li>• Source Controls, i.e., requirements that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken;</li> <li>• Site Controls, i.e., requirements that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible;</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

**Table 3:**

**BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<ul style="list-style-type: none"> <li>• Work near Sensitive Receptors shall be limited to short term activities;</li> <li>• Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the Engineer having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. When operating close to sensitive areas such as residential, nursery, or medical facilities, the Contractor’s hours of working shall be limited to 8 AM to 6 PM;</li> <li>• Community Awareness, i.e., public notification of construction operations will incorporate noise considerations; methods to handle complaints will be specified. Sensitive receptors will be avoided as possible (i.e., aggregate crushers, operators, etc.). Disposal sites and haul routes will be coordinated with local officials;</li> <li>• Use of low volume charges will reduce the potential for vibration induced damage to structures; and in the event of damage proven to be due to the contractor’s activities, owners of structures will be fully compensated.</li> </ul>	

**Table 4:**

**BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Operational and Maintenance Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
<b>Air Quality</b>	Air quality impacts from Vehicle movements	Potential impacts due to the use of the new bridges and rehabilitated rural roads are the purview of ARS.	<ul style="list-style-type: none"> <li>• ARS to monitor air emissions during the operational phase of the Project</li> </ul>
<b>Soils</b>	Erosion	Contracts stipulated that the Contractor shall be liable for a one year defects liability period. During this year the NRAs should undertake regular observational monitoring of the Project Road to ensure that engineering works and vegetation growth have prevented erosion impacts. If the NRAs discover any potential issues they shall report their findings to the ARS who shall then make the Contractor responsible for final	<ul style="list-style-type: none"> <li>• NRAs to monitor vegetation growth and erosion impacts during defects liability period.</li> </ul>

**Table 4:**

**BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP Operational and Maintenance Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		improvements. Final payments can not be made until outstanding issues are resolved	
<b>Hydrology</b>	Impacts to hydrology and water quality) as a result of construction activities.	Contracts stipulated that the Contractor shall be liable for a one year defects liability period. During this year the locals NRAs should undertake regular water quality monitoring and routine observational monitoring of construction areas close to the 3 Rivers affected and its tributaries to ensure that the road works are not having any continuous impacts upon the hydrological conditions of the region. If the NRAs discover any potential issues they shall report their findings to the ARS who shall then make the Contractor responsible for final improvements. Final payments can not be made until outstanding issues are resolved.	<ul style="list-style-type: none"> <li>NRAs to monitor water quality during defects liability period.</li> </ul>

**Table 5**

**BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP: Pre-construction Phase Instrumental Monitoring**

Issue	Mitigation	Locations	Schedule	Responsibilities	Reporting
Water Quality Impacts due to construction works	The Contractor shall undertake baseline instrumental monitoring during the Pre-construction phase. Parameters to be monitored to establish a baseline include: <ul style="list-style-type: none"> <li>Total Suspended Solids (TSS)</li> <li>Biological Oxygen Demand (BOD)</li> <li>Dissolved oxygen (DO)</li> <li>Fecal coliform</li> <li>Oil and grease</li> </ul>	Baseline monitoring locations include: <ul style="list-style-type: none"> <li>50 meters down stream of each borrow pit locations;</li> <li>50 meters downstream of the Kur River Bridge.</li> </ul> In addition, the Engineer may also recommend additional monitoring locations during baseline monitoring and during construction. However, as an indicator the number of sampling locations, including the baseline locations, should not exceed ten.	Water quality baseline monitoring shall be carried out as soon after the date of acceptance of the Bid as practicable to determine ambient levels of the pollutants at the specified monitoring locations which will be identified in the SSEMP.	The Contractor shall engage a third party monitoring agency to undertake the baseline monitoring. The Agency shall be approved by the NRA.	The Agency shall provide his results to the Contractor and Engineer prior to the start of Project works.
Air quality	The Contractor shall undertake baseline instrumental monitoring during the Pre-construction phase. Parameters to be monitored to	The recommended baseline monitoring locations include 1 location at each construction site or every 10 Km on rural roads.	Air quality baseline monitoring shall be carried out as soon after the date of	The Contractor shall engage a third part monitoring	The Agency shall provide his results to the Contractor and

**Table 5**

**BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP: Pre-construction Phase Instrumental Monitoring**

Issue	Mitigation	Locations	Schedule	Responsibilities	Reporting
	establish a baseline include: <ul style="list-style-type: none"> <li>• Total Suspended Particulates (TSP)</li> <li>• Sulfur Dioxide (SO<sub>2</sub>)</li> <li>• Nitrogen Dioxide (NO<sub>2</sub>)</li> <li>• Carbon Monoxide (CO)</li> </ul>	In addition, the Engineer may also recommend additional monitoring locations during the baseline monitoring. However, as an indicator the number of sampling locations should not exceed ten.	acceptance of the Bid as practicable to determine ambient levels of the air pollutants at the specified monitoring locations which will be identified in the SSEMP.	agency to undertake the baseline monitoring. The Agency shall be approved by the NRA.	Engineer prior to the start of Project works.

**Table 6**

**BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP: Construction Phase Instrumental Monitoring**

Issue	Mitigation	Locations	Schedule	Responsibilities	Reporting
<b>Air Quality</b>	The Contractor shall establish routine Air Quality Monitoring throughout the construction period. The following parameters shall be monitored: (TSP), Sulfur Dioxide (SO <sub>2</sub> ), Nitrogen Dioxide (NO <sub>2</sub> ) and Carbon Monoxide (CO). Other parameters maybe warranted as and when requested by the Engineer.	At the locations of the baselines monitoring and at any additional locations to be determined by the Engineer (not to exceed ten per monitoring period).	Monitoring to be undertaken once every three months	The Contractor shall hire an independent monitoring consultant to perform the monitoring activities.	The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.
<b>Surface Water Quality</b>	The Contractor shall ensure that routine surface water monitoring is undertaken throughout the construction period. Measured water quality parameters shall include <ul style="list-style-type: none"> <li>• Total Suspended solids (TSS)</li> <li>• Biological Oxygen Demand (BOD)</li> <li>• Dissolved oxygen (DO),</li> <li>• Conductivity - Fecal coliform</li> </ul>	Locations will be determined in consultation with the Engineer and the NRA and shall include the baseline locations above and any other likely to be subject to water quality impacts or significant runoff (construction camps, staging areas, etc.).	Monitoring to be undertaken bi-monthly	Responsibilities – The Contractor shall hire an independent air quality monitoring consultant.	The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.

**Table 6**

**BRIDGE No. 2, R-24, POYLU – SADIQLI ROAD; KM 17+000: EMP: Construction Phase Instrumental Monitoring**

Issue	Mitigation	Locations	Schedule	Responsibilities	Reporting
	<ul style="list-style-type: none"> <li>• Oil and grease</li> </ul>				
<b>Noise</b>	<p>The Contractor shall ensure that routine noise monitoring is undertaken throughout the construction period. Parameters to be monitored to establish a baseline include:  Laeq 1h (dBA)</p>	<p>Locations will be determined in consultation with the Engineer and the local NRA</p>	<p>Bi-Monthly throughout construction.</p>	<p>The Contractor shall hire an independent noise monitoring consultant.</p>	<p>The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.</p>

**Annex 5– EMP for Bridge No. 3**

**Environmental Management Plan**  
**BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500**

**Table 1:**

**BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Pre-construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
<b>Air Quality</b>	Air quality impacts from stationary sources	Locations for quarry sites, borrow pits and asphalt plants shall require approval from the Engineer and National & Regional Authorities (NRA) during the Pre-construction phase. Efforts should be made to ensure that these facilities are as near to the Project road as practical to avoid unnecessary trips and potential dust issues from vehicle movements during construction works. In addition, no quarry, borrow pit or asphalt plant shall be located within 300 meters of any urban area, protected area or sensitive receptor.	<ul style="list-style-type: none"> <li>• Contractor to select sites</li> <li>• Engineer and NRAs to approve sites.</li> </ul>
<b>Topography</b>	Selection of Quarry Sites	<p>Several potential quarry sites have been identified by AzerRoadService (ARS), although they do not currently have permits. These quarry sites must obtain the required permits prior to commencement of works at these sites. This shall include approval from the NRA and the Engineer. Efforts should be made to ensure that quarries are as near to the site as practical to avoid unnecessary journeys. However, no quarry shall be located within one kilometer of any urban area, protected area or sensitive receptor. The locations of the quarries shall be indicated within the Contractors SSEMP. In addition, Contractors should ensure that quarries and crusher plants are:</p> <ul style="list-style-type: none"> <li>- Located at least 300 meters from residential areas to prevent noise and dust impacts;</li> <li>- Located outside of agricultural land; and</li> <li>- Where possible located on government owned lands.</li> </ul> <p>In addition, alluvial material which will be excavated upstream from blocked culvert areas may be used as base material. This material shall be tested by the Contractor and Engineer for its suitability as base material before it maybe used. A quarry site reinstatement plan should be presented to the Engineer prior to operating quarry sites. Such plan should be implemented</p>	<ul style="list-style-type: none"> <li>• Contractor to select quarry sites and apply for approval from NRAs and any other regulatory agencies.</li> <li>• Engineer to review quarry locations, licenses and approvals from ARS and NRA.</li> <li>• Engineer to test suitability of alluvial material.</li> <li>• Engineer to verify and approve the quarry site reinstatement plan</li> </ul>

<b>Table 1: BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Pre-construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		prior to the end of the project	
<b>Hydrology / Soils</b>	Selection of Borrow Pits	Due to the sensitivity of the borrow pit locations, the Contractor shall prepare a Borrow Pit Action Plan (BAP) that should be submitted as part of the SSEMP to the Engineer prior to the start of construction. The plan will identify the locations of all proposed borrow pits. The locations of the borrow pits shall be approved by both, the Engineer and ARS, and the NRAs. No borrow pit shall be located within five hundred meters of any protected area. The locations of the borrow pits shall be indicated within the Contractors SSEMP. In addition, the Contractor should present a borrow pit reinstatement plan.	<ul style="list-style-type: none"> <li>• Contractor to select borrow sites and apply for approval from NRAs and any other regulatory agencies.</li> <li>• Engineer to review borrow locations, licenses and approvals from ARS and NRA.</li> <li>• Engineer to verify and approve the borrow pit reinstatement plan</li> </ul>
	Selection of Asphalt Plant Location	No new asphalt plant shall be located within five hundred meters of any urban area, protected area or sensitive receptor. The locations of the asphalt plants shall be indicated within the Contractors SSEMP. Asphalt plant locations shall be approved by the Engineer, ARS and the NRA.	<ul style="list-style-type: none"> <li>• Contractor to select sites and apply for approval from NRAs and any other regulatory agencies.</li> <li>• Engineer to review locations, licenses and approvals from ARS and NRA.</li> </ul>
	Selection of Construction Camp Site	<p>The Contractor shall be responsible for the preparation of a Construction Camp Site Plan which will form part of the SSEMP. The Plan shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. The Contractor shall ensure the following conditions are met within the Plan:</p> <ul style="list-style-type: none"> <li>• Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.</li> <li>• There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited.</li> <li>• Liquid material storage containment areas shall not drain directly to surface water.</li> <li>• Lubricating and fuel oil spills shall be cleaned up immediately and spill</li> </ul>	<ul style="list-style-type: none"> <li>• Engineer to review &amp; approve Site Plan</li> </ul>

**Table 1:  
 BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Pre-construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<p>clean-up shall be materials be maintained at the storage area.</p> <ul style="list-style-type: none"> <li>• Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters.</li> <li>• Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.</li> <li>• Spill clean up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage:                             <ul style="list-style-type: none"> <li>- Fueling operations shall occur only within containment areas.</li> <li>- All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>- Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.</li> <li>- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.</li> <li>- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.</li> <li>- Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized for hazardous waste.</li> </ul> </li> </ul> <p>Site plans shall be devised to ensure that, insofar as possible, all temporary construction facilities are locate at least 50 meters away from a water course, stream, or canal. If determined warranted by the Engineer, the Contractor shall provide a wash pit or a wheel washing and/or vehicle</p>	



<b>Table 1:</b>			
<b>BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Pre-construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		cleaning facility at the exits from the sites. If so requested, the Contractor shall ensure that all vehicle are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.	
<b>Soils</b>	Contamination of Soils	The Contractor will be responsible for preparation of an Emergency Response Plan (ERP), which will cover containment of hazardous materials, oil spills, and work-site accidents. The plan will detail the process for handling, and subsequently reporting, emergencies, and specify the organizational structure (including responsibilities of nominated personnel). The plan will be submitted to the Engineer for approval as part of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to prepare ERP</li> <li>• Engineer to review and approve ERP as part of the SSEMP</li> </ul>
<b>Air Quality</b>	Air Quality	The Contractor shall be responsible for the preparation of an Air Quality Plan (AQP), submitted to the Engineer prior to commencement of the works. The plan will detail the action to be taken to minimize dust generation (e.g. spraying unsurfaced roads with water, covering stock-piles, and blasting with use of small charges etc) and will identify the type, age and standard of equipment to be used. The Plan shall also include contingencies for the accidental release of toxic air pollutants. The Plan shall be completed during the design phase and shall form part of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to prepare AQP</li> <li>• Engineer to review and approve ERP as part of the SSEMP</li> </ul>
<b>Flora</b>	Vegetation procurement	The Contractor shall be responsible for identifying locations where he may procure specific vegetation for slope stabilization. The vegetation types should include; Elm - Celtis caucasica, Judas-tree, certis – Certis, Senna-Colutea vulgaris & Dog rose - Rosa cocanika. Embankment for bridge approaches should be stabilized as per design and with the use of native grasses and vegetation in conformance with the design.	<ul style="list-style-type: none"> <li>• Contractor to select sites.</li> </ul>
<b>Land Use</b>	Loss of Property and Land	In such circumstances necessary, the ARS must prepare the Land Acquisition and Resettlement Plan (the LARP), obtain the approval of ADB and then implement the plan and acquire the land prior to the start of Pre-construction activities.	<ul style="list-style-type: none"> <li>• ARS to complete LARP (when necessary)</li> <li>• ADB to approve LARP (when necessary)</li> </ul>
<b>Waste and</b>	Waste	The Contractor shall be responsible for preparing a Waste Management	<ul style="list-style-type: none"> <li>• Contractor to prepare WMP</li> </ul>

<b>Table 1:</b>			
<b>BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Spoil</b>	Management	<p>Plan (WMP) to manage all excess spoil and waste material. The Plan, which forms part of the SSEMP, shall include items relating to the safe handling and management of:</p> <ul style="list-style-type: none"> <li>• Domestic waste</li> <li>• Food waste</li> <li>• Inert garbage</li> <li>• Recycled Waste</li> <li>• Plastic</li> <li>• Metals</li> <li>• Wood</li> <li>• Construction Waste</li> <li>• Hazardous Waste</li> <li>• Liquid Waste</li> </ul> <p>The Plan will also include provisions to manage all excess spoil material. The Plan should indicate where the spoil will occur and methods and locations for disposal.</p>	<ul style="list-style-type: none"> <li>• Engineer to review and approve WMP as part of the SSEMP</li> </ul>
<b>Health and safety</b>	Worker Health and Safety	<p>A Health and Safety Plan (HSP) shall be prepared by the Contractor, as part of the SSEMP, to manage worker safety. The plan shall include an item relating to accidental release of toxic fumes.</p>	<ul style="list-style-type: none"> <li>• Contractor to prepare HSP</li> <li>• Engineer to review and approve HSP as part of the SSEMP</li> </ul>
<b>EMP Requirement</b>	Preparation of SSEMP	<p>The Contractor shall prepare a SSEMP to meet the requirements of this EMP. Specifically the SSEMP shall contain sections relating to:</p> <ul style="list-style-type: none"> <li>• Management of Physical Environment <ul style="list-style-type: none"> <li>- Soils</li> <li>- Water</li> <li>- Air</li> </ul> </li> <li>• Management of Ecological Environmental <ul style="list-style-type: none"> <li>- Flora</li> <li>- Fauna</li> <li>- Protected Areas</li> </ul> </li> <li>• Management of Economic Characteristics <ul style="list-style-type: none"> <li>- Infrastructure</li> <li>- Transport</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to prepare SSEMP</li> <li>• Engineer to review and approve SSEMP</li> </ul>

<b>Table 1:</b>			
<b>BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Pre-construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<ul style="list-style-type: none"> <li>- Land Use</li> <li>- Agriculture</li> <li>• Management of Social and Cultural Resources <ul style="list-style-type: none"> <li>- Communities, Health and Education Facilities</li> <li>- Historical and Cultural Areas</li> <li>- Noise</li> </ul> </li> </ul> <p>In addition, the SSEMP shall contain specific Management Plans as Annexes relating to the following:</p> <ul style="list-style-type: none"> <li>• Borrow Pit Management Plan</li> <li>• Air Quality Management Plan</li> <li>• Water Quality Management Plan</li> <li>• Noise Management Plan</li> <li>• Waste Management Plan</li> <li>• Emergency Response Plan</li> <li>• Dust Suppression Plan</li> <li>• Site Plan</li> <li>• Health and Safety Plan</li> </ul> <p>Each section shall describe the precise location of the required mitigation / monitoring, the persons responsible for the mitigation / monitoring, the schedule and reporting methodology. The SSEMP must be submitted within 30 days of the contract award and construction cannot commence until the SSEMPs are approved by the ARS and the Engineer.</p>	
	Incorporation of Items into Bid Documents	The Contractor shall be responsible for ensuring compliance with this EMP. A specific environmental section shall be included within the main Bid Documents indicating that the Contractor shall be responsible for conforming to the requirements of the EMP. As such this EMP shall be included as an annex to the Contract Bid Documents.	<ul style="list-style-type: none"> <li>• ARS to ensure EMP is included within Bid Documents</li> </ul>

<b>Table 2: BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Detailed Design Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Soils</b>	Soil Erosion	<ul style="list-style-type: none"> <li>• To reduce the impacts of erosion, the Contractors Detailed Designs shall ensure:</li> <li>• The side slopes of embankments will be designed to reflect soil strength and other considerations as included in the project specifications in order to reduce slips or erosion;</li> <li>• For embankments greater than 6m, stepped embankments will be used;</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to include mitigations in his detailed design.</li> <li>• Engineer to review and approve design documents.</li> </ul>
<b>Geology and Seismic Conditions</b>	Seismic Issues	The seismic characteristics of the potentially affected area shall be taken into account during the Detailed Design phase of the Project. Earthquake loading shall be applied to the design of structures, including bridges, to ensure that seismic events do not have negative impacts during the operational phase of the Project.	<ul style="list-style-type: none"> <li>• Contractor to include mitigations in his detailed design.</li> <li>• Engineer to review and approve design documents.</li> </ul>
<b>Hydrology</b>	Drainage	Consideration in the design phase will be given to the issue of drainage and culverts to ensure that drainage patterns are improved from the existing conditions and that increased run-off does not occur or result in flooding of areas previously undisturbed. During design, the Contractor shall ensure that all drainage works are designed based on the historical flood data and flood forecasting. A design discharge of 50 years return period is considered for culverts, and 100 years of bridges. The design of all structural components must conform to the design standards provided in the Employer's Special Requirements.	<ul style="list-style-type: none"> <li>• Engineer to review and approve design documents.</li> </ul>
	Drilling of Boreholes	The Contractor shall ensure that all required permits have been gathered prior to the excavation of any borehole.	<ul style="list-style-type: none"> <li>• Contractor to gather permits</li> <li>• Engineer to review permits prior to excavation works commencement.</li> </ul>
	Bridge Construction	All new and widened bridges must be designed for the life expectancy of 75 years. The bridge rehabilitation and strengthening works must be designed for the life expectancy of 50 years. The design loading and design of all structural components must conform to the bridge design standards provided in the Employer's Special Requirements. Finally, the bridge design and layout must be aesthetically pleasing and in harmony with the existing environment.	<ul style="list-style-type: none"> <li>• Engineer to review and approve design documents.</li> </ul>
<b>Historical and Archaeological Sites</b>	Impacts to Historical and Archaeologic	Designs shall ensure that there is no significant encroachment to any historical or archaeological site eventually discovered during Detailed Design.	<ul style="list-style-type: none"> <li>• Contractor to include mitigations in his detailed design.</li> </ul>

<b>Table 2: BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Detailed Design Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
	al Sites		<ul style="list-style-type: none"> <li>• Engineer to review and approve design documents.</li> </ul>
<b>Flora</b>	Loss of Trees	During Detailed Design the Contractor shall ensure that roadside activities such as asphalt plants, construction camps and other ancillary features are properly sited as agreed with the relevant CEP. The Contractor should avoid loss of trees where possible and should employ techniques such as asymmetrical widening. Where trees must be felled, the Contractor shall ensure that each one removed should be replaced by at least two new saplings of the same species or other at suitable locations, all as designated by the tree owner,	<ul style="list-style-type: none"> <li>• Contractor to include mitigations in his detailed design.</li> <li>• Engineer to review and approve design documents.</li> <li>• Contractor to replace trees during Construction with oversight from the Engineer.</li> </ul>
<b>Health and Safety</b>	Safety	The Contractor shall ensure that traffic safety issues shall be accounted for during the design phase of the Project, they including incorporation of: <ul style="list-style-type: none"> <li>• Safety barriers</li> <li>• Traffic signs</li> <li>• Road Crossings</li> <li>• Speed Bumps</li> <li>• Speed limits</li> </ul>	<ul style="list-style-type: none"> <li>• Engineer to review and approve design documents.</li> </ul>

<b>Table 3: BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Air Quality</b>	Open burning of waste materials	The Contractor shall ensure no burning of debris or other materials will occur on the Site without permission of the Engineer.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Fuel Emissions	Contractor shall ensure that no furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> </ul>

<b>Table 3:</b>			
<b>BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		consent of the Engineer.	<ul style="list-style-type: none"> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Exhaust emissions from the operation of construction machinery	<p>The Contractor shall ensure construction equipment shall be maintained to a good standard and fitted with pollution control devices. The equipment (including the pollution control devices) will be checked at regular intervals by the Engineer to ensure they are maintained in working order and the inspection result will be recorded by the Contractor &amp; Engineer as part of environmental monitoring. In addition, the Contractor shall:</p> <ul style="list-style-type: none"> <li>• Discourage of the idling of engines;</li> <li>• Prohibit of the use of equipment and machinery that causes excessive pollution (i.e. visible smoke) at project work sites;</li> </ul> <p>Ensure material stockpiles being located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne.</p>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Fugitive emissions from quarries and asphalt plants.	The Contractor shall ensure that conveyor belts at ancillary facilities (e.g. quarries) shall be fitted with wind-boards, and conveyor transfer points and hopper discharge areas shall be enclosed to minimize dust emission. All conveyors carrying materials that have the potential to create dust shall be totally enclosed and fitted with belt cleaners.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3: BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
	Dust generated from haul roads, unpaved roads, exposed soils and material stock piles.	<p>The Contractor shall ensure that the following dust suppression measures shall be instituted:</p> <ul style="list-style-type: none"> <li>• All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s);</li> <li>• Areas of reclamation shall be completed, including final compaction, as quickly as possible consistent with good practice to limit the creation of wind blown dust.</li> <li>• Hard surfaces will be required in areas with regular movements of vehicles; and</li> <li>• Effective use of water sprays will be implemented (e.g., all roads within the construction areas of the Site shall be sprayed at least twice each day, and more if necessary to control dust to the satisfaction of the Engineer).</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Topography</b>	Cut and Fill Requirement	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>• Temporary and permanent storage of materials should be confined to government owned land and in no circumstances should be dumped on agricultural or productive lands or to any watercourse including irrigation channels.</li> <li>• In the event of any spoil or debris from construction works being deposited in any of the afore mentioned areas or any silt washed down to any area, then all such spoil, debris or material and silt shall be immediately removed and the affected land and areas restored to their natural state by the Contractor to the satisfaction of the Engineer.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> <li>• Approvals for waste disposal sites to be sought from the NRA by the Contractor.</li> </ul>
	Slope Stabilization	<p>The Contractor shall be responsible for the following:</p> <ul style="list-style-type: none"> <li>• Final forming and re-vegetation will be completed by the Contractor as soon as possible following fill placement to facilitate regeneration of a stabilizing ground cover.</li> <li>• Trenching will be used where necessary to ensure successful establishment of vegetation.</li> <li>• Seeding with a fast growing crop and native seed mix (see <b>Specifications for</b></li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3: BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<p><b>list of species</b>) will occur immediately after fill placement to prevent scour and to encourage stabilization;</p> <ul style="list-style-type: none"> <li>• Construction in erosion and flood-prone areas will be restricted to the dry season.</li> </ul>	
	Quarries	<p>If licensed quarries are not available the Contractor may be made responsible for setting up their dedicated quarries. Prior to opening of any quarry or rock crushing facility, the Contractor will require approval from the relevant NRA and the Engineer to ensure that land owners are adequately compensated for land use and that the sites are not located in an area likely to cause significant detriment to the local environment. To ensure that this is the case Contractors should ensure that quarries and crusher plants are:</p> <ul style="list-style-type: none"> <li>• Located at least 300 meters from urban areas to prevent noise and dust impacts;</li> <li>• Located outside of agricultural land; and</li> <li>• Where possible located on government owned lands.</li> <li>• Quarry area should be reinstated prior to the completion of the project.</li> </ul>	<ul style="list-style-type: none"> <li>• NRA to approve locations.</li> <li>• Contractor to obtain necessary permits.</li> <li>• Engineer to review permits and approvals prior to the opening of the site.</li> <li>• Engineer to inspect the reinstatement work on the quarry area by the Contractor</li> </ul>
		<p>Alluvial material which will be excavated upstream from blocked culvert areas may be used as base material. This material shall be tested by the Contractor and Engineer for its suitability as base material before it maybe used. The Contractor must use such material first before using any other quarry or borrow pit within 3 km from any such alluvial deposit.</p>	<ul style="list-style-type: none"> <li>• Engineer to test material before use as base material.</li> </ul>
	Borrow Pits.	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>• Pit restoration will follow the completion of works in full compliance all applicable standards and specifications.</li> <li>• Arrangements for opening and using material borrow pits will contain enforceable provisions.</li> <li>• The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Engineer will be required before final acceptance and payment under the terms of contracts.</li> <li>• Additional borrow pits will not be opened without the restoration of those areas no longer in use.</li> <li>• Borrow pits should be reinstated prior to completion of the Project</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> <li>• Engineer to inspect the reinstatement work on the borrow pit by the Contracto</li> </ul>



<b>Table 3:</b>			
<b>BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Soils</b>	Loss of Land for Agricultural Production	The Engineer shall ensure that all appropriate LARP measures have been taken by the ARS before any alteration or destruction of agricultural land by the Contractor.	<ul style="list-style-type: none"> <li>• Engineer to coordinate with ARS &amp; Contractor.</li> </ul>
	Erosion	<p>The Contractor will be responsible for ensuing:</p> <ul style="list-style-type: none"> <li>• Material that is less susceptible to erosion will be selected for placement around bridges and culverts.</li> <li>• Re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local flora (see <b>Specifications</b>); (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth, although due to the arid conditions in most of the road, this may only be feasible where there is regular rainfall or other natural water supply.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Contamination due to Spills or Hazardous Materials	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>• All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>• The construction camp maintenance yard shall be constructed on impervious Layer with adequate drainage to collect spills, there shall be no vehicle maintenance activities on open ground.</li> <li>• Filling and refueling shall be strictly controlled and subject to formal procedures. Drip pans shall be placed under all filling and fueling areas. Waste oils shall be stored and disposed of by a licensed contractor.</li> <li>• All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>• The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any soils.</li> <li>• No bitumen drums or containers, full or used, shall be stored on open ground. They shall only be stored on impervious Layer.</li> <li>• Areas using bitumen shall be constructed on impervious Layer to prevent</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3:</b>			
<b>BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		seepage of oils into the soils.	
<b>Hydrology</b>	Drainage and Flooding	<p>The Contractor shall ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>• During the construction phase the Contractor is required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works.</li> <li>• The Contractor shall arrange with the village representatives those works which might interfere with the flow of irrigation waters to be carried out at such times as will cause the least disturbance to irrigation operations.</li> <li>• Should any operation being performed by the Contractor interrupt existing irrigation facilities, the Contractor shall restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Construction Camps and Storage Areas	<p>The Contractor shall ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.</li> <li>• There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited.</li> <li>• Liquid material storage containment areas shall not drain directly to surface water.</li> <li>• Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.</li> <li>• Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters.</li> <li>• Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.</li> <li>• Spill clean up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage: <ul style="list-style-type: none"> <li>– Fueling operations shall occur only within containment areas.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3:</b>			
<b>BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<ul style="list-style-type: none"> <li>- All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>- Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.</li> <li>- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.</li> <li>- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.</li> <li>- Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized for hazardous waste.</li> <li>• If determined warranted by the Engineer, the Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor shall ensure that all vehicles are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.</li> </ul>	
	Bridge Construction	<p>The Contractor shall consult with the local NRA to establish the fish spawning period in relation to the bridge construction works. The Contractor shall ensure that all works are undertaken in periods least likely to affect the fish spawning period. In addition, concerning bridge construction works, the Contractor shall:</p> <ul style="list-style-type: none"> <li>• Divert the water flow near the bridge piers.</li> <li>• Cofferdams, silt fences, sediment barriers or other devices will be provided to prevent migration of silt during construction within streams.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Contractor to consult with NRA.</li> <li>• Engineer to routinely monitor Contractor activities.</li> </ul>

<b>Table 3: BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<ul style="list-style-type: none"> <li>Dewatering and cleaning of cofferdams will be performed to prevent siltation by pumping from cofferdams to a settling basin or a containment unit.</li> </ul>	
<b>Flora and Fauna</b>	Loss of flora	<p>The Contractor shall ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>Each tree removed by the Contractor should be replaced by at least two new saplings of the same species or other at suitable locations, all as designated by the tree owner.</li> <li>Supplying appropriate and adequate fuel in workers' camps to prevent fuel-wood collection from unauthorized sources.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
	Affected flora and fauna	<ul style="list-style-type: none"> <li>The Contractor shall record any affected trees and submit a detailed report to the Engineer.</li> <li>Once any endemic animals are discovered at the site, the Contractor should ensure that such animals are not harmed and allowed to escape. Any breeding place should be left undisturbed. Contractor should issue strict instructions to workers not to harm endemic animals or breeding places of endemic species.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor should provide accurate list of affected trees at the site.</li> <li>Contractor to issue strict instruction to workers against harming endemic species or their habitats.</li> </ul>
	Protected Areas	The opening of additional borrow pits shall require the Contractor to receive the approval of the Environmental Agency and the Engineer to ensure there are no detrimental impacts to protected areas.	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Land Use</b>	Construction Camps and other ancillary facilities	The Contractor will be required to coordinate all construction camp activities with neighboring land uses. The Contractor shall also be responsible to maintain and cleanup campsites and respect the rights of local landowners. If located outside the RoW, written agreements with local landowners for temporary use of the property will be required and sites must be restored to a level acceptable to the owner within predetermined time period.	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Transport and Infrastructure</b>	Road closures, diversions and blocking of access routes	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>He shall be responsible for provision of all road diversion signs and ensure that diversion roads do not impact negatively upon private lands.</li> <li>Any diversions shall be agreed upon by the Engineer.</li> <li>Notices of delays, due to blasting (if any), shall be posted in villages within ten kilometers of the blasting area so villagers can plan their travel times</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3: BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<p>accordingly.</p> <ul style="list-style-type: none"> <li>The Contractor should make blasting at a regular period in the day so that the population in the valley becomes aware of the most likely delay periods.</li> <li>The Contractor shall be responsible for ensuring that all access routes are kept open during Project works for at least 50% of the day during construction works and 100% of the time after construction works are completed for the day.</li> </ul>	
	Electrical Systems	During construction the Contractor shall ensure that all power lines be kept operational, this may include the provision of temporary transmission lines while existing poles and lines are moved. The only exception to this item will be during periods of blasting when HV power lines will be switched off for safety.	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Waste and Spoil</b>	Spoil	Under no circumstances shall the Contractor dump excess materials on private lands without permission of the owner and approval from the Engineer. In addition, excess spoil shall not be dumped or pushed into rivers at any location unless in low volumes and agreed upon with the Engineer and with approval from the NRA.	<ul style="list-style-type: none"> <li>Contractor to implement mitigation.</li> <li>NRA to approve any waste disposal to the River.</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
	Inert Solid & Liquid waste	<p>The contractor shall be responsible for the following:</p> <ul style="list-style-type: none"> <li>Provide refuse containers at each worksite;</li> <li>Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all wastes before transportation and final disposal;</li> <li>Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process, and</li> <li>Collect and transport non-hazardous wastes to all approved disposal sites. The sites for waste disposal shall be agreed with the local municipal authorities and NRA. A specialized company may be contracted, if available to ensure collection of domestic and general waste from camps and temporary storage areas and transportation to landfills approved and licensed by the NRA.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to implement mitigation.</li> <li>NRA to approve any waste disposal site.</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
	Asphalt	It is recommended that discussions are undertaken with ARS to determine if it is	<ul style="list-style-type: none"> <li>ARS to assess feasibility.</li> </ul>

<b>Table 3:</b>			
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<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		feasible to re-process the asphalt for use on other local roads throughout the region. If it is determined to be cost effective, the Project should consider procuring equipment for this purpose.	
	Hazardous Waste	Management, handling & storage protocols for hazardous waste will be outlined in the Contractors Waste Management Plan. Disposal locations of hazardous wastes should be agreed with the NRA. The Contractor shall collect hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment or disposal at the temporary storage sites and further at the locations approved by NRA or pass it to the licensed operator having environmental permit on operation of the hazardous wastes.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• NRA to approve any waste disposal site.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Health and Safety</b>	Worker Health & safety	<p>The Contractor shall be responsible for provision of:</p> <ul style="list-style-type: none"> <li>• Safety Training Program. A Safety Training Program is required and shall consist of an Initial Safety Induction Course. All workmen shall be required to attend a safety induction course within their first week on Site and Periodic Safety Training Courses.</li> <li>• Safety Meetings. Regular safety meetings will be conducted on a monthly basis and shall require attendance by the safety representatives of Subcontractors unless otherwise agreed by the Engineer.</li> <li>• Safety Inspections. The Contractor shall regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. Lights and signs shall be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately.</li> <li>• Safety Equipment and Clothing. Safety equipment and protective clothing are required to be available on the Site at all material times and measures for the effective enforcement of proper utilization and necessary replacement of such equipment and clothing, and all construction plant and equipment used on or around the Site shall be fitted with appropriate safety devices.</li> <li>• First Aid facilities. A fully equipped first aid base shall be climatically controlled to maintain the temperature of the inside of the building at 20 degrees C. Arrangements for emergency medical services shall be made to the</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3: BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<p>satisfaction of the Engineer.</p> <p>The Contractor shall coordinate with local public health officials and shall reach a documented understanding with regard to the use of hospitals and other community facilities.</p>	
	Sub-contractor H&S	All sub-contractors will be supplied with copies of the SSEMP. Provisions will be incorporated into all sub-contracts to ensure the compliance with the SSEMP at all tiers of the sub-contracting. All sub-contractors will be required to appoint a safety representative who shall be available on the Site throughout the operational period of the respective sub-contract unless the Engineers approval to the contrary is given in writing. In the event of the Engineers approval being given, the Engineer, without prejudice to their other duties and responsibilities, shall ensure, as far as is practically possible, that employees of subcontractors of all tiers are conversant with appropriate parts of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors and sub-contractors activities.</li> </ul>
	HIV / AIDS	The Contractor shall subcontract with an Approved Service Provider to provide an HIV Awareness Program to the Contractor’s Personnel and the Local Community as soon as practicable after the Contractor’s Personnel arrive at the Site but in any case within two weeks after the Contractor’s Personnel arrive at Site and to repeat the HIV Awareness Program at intervals not exceeding four months	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Service Provider to implement training.</li> <li>• Engineer to review program.</li> </ul>
<b>Historical and archaeological areas</b>	Impacts to Historical and archaeological areas	<p>To avoid potential adverse impacts to historic and cultural resources, the Contractor shall:</p> <ul style="list-style-type: none"> <li>• Adhere to accepted international practice and all applicable historic and cultural preservation requirements of the Government of Azerbaijan, including all appropriate local government entities, and</li> <li>• In the event of unanticipated discoveries of cultural or historic artifacts (movable or immovable) in the course of the work, the Contractor shall take all necessary measures to protect the findings and shall notify the Engineer and the Ministry of Culture. If continuation of the work would endanger the finding, project work shall be suspended until a solution for preservation of the artifacts is agreed upon.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Noise</b>	Construction	The Contractor shall ensure provision of the following:	<ul style="list-style-type: none"> <li>• Contractor to implement</li> </ul>

<b>Table 3:</b>			
<b>BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
	Noise and Vibration	<ul style="list-style-type: none"> <li>• Source Controls, i.e., requirements that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken;</li> <li>• Site Controls, i.e., requirements that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible;</li> <li>• Work near Sensitive Receptors shall be limited to short term activities;</li> <li>• Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the Engineer having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. When operating close to sensitive areas such as residential, nursery, or medical facilities, the Contractor’s hours of working shall be limited to 8 AM to 6 PM;</li> <li>• Community Awareness, i.e., public notification of construction operations will incorporate noise considerations; methods to handle complaints will be specified. Sensitive receptors will be avoided as possible (i.e., aggregate crushers, operators, etc.). Disposal sites and haul routes will be coordinated with local officials;</li> <li>• Use of low volume charges will reduce the potential for vibration induced damage to structures; and in the event of damage proven to be due to the contractor’s activities, owners of structures will be fully compensated.</li> </ul>	<p style="text-align: center;">mitigation</p> <ul style="list-style-type: none"> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>



<b>Table 4: BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP Operational and Maintenance Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Air Quality</b>	Air quality impacts from Vehicle movements	Potential impacts due to the use of the new bridges and rehabilitated rural roads are the purview of ARS.	<ul style="list-style-type: none"> <li>• ARS to monitor air emissions during the operational phase of the Project</li> </ul>
<b>Soils</b>	Erosion	Contracts stipulated that the Contractor shall be liable for a one year defects liability period. During this year the NRAs should undertake regular observational monitoring of the Project Road to ensure that engineering works and vegetation growth have prevented erosion impacts. If the NRAs discover any potential issues they shall report their findings to the ARS who shall then make the Contractor responsible for final improvements. Final payments can not be made until outstanding issues are resolved	<ul style="list-style-type: none"> <li>• NRAs to monitor vegetation growth and erosion impacts during defects liability period.</li> </ul>
<b>Hydrology</b>	Impacts to hydrology and water quality) as a result of construction activities.	Contracts stipulated that the Contractor shall be liable for a one year defects liability period. During this year the locals NRAs should undertake regular water quality monitoring and routine observational monitoring of construction areas close to the 3 Rivers affected and its tributaries to ensure that the road works are not having any continuous impacts upon the hydrological conditions of the region. If the NRAs discover any potential issues they shall report their findings to the ARS who shall then make the Contractor responsible for final improvements. Final payments can not be made until outstanding issues are resolved.	<ul style="list-style-type: none"> <li>• NRAs to monitor water quality during defects liability period.</li> </ul>

<b>Table 5 BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP: Pre-construction Phase Instrumental Monitoring</b>					
<b>Issue</b>	<b>Mitigation</b>	<b>Locations</b>	<b>Schedule</b>	<b>Responsibilities</b>	<b>Reporting</b>
Water Quality Impacts due to construction works	The Contractor shall undertake baseline instrumental monitoring during the Pre-construction phase. Parameters to be monitored to establish a baseline include: <ul style="list-style-type: none"> <li>• Total Suspended Solids (TSS)</li> </ul>	Baseline monitoring locations include: <ul style="list-style-type: none"> <li>• 50 meters down stream of each borrow pit locations;</li> <li>• 50 meters downstream of the Aji Dara River Bridge.</li> </ul>	Water quality baseline monitoring shall be carried out as soon after the date of acceptance of the Bid as practicable to	The Contractor shall engage a third party monitoring agency to undertake the	The Agency shall provide his results to the Contractor and Engineer prior to the start of

**Table 5**  
**BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP: Pre-construction Phase Instrumental Monitoring**

Issue	Mitigation	Locations	Schedule	Responsibilities	Reporting
	<ul style="list-style-type: none"> <li>Biological Oxygen Demand (BOD)</li> <li>Dissolved oxygen (DO)</li> <li>Fecal coliform</li> <li>Oil and grease</li> </ul>	In addition, the Engineer may also recommend additional monitoring locations during baseline monitoring and during construction. However, as an indicator the number of sampling locations, including the baseline locations, should not exceed ten.	determine ambient levels of the pollutants at the specified monitoring locations which will be identified in the SSEMP.	baseline monitoring. The Agency shall be approved by the NRA.	Project works.
Air quality	<p>The Contractor shall undertake baseline instrumental monitoring during the Pre-construction phase. Parameters to be monitored to establish a baseline include:</p> <ul style="list-style-type: none"> <li>Total Suspended Particulates (TSP)</li> <li>Sulfur Dioxide (SO<sub>2</sub>)</li> <li>Nitrogen Dioxide (NO<sub>2</sub>)</li> <li>Carbon Monoxide (CO)</li> </ul>	The recommended baseline monitoring locations include 1 location at each construction site or every 10 Km on rural roads. In addition, the Engineer may also recommend additional monitoring locations during the baseline monitoring. However, as an indicator the number of sampling locations should not exceed ten.	Air quality baseline monitoring shall be carried out as soon after the date of acceptance of the Bid as practicable to determine ambient levels of the air pollutants at the specified monitoring locations which will be identified in the SSEMP.	The Contractor shall engage a third part monitoring agency to undertake the baseline monitoring. The Agency shall be approved by the NRA.	The Agency shall provide his results to the Contractor and Engineer prior to the start of Project works.

**Table 6**  
**BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP: Construction Phase Instrumental Monitoring**

Issue	Mitigation	Locations	Schedule	Responsibilities	Reporting
<b>Air Quality</b>	The Contractor shall establish routine Air Quality Monitoring throughout the construction period. The following parameters shall be monitored: (TSP), Sulfur Dioxide (SO <sub>2</sub> ), Nitrogen Dioxide	At the locations of the baselines monitoring and at any additional locations to be determined by the Engineer (not to exceed ten per	Monitoring to be undertaken once every three months	The Contractor shall hire an independent monitoring consultant to	The Independent Specialist shall provide his results to the

**Table 6**  
**BRIDGE No. 3, R-24, POYLU – SADIQLI – GURCUSTAN ROAD; KM 29+500: EMP: Construction Phase Instrumental Monitoring**

<b>Issue</b>	<b>Mitigation</b>	<b>Locations</b>	<b>Schedule</b>	<b>Responsibilities</b>	<b>Reporting</b>
	(NO <sub>2</sub> ) and Carbon Monoxide (CO). Other parameters maybe warranted as and when requested by the Engineer.	monitoring period).		perform the monitoring activities.	Contractor and Engineer within three days of the sampling activity.
<b>Surface Water Quality</b>	The Contractor shall ensure that routine surface water monitoring is undertaken throughout the construction period. Measured water quality parameters shall include <ul style="list-style-type: none"> <li>• Total Suspended solids (TSS)</li> <li>• Biological Oxygen Demand (BOD)</li> <li>• Dissolved oxygen (DO),</li> <li>• Conductivity - Fecal coliform</li> <li>• Oil and grease</li> </ul>	Locations will be determined in consultation with the Engineer and the NRA and shall include the baseline locations above and any other likely to be subject to water quality impacts or significant runoff (construction camps, staging areas, etc.).	Monitoring to be undertaken monthly	Responsibilities – The Contractor shall hire an independent air quality monitoring consultant.	The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.
<b>Noise</b>	The Contractor shall ensure that routine noise monitoring is undertaken throughout the construction period. Parameters to be monitored to establish a baseline include: Laeq 1h (dBA)	Locations will be determined in consultation with the Engineer and the local NRA	Bi-Monthly throughout construction.	The Contractor shall hire an independent noise monitoring consultant.	The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.

**Annex 6 – EMP for Bridge No. 4**

**Environmental Management Plan**  
**BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100**

**Table 1:**  
**BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100:**  
**EMP Pre-construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
<b>Air Quality</b>	Air quality impacts from stationary sources	Locations for quarry sites, borrow pits and asphalt plants shall require approval from the Engineer and National & Regional Authorities (NRA) during the Pre-construction phase. Efforts should be made to ensure that these facilities are as near to the Project road as practical to avoid unnecessary trips and potential dust issues from vehicle movements during construction works. In addition, no quarry, borrow pit or asphalt plant shall be located within 300 meters of any urban area, protected area or sensitive receptor.	<ul style="list-style-type: none"> <li>• Contractor to select sites</li> <li>• Engineer and NRAs to approve sites.</li> </ul>
<b>Topography</b>	Selection of Quarry Sites	<p>Several potential quarry sites have been identified by AzerRoadService (ARS), although they do not currently have permits. These quarry sites must obtain the required permits prior to commencement of works at these sites. This shall include approval from the NRA and the Engineer. Efforts should be made to ensure that quarries are as near to the site as practical to avoid unnecessary journeys. However, no quarry shall be located within one kilometer of any urban area, protected area or sensitive receptor. The locations of the quarries shall be indicated within the Contractors SSEMP. In addition, Contractors should ensure that quarries and crusher plants are:</p> <ul style="list-style-type: none"> <li>- Located at least 300 meters from residential areas to prevent noise and dust impacts;</li> <li>- Located outside of agricultural land; and</li> <li>- Where possible located on government owned lands.</li> </ul> <p>In addition, alluvial material which will be excavated upstream from blocked culvert areas may be used as base material. This material shall be tested by the Contractor and Engineer for its suitability as base material before it maybe used. A quarry site reinstatement plan should be presented to the Engineer prior to operating quarry sites. Such plan should be implemented prior to the end of the project</p>	<ul style="list-style-type: none"> <li>• Contractor to select quarry sites and apply for approval from NRAs and any other regulatory agencies.</li> <li>• Engineer to review quarry locations, licenses and approvals from ARS and NRA.</li> <li>• Engineer to test suitability of alluvial material.</li> <li>• Engineer to verify and approve the quarry site reinstatement plan</li> </ul>
<b>Hydrology / Soils</b>	Selection of Borrow Pits	Due to the sensitivity of the borrow pit locations, the Contractor shall prepare a Borrow Pit Action Plan (BAP) that should be submitted as part of the SSEMP to the Engineer	<ul style="list-style-type: none"> <li>• Contractor to select borrow sites and apply for approval</li> </ul>

**Table 1:  
BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100:  
EMP Pre-construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<p>prior to the start of construction. The plan will identify the locations of all proposed borrow pits. The locations of the borrow pits shall be approved by both, the Engineer and ARS, and the NRAs. No borrow pit shall be located within five hundred meters of any protected area. The locations of the borrow pits shall be indicated within the Contractors SSEMP. In addition, the Contractor should present a borrow pit reinstatement plan.</p>	<p>from NRAs and any other regulatory agencies.</p> <ul style="list-style-type: none"> <li>• Engineer to review borrow locations, licenses and approvals from ARS and NRA.</li> <li>• Engineer to verify and approve the borrow pit reinstatement pla</li> </ul>
	<p>Selection of Asphalt Plant Location</p>	<p>No new asphalt plant shall be located within five hundred meters of any urban area, protected area or sensitive receptor. The locations of the asphalt plants shall be indicated within the Contractors SSEMP. Asphalt plant locations shall be approved by the Engineer, ARS and the NRA.</p>	<ul style="list-style-type: none"> <li>• Contractor to select sites and apply for approval from NRAs and any other regulatory agencies.</li> <li>• Engineer to review locations, licenses and approvals from ARS and NRA.</li> </ul>
	<p>Selection of Construction Camp Site</p>	<p>The Contractor shall be responsible for the preparation of a Construction Camp Site Plan which will form part of the SSEMP. The Plan shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. The Contractor shall ensure the following conditions are met within the Plan:</p> <ul style="list-style-type: none"> <li>• Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.</li> <li>• There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited.</li> <li>• Liquid material storage containment areas shall not drain directly to surface water.</li> <li>• Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.</li> <li>• Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters.</li> </ul>	<ul style="list-style-type: none"> <li>• Engineer to review &amp; approve Site Plan</li> </ul>

**Table 1:  
BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100:  
EMP Pre-construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<ul style="list-style-type: none"> <li>• Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.</li> <li>• Spill clean up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage: <ul style="list-style-type: none"> <li>- Fueling operations shall occur only within containment areas.</li> <li>- All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>- Filling and refueling shall be strictly controlled and subject to formal procedures and will take place withinreas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.</li> <li>- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.</li> <li>- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.</li> <li>- Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized forhazardous waste.</li> </ul> </li> </ul> <p>Site plans shall be devised to ensure that, insofar as possible, all temporary construction facilities are locate at least 50 meters away from a water course, stream, or canal. If determined warranted by the Engineer, the Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor shall ensure that all vehicle are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.</p>	

**Table 1:  
BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100:  
EMP Pre-construction Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
<b>Soils</b>	Contamination of Soils	The Contractor will be responsible for preparation of an Emergency Response Plan (ERP), which will cover containment of hazardous materials, oil spills, and work-site accidents. The plan will detail the process for handling, and subsequently reporting, emergencies, and specify the organizational structure (including responsibilities of nominated personnel). The plan will be submitted to the Engineer for approval as part of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to prepare ERP</li> <li>• Engineer to review and approve ERP as part of the SSEMP</li> </ul>
<b>Air Quality</b>	Air Quality	The Contractor shall be responsible for the preparation of an Air Quality Plan (AQP), submitted to the Engineer prior to commencement of the works. The plan will detail the action to be taken to minimize dust generation (e.g. spraying unsurfaced roads with water, covering stock-piles, and blasting with use of small charges etc) and will identify the type, age and standard of equipment to be used. The Plan shall also include contingencies for the accidental release of toxic air pollutants. The Plan shall be completed during the design phase and shall form part of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to prepare AQP</li> <li>• Engineer to review and approve ERP as part of the SSEMP</li> </ul>
<b>Flora</b>	Vegetation procurement	The Contractor shall be responsible for identifying locations where he may procure specific vegetation for slope stabilization. The vegetation types should include; Elm - Celtis caucasica, Judas-tree, certis – Certis, Senna- Colutea vulgaris & Dog rose - Rosa cocanika. Embankment for bridge approaches should be stabilized as per design and with the use of native grasses and vegetation in conformance with the design.	<ul style="list-style-type: none"> <li>• Contractor to select sites.</li> </ul>
<b>Land Use</b>	Loss of Property and Land	In such circumstances necessary, the ARS must prepare the Land Acquisition and Resettlement Plan (the LARP), obtain the approval of ADB and then implement the plan and acquire the land prior to the start of Pre-construction activities.	<ul style="list-style-type: none"> <li>• ARS to complete LARP (when necessary)</li> <li>• ADB to approve LARP (when necessary)</li> </ul>
<b>Waste and Spoil</b>	Waste Management	<p>The Contractor shall be responsible for preparing a Waste Management Plan (WMP) to manage all excess spoil and waste material. The Plan, which forms part of the SSEMP, shall include items relating to the safe handling and management of:</p> <ul style="list-style-type: none"> <li>• Domestic waste</li> <li>• Food waste</li> <li>• Inert garbage</li> <li>• Recycled Waste</li> <li>• Plastic</li> <li>• Metals</li> <li>• Wood</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to prepare WMP</li> <li>• Engineer to review and approve WMP as part of the SSEMP</li> </ul>

<b>Table 1: BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP Pre-construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		<ul style="list-style-type: none"> <li>• Construction Waste</li> <li>• Hazardous Waste</li> <li>• Liquid Waste</li> </ul> <p>The Plan will also include provisions to manage all excess spoil material. The Plan should indicate where the spoil will occur and methods and locations for disposal.</p>	
<b>Health and safety</b>	Worker Health and Safety	A Health and Safety Plan (HSP) shall be prepared by the Contractor, as part of the SSEMP, to manage worker safety. The plan shall include an item relating to accidental release of toxic fumes.	<ul style="list-style-type: none"> <li>• Contractor to prepare HSP</li> <li>• Engineer to review and approve HSP as part of the SSEMP</li> </ul>
<b>EMP Requirement</b>	Preparation of SSEMP	<p>The Contractor shall prepare a SSEMP to meet the requirements of this EMP. Specifically the SSEMP shall contain sections relating to:</p> <ul style="list-style-type: none"> <li>• Management of Physical Environment <ul style="list-style-type: none"> <li>- Soils</li> <li>- Water</li> <li>- Air</li> </ul> </li> <li>• Management of Ecological Environmental <ul style="list-style-type: none"> <li>- Flora</li> <li>- Fauna</li> <li>- Protected Areas</li> </ul> </li> <li>• Management of Economic Characteristics <ul style="list-style-type: none"> <li>- Infrastructure</li> <li>- Transport</li> <li>- Land Use</li> <li>- Agriculture</li> </ul> </li> <li>• Management of Social and Cultural Resources <ul style="list-style-type: none"> <li>- Communities, Health and Education Facilities</li> <li>- Historical and Cultural Areas</li> <li>- Noise</li> </ul> </li> </ul> <p>In addition, the SSEMP shall contain specific Management Plans as Annexes relating to the following:</p>	<ul style="list-style-type: none"> <li>• Contractor to prepare SSEMP</li> <li>• Engineer to review and approve SSEMP</li> </ul>



<b>Table 1:</b> <b>BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100:</b> <b>EMP Pre-construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<ul style="list-style-type: none"> <li>• Borrow Pit Management Plan</li> <li>• Air Quality Management Plan</li> <li>• Water Quality Management Plan</li> <li>• Noise Management Plan</li> <li>• Waste Management Plan</li> <li>• Emergency Response Plan</li> <li>• Dust Suppression Plan</li> <li>• Site Plan</li> <li>• Health and Safety Plan</li> </ul> <p>Each section shall describe the precise location of the required mitigation / monitoring, the persons responsible for the mitigation / monitoring, the schedule and reporting methodology. The SSEMP must be submitted within 30 days of the contract award and construction cannot commence until the SSEMPs are approved by the ARS and the Engineer.</p>	
	Incorporation of Items into Bid Documents	The Contractor shall be responsible for ensuring compliance with this EMP. A specific environmental section shall be included within the main Bid Documents indicating that the Contractor shall be responsible for conforming to the requirements of the EMP. As such this EMP shall be included as an annex to the Contract Bid Documents.	<ul style="list-style-type: none"> <li>• ARS to ensure EMP is included within Bid Documents</li> </ul>

<b>Table 2:</b> <b>BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100:</b> <b>EMP Detailed Design Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
Soils	Soil Erosion	<ul style="list-style-type: none"> <li>• To reduce the impacts of erosion, the Contractors Detailed Designs shall ensure:</li> <li>• The side slopes of embankments will be designed to reflect soil strength and other considerations as included in the project specifications in order to reduce slips or erosion;</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to include mitigations in his detailed design.</li> <li>• Engineer to review and</li> </ul>

**Table 2:  
BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100:  
EMP Detailed Design Phase Mitigation**

Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<ul style="list-style-type: none"> <li>For embankments greater than 6m, stepped embankments will be used;</li> </ul>	approve design documents.
<b>Geology and Seismic Conditions</b>	Seismic Issues	The seismic characteristics of the potentially affected area shall be taken into account during the Detailed Design phase of the Project. Earthquake loading shall be applied to the design of structures, including bridges, to ensure that seismic events do not have negative impacts during the operational phase of the Project.	<ul style="list-style-type: none"> <li>Contractor to include mitigations in his detailed design.</li> <li>Engineer to review and approve design documents.</li> </ul>
<b>Hydrology</b>	Drainage	Consideration in the design phase will be given to the issue of drainage and culverts to ensure that drainage patterns are improved from the existing conditions and that increased run-off does not occur or result in flooding of areas previously undisturbed. During design, the Contractor shall ensure that all drainage works are designed based on the historical flood data and flood forecasting. A design discharge of 50 years return period is considered for culverts, and 100 years of bridges. The design of all structural components must conform to the design standards provided in the Employer's Special Requirements.	<ul style="list-style-type: none"> <li>Engineer to review and approve design documents.</li> </ul>
	Drilling of Boreholes	The Contractor shall ensure that all required permits have been gathered prior to the excavation of any borehole.	<ul style="list-style-type: none"> <li>Contractor to gather permits</li> <li>Engineer to review permits prior to excavation works commencement.</li> </ul>
	Bridge Construction	All new and widened bridges must be designed for the life expectancy of 75 years. The bridge rehabilitation and strengthening works must be designed for the life expectancy of 50 years. The design loading and design of all structural components must conform to the bridge design standards provided in the Employer's Special Requirements. Finally, the bridge design and layout must be aesthetically pleasing and in harmony with the existing environment.	<ul style="list-style-type: none"> <li>Engineer to review and approve design documents.</li> </ul>
<b>Historical and Archeological Sites</b>	Impacts to Historical and Archeological Sites	Designs shall ensure that there is no significant encroachment to any historical or archeological site eventually discovered during Detailed Design.	<ul style="list-style-type: none"> <li>Contractor to include mitigations in his detailed design.</li> <li>Engineer to review and approve design documents.</li> </ul>
<b>Flora</b>	Loss of Trees	During Detailed Design the Contractor shall ensure that roadside activities such as asphalt plants, construction camps and other ancillary features are properly sited as	<ul style="list-style-type: none"> <li>Contractor to include mitigations in his detailed</li> </ul>

<b>Table 2: BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP Detailed Design Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		agreed with the relevant CEP. The Contractor should avoid loss of trees where possible and should employ techniques such as asymmetrical widening. Where trees must be felled, the Contractor shall ensure that each one removed should be replaced by at least two new saplings of the same species or other at suitable locations, all as designated by the tree owner,	design. <ul style="list-style-type: none"> <li>• Engineer to review and approve design documents.</li> <li>• Contractor to replace trees during Construction with oversight from the Engineer.</li> </ul>
<b>Health and Safety</b>	Safety	The Contractor shall ensure that traffic safety issues shall be accounted for during the design phase of the Project, they including incorporation of: <ul style="list-style-type: none"> <li>• Safety barriers</li> <li>• Traffic signs</li> <li>• Road Crossings</li> <li>• Speed Bumps</li> <li>• Speed limits</li> </ul>	<ul style="list-style-type: none"> <li>• Engineer to review and approve design documents.</li> </ul>

<b>Table 3: BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Air Quality</b>	Open burning of waste materials	The Contractor shall ensure no burning of debris or other materials will occur on the Site without permission of the Engineer.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Fuel Emissions	Contractor shall ensure that no furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the Engineer.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Exhaust emissions	The Contractor shall ensure construction equipment shall be maintained to a good standard and fitted with pollution control devices. The equipment (including the pollution control	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> </ul>

<b>Table 3: BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP Construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
	from the operation of construction machinery	<p>devices) will be checked at regular intervals by the Engineer to ensure they are maintained in working order and the inspection result will be recorded by the Contractor &amp; Engineer as part of environmental monitoring. In addition, the Contractor shall:</p> <ul style="list-style-type: none"> <li>• Discourage of the idling of engines;</li> <li>• Prohibit of the use of equipment and machinery that causes excessive pollution (i.e. visible smoke) at project work sites;</li> </ul> <p>Ensure material stockpiles being located in sheltered areas and be covered with tarpaulins or other such suitable covering to prevent material becoming airborne.</p>	<ul style="list-style-type: none"> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Fugitive emissions from quarries and asphalt plants.	The Contractor shall ensure that conveyor belts at ancillary facilities (e.g. quarries) shall be fitted with wind-boards, and conveyor transfer points and hopper discharge areas shall be enclosed to minimize dust emission. All conveyors carrying materials that have the potential to create dust shall be totally enclosed and fitted with belt cleaners.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Dust generated from haul roads, unpaved roads, exposed soils and material stock piles.	<p>The Contractor shall ensure that the following dust suppression measures shall be instituted:</p> <ul style="list-style-type: none"> <li>• All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s);</li> <li>• Areas of reclamation shall be completed, including final compaction, as quickly as possible consistent with good practice to limit the creation of wind blown dust.</li> <li>• Hard surfaces will be required in areas with regular movements of vehicles; and</li> <li>• Effective use of water sprays will be implemented (e.g., all roads within the construction areas of the Site shall be sprayed at least twice each day, and more if necessary to control dust to the satisfaction of the Engineer).</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Topography</b>	Cut and Fill Requirement	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>• Temporary and permanent storage of materials should be confined to government owned land and in no circumstances should be dumped on agricultural or productive lands or to any watercourse including irrigation channels.</li> <li>• In the event of any spoil or debris from construction works being deposited in any of the afore mentioned areas or any silt washed down to any area, then all such spoil, debris or material and silt shall be immediately removed and the affected land and areas restored to their natural state by the Contractor to the satisfaction of the Engineer.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> <li>• Approvals for waste disposal sites to be sought from the NRA by the Contractor.</li> </ul>

<b>Table 3:</b>			
<b>BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP Construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
	Slope Stabilization	<p>The Contractor shall be responsible for the following:</p> <ul style="list-style-type: none"> <li>• Final forming and re-vegetation will be completed by the Contractor as soon as possible following fill placement to facilitate regeneration of a stabilizing ground cover.</li> <li>• Trenching will be used where necessary to ensure successful establishment of vegetation.</li> <li>• Seeding with a fast growing crop and native seed mix (see <b>Specifications for list of species</b>) will occur immediately after fill placement to prevent scour and to encourage stabilization;</li> <li>• Construction in erosion and flood-prone areas will be restricted to the dry season.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Quarries	<p>If licensed quarries are not available the Contractor may be made responsible for setting up their dedicated quarries. Prior to opening of any quarry or rock crushing facility, the Contractor will require approval from the relevant NRA and the Engineer to ensure that land owners are adequately compensated for land use and that the sites are not located in an area likely to cause significant detriment to the local environment. To ensure that this is the case Contractors should ensure that quarries and crusher plants are:</p> <ul style="list-style-type: none"> <li>• Located at least 300 meters from urban areas to prevent noise and dust impacts;</li> <li>• Located outside of agricultural land; and</li> <li>• Where possible located on government owned lands.</li> <li>• Quarry area should be reinstated prior to the completion of the project</li> </ul>	<ul style="list-style-type: none"> <li>• NRA to approve locations.</li> <li>• Contractor to obtain necessary permits.</li> <li>• Engineer to review permits and approvals prior to the opening of the site.</li> <li>• Engineer to inspect the reinstatement work on the quarry area by the Contractor</li> </ul>
		<p>Alluvial material which will be excavated upstream from blocked culvert areas may be used as base material. This material shall be tested by the Contractor and Engineer for its suitability as base material before it maybe used. The Contractor must use such material first before using any other quarry or borrow pit within 3 km from any such alluvial deposit.</p>	<ul style="list-style-type: none"> <li>• Engineer to test material before use as base material.</li> </ul>
	Borrow Pits.	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>• Pit restoration will follow the completion of works in full compliance all applicable standards and specifications.</li> <li>• Arrangements for opening and using material borrow pits will contain enforceable provisions.</li> <li>• The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Engineer will be required before final acceptance and payment under the terms of contracts.</li> <li>• Additional borrow pits will not be opened without the restoration of those areas no</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> <li>• Engineer to inspect the reinstatement work on the borrow pit by the Contractor</li> </ul>

<b>Table 3: BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP Construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		longer in use. <ul style="list-style-type: none"> <li>Borrow pits should be reinstated prior to completion of the Project</li> </ul>	
<b>Soils</b>	Loss of Land for Agricultural Production	The Engineer shall ensure that all appropriate LARP measures have been taken by the ARS before any alteration or destruction of agricultural land by the Contractor.	<ul style="list-style-type: none"> <li>Engineer to coordinate with ARS &amp; Contractor.</li> </ul>
	Erosion	The Contractor will be responsible for ensuring: <ul style="list-style-type: none"> <li>Material that is less susceptible to erosion will be selected for placement around bridges and culverts.</li> <li>Re-vegetation of exposed areas including; (i) selection of fast growing and grazing resistant species of local flora (see <b>Specifications</b>); (ii) immediate re-vegetation of all slopes and embankments if not covered with gabion baskets; (iii) placement of fiber mats to encourage vegetation growth, although due to the arid conditions in most of the road, this may only be feasible where there is regular rainfall or other natural water supply.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
	Contamination due to Spills or Hazardous Materials	The Contractor shall ensure that: <ul style="list-style-type: none"> <li>All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</li> <li>The construction camp maintenance yard shall be constructed on impervious Layer with adequate drainage to collect spills, there shall be no vehicle maintenance activities on open ground.</li> <li>Filling and refueling shall be strictly controlled and subject to formal procedures. Drip pans shall be placed under all filling and fueling areas. Waste oils shall be stored and disposed of by a licensed contractor.</li> <li>All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any soils.</li> <li>No bitumen drums or containers, full or used, shall be stored on open ground. They shall only be stored on impervious Layer.</li> <li>Areas using bitumen shall be constructed on impervious Layer to prevent seepage of</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3:</b>			
<b>BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP Construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		oils into the soils.	
<b>Hydrology</b>	Drainage and Flooding	<p>The Contractor shall ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>• During the construction phase the Contractor is required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works.</li> <li>• The Contractor shall arrange with the village representatives those works which might interfere with the flow of irrigation waters to be carried out at such times as will cause the least disturbance to irrigation operations.</li> <li>• Should any operation being performed by the Contractor interrupt existing irrigation facilities, the Contractor shall restore the irrigation appurtenances to their original working conditions within 24 hours of being notified of the interruption.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Construction Camps and Storage Areas	<p>The Contractor shall ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.</li> <li>• There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited.</li> <li>• Liquid material storage containment areas shall not drain directly to surface water.</li> <li>• Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.</li> <li>• Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters.</li> <li>• Discharge of sediment-laden construction water directly into surface watercourses will be forbidden. Sediment laden construction water will be discharged into settling lagoons or tanks prior to final discharge.</li> <li>• Spill clean up equipment will be maintained on site. The following conditions to avoid adverse impacts due to improper fuel and chemical storage: <ul style="list-style-type: none"> <li>- Fueling operations shall occur only within containment areas.</li> <li>- All fuel and chemical storage (if any) shall be sited on an impervious base within bund and secured by fencing. The storage area shall be located away from any</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3: BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP Construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<p>watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</p> <ul style="list-style-type: none"> <li>- Filling and refueling shall be strictly controlled and subject to formal procedures and will take place withinreas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.</li> <li>- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</li> <li>- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.</li> <li>- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.</li> <li>- Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized forhazardous waste.</li> </ul> <ul style="list-style-type: none"> <li>• If determined warranted by the Engineer, the Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor shall ensure that all vehicle are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.</li> </ul>	
	Bridge Construction	<p>The Contractor shall consult with the local NRA to establish the fish spawning period in relation to the bridge construction works. The Contractor shall ensure that all works are undertaken in periods least likely to affect the fish spawning period. In addition, concerning bridge construction works, the Contractor shall:</p> <ul style="list-style-type: none"> <li>• Divert the water flow near the bridge piers.</li> <li>• Cofferdams, silt fences, sediment barriers or other devices will be provided to prevent migration of silt during construction within streams.</li> <li>• Dewatering and cleaning of cofferdams will be performed to prevent siltation by pumping from cofferdams to a settling basin or a containment unit.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• Contractor to consult with NRA.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
Flora and Fauna	Loss of flora	<p>The Contractor shall ensure the following conditions are met:</p> <ul style="list-style-type: none"> <li>• Each tree removed by the Contractor should be replaced by at least two new saplings of the same species or other at suitable locations, all as designated by the tree owner.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor</li> </ul>



<b>Table 3: BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP Construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<ul style="list-style-type: none"> <li>Supplying appropriate and adequate fuel in workers' camps to prevent fuel-wood collection from unauthorized sources.</li> </ul>	Contractors activities.
	Affected flora and fauna	<ul style="list-style-type: none"> <li>The Contractor shall record any affected trees and submit a detailed report to the Engineer.</li> <li>Once any endemic animals are discovered at the site, the Contractor should ensure that such animals are not harmed and allowed to escape. Any breeding place should be left undisturbed. Contractor should issue strict instructions to workers not to harm endemic animals or breeding places of endemic species.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor should provide accurate list of affected trees at the site.</li> <li>Contractor to issue strict instruction to workers against harming endemic species or their habitats.</li> </ul>
	Protected Areas	The opening of additional borrow pits shall require the Contractor to receive the approval of the Environmental Agency and the Engineer to ensure there are no detrimental impacts to protected areas.	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Land Use</b>	Construction Camps and other ancillary facilities	The Contractor will be required to coordinate all construction camp activities with neighboring land uses. The Contractor shall also be responsible to maintain and cleanup campsites and respect the rights of local landowners. If located outside the RoW, written agreements with local landowners for temporary use of the property will be required and sites must be restored to a level acceptable to the owner within predetermined time period.	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Transport and Infrastructure</b>	Road closures, diversions and blocking of access routes	<p>The Contractor shall ensure that:</p> <ul style="list-style-type: none"> <li>He shall be responsible for provision of all road diversion signs and ensure that diversion roads do not impact negatively upon private lands.</li> <li>Any diversions shall be agreed upon by the Engineer.</li> <li>Notices of delays, due to blasting (if any), shall be posted in villages within ten kilometers of the blasting area so villagers can plan their travel times accordingly.</li> <li>The Contractor should make blasting at a regular period in the day so that the population in the valley becomes aware of the most likely delay periods.</li> <li>The Contractor shall be responsible for ensuring that all access routes are kept open during Project works for at least 50% of the day during construction works and 100% of the time after construction works are completed for the day.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor Contractors activities.</li> </ul>
	Electrical Systems	During construction the Contractor shall ensure that all power lines be kept operational, this may include the provision of temporary transmission lines while existing poles and lines are moved. The only exception to this item will be during periods of blasting when HV power	<ul style="list-style-type: none"> <li>Contractor to implement mitigation</li> <li>Engineer to routinely monitor</li> </ul>

<b>Table 3: BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP Construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		lines will be switched off for safety.	Contractors activities.
<b>Waste and Spoil</b>	Spoil	Under no circumstances shall the Contractor dump excess materials on private lands without permission of the owner and approval from the Engineer. In addition, excess spoil shall not be dumped or pushed into rivers at any location unless in low volumes and agreed upon with the Engineer and with approval from the NRA.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• NRA to approve any waste disposal to the River.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Inert Solid & Liquid waste	The contractor shall be responsible for the following: <ul style="list-style-type: none"> <li>• Provide refuse containers at each worksite;</li> <li>• Maintain all construction sites in a cleaner, tidy and safe condition and provide and maintain appropriate facilities as temporary storage of all wastes before transportation and final disposal;</li> <li>• Train and instruct all personnel in waste management practices and procedures as a component of the environmental induction process, and</li> <li>• Collect and transport non-hazardous wastes to all approved disposal sites. The sites for waste disposal shall be agreed with the local municipal authorities and NRA. A specialized company may be contracted, if available to ensure collection of domestic and general waste from camps and temporary storage areas and transportation to landfills approved and licensed by the NRA.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• NRA to approve any waste disposal site.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
	Asphalt	It is recommended that discussions are undertaken with ARS to determine if it is feasible to re-process the asphalt for use on other local roads throughout the region. If it is determined to be cost effective, the Project should consider procuring equipment for this purpose.	<ul style="list-style-type: none"> <li>• ARS to assess feasibility.</li> </ul>
	Hazardous Waste	Management, handling & storage protocols for hazardous waste will be outlined in the Contractors Waste Management Plan. Disposal locations of hazardous wastes should be agreed with the NRA. The Contractor shall collect hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment or disposal at the temporary storage sites and further at the locations approved by NRA or pass it to the licensed operator having environmental permit on operation of the hazardous wastes.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> <li>• NRA to approve any waste disposal site.</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Health and Safety</b>	Worker Health & safety	The Contractor shall be responsible for provision of: <ul style="list-style-type: none"> <li>• Safety Training Program. A Safety Training Program is required and shall consist of an Initial Safety Induction Course. All workmen shall be required to attend a safety induction course within their first week on Site and Periodic Safety Training Courses.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3: BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP Construction Phase Mitigation</b>			
Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		<ul style="list-style-type: none"> <li>• Safety Meetings. Regular safety meetings will be conducted on a monthly basis and shall require attendance by the safety representatives of Subcontractors unless otherwise agreed by the Engineer.</li> <li>• Safety Inspections. The Contractor shall regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. Lights and signs shall be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately.</li> <li>• Safety Equipment and Clothing. Safety equipment and protective clothing are required to be available on the Site at all material times and measures for the effective enforcement of proper utilization and necessary replacement of such equipment and clothing, and all construction plant and equipment used on or around the Site shall be fitted with appropriate safety devices.</li> <li>• First Aid facilities. A fully equipped first aid base shall be climatically controlled to maintain the temperature of the inside of the building at 20 degrees C. Arrangements for emergency medical services shall be made to the satisfaction of the Engineer.</li> </ul> <p>The Contractor shall coordinate with local public health officials and shall reach a documented understanding with regard to the use of hospitals and other community facilities.</p>	
	Sub-contractor H&S	All sub-contractors will be supplied with copies of the SSEMP. Provisions will be incorporated into all sub-contracts to ensure the compliance with the SSEMP at all tiers of the sub-contracting. All sub-contractors will be required to appoint a safety representative who shall be available on the Site throughout the operational period of the respective sub-contract unless the Engineers approval to the contrary is given in writing. In the event of the Engineers approval being given, the Engineer, without prejudice to their other duties and responsibilities, shall ensure, as far as is practically possible, that employees of subcontractors of all tiers are conversant with appropriate parts of the SSEMP.	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors and sub-contractors activities.</li> </ul>
	HIV / AIDS	The Contractor shall subcontract with an Approved Service Provider to provide an HIV Awareness Program to the Contractor's Personnel and the Local Community as soon as	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation.</li> </ul>

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Subject	Potential Impact / Issue	Mitigation Measure	Responsibilities
		practicable after the Contractor’s Personnel arrive at the Site but in any case within two weeks after the Contractor’s Personnel arrive at Site and to repeat the HIV Awareness Program at intervals not exceeding four months	<ul style="list-style-type: none"> <li>• Service Provider to implement training.</li> <li>• Engineer to review program.</li> </ul>
<b>Historical and archeological areas</b>	Impacts to Historical and archeological areas	<p>To avoid potential adverse impacts to historic and cultural resources, the Contractor shall:</p> <ul style="list-style-type: none"> <li>• Adhere to accepted international practice and all applicable historic and cultural preservation requirements of the Government of Azerbaijan, including all appropriate local government entities, and</li> <li>• In the event of unanticipated discoveries of cultural or historic artifacts (movable or immovable) in the course of the work, the Contractor shall take all necessary measures to protect the findings and shall notify the Engineer and the Ministry of Culture. If continuation of the work would endanger the finding, project work shall be suspended until a solution for preservation of the artifacts is agreed upon.</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>
<b>Noise</b>	Construction Noise and Vibration	<p>The Contractor shall ensure provision of the following:</p> <ul style="list-style-type: none"> <li>• Source Controls, i.e., requirements that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken;</li> <li>• Site Controls, i.e., requirements that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible;</li> <li>• Work near Sensitive Receptors shall be limited to short term activities;</li> <li>• Time and Activity Constraints, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the Engineer having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. When operating close to sensitive areas such as residential, nursery, or medical facilities, the Contractor’s hours of working shall be limited to 8 AM to 6 PM;</li> <li>• Community Awareness, i.e., public notification of construction operations will incorporate noise considerations; methods to handle complaints will be specified. Sensitive receptors will be avoided as possible (i.e., aggregate crushers, operators, etc.). Disposal sites and haul routes will be coordinated with local officials;</li> <li>• Use of low volume charges will reduce the potential for vibration induced damage to</li> </ul>	<ul style="list-style-type: none"> <li>• Contractor to implement mitigation</li> <li>• Engineer to routinely monitor Contractors activities.</li> </ul>

<b>Table 3: BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP Construction Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
		structures; and in the event of damage proven to be due to the contractor’s activities, owners of structures will be fully compensated.	

<b>Table 4: BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP Operational and Maintenance Phase Mitigation</b>			
<b>Subject</b>	<b>Potential Impact / Issue</b>	<b>Mitigation Measure</b>	<b>Responsibilities</b>
<b>Air Quality</b>	Air quality impacts from Vehicle movements	Potential impacts due to the use of the new bridges and rehabilitated rural roads are the purview of ARS.	<ul style="list-style-type: none"> <li>• ARS to monitor air emissions during the operational phase of the Project</li> </ul>
<b>Soils</b>	Erosion	Contracts stipulated that the Contractor shall be liable for a one year defects liability period. During this year the NRAs should undertake regular observational monitoring of the Project Road to ensure that engineering works and vegetation growth have prevented erosion impacts. If the NRAs discover any potential issues they shall report their findings to the ARS who shall then make the Contractor responsible for final improvements. Final payments can not be made until outstanding issues are resolved	<ul style="list-style-type: none"> <li>• NRAs to monitor vegetation growth and erosion impacts during defects liability period.</li> </ul>
<b>Hydrology</b>	Impacts to hydrology and water quality as a result of construction activities.	Contracts stipulated that the Contractor shall be liable for a one year defects liability period. During this year the locals NRAs should undertake regular water quality monitoring and routine observational monitoring of construction areas close to the 3 Rivers affected and its tributaries to ensure that the road works are not having any continuous impacts upon the hydrological conditions of the region. If the NRAs discover any potential issues they shall report their findings to the ARS who shall then make the Contractor responsible for final improvements. Final payments can not be made until outstanding issues are resolved.	<ul style="list-style-type: none"> <li>• NRAs to monitor water quality during defects liability period.</li> </ul>

<b>Table 5</b>					
<b>BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP: Pre-construction Phase Instrumental Monitoring</b>					
<b>Issue</b>	<b>Mitigation</b>	<b>Locations</b>	<b>Schedule</b>	<b>Responsibilities</b>	<b>Reporting</b>
Water Quality Impacts due to construction works	The Contractor shall undertake baseline instrumental monitoring during the Pre-construction phase. Parameters to be monitored to establish a baseline include: <ul style="list-style-type: none"> <li>• Total Suspended Solids (TSS)</li> <li>• Biological Oxygen Demand (BOD)</li> <li>• Dissolved oxygen (DO)</li> <li>• Fecal coliform</li> <li>• Oil and grease</li> </ul>	Baseline monitoring locations include: <ul style="list-style-type: none"> <li>• 50 meters down stream of each borrow pit locations;</li> <li>• 50 meters downstream of the Aghsafa River Bridge.</li> </ul> In addition, the Engineer may also recommend additional monitoring locations during baseline monitoring and during construction. However, as an indicator the number of sampling locations, including the baseline locations, should not exceed ten.	Water quality baseline monitoring shall be carried out as soon after the date of acceptance of the Bid as practicable to determine ambient levels of the pollutants at the specified monitoring locations which will be identified in the SSEMP.	The Contractor shall engage a third party monitoring agency to undertake the baseline monitoring. The Agency shall be approved by the NRA.	The Agency shall provide his results to the Contractor and Engineer prior to the start of Project works.
Air quality	The Contractor shall undertake baseline instrumental monitoring during the Pre-construction phase. Parameters to be monitored to establish a baseline include: <ul style="list-style-type: none"> <li>• Total Suspended Particulates (TSP)</li> <li>• Sulfur Dioxide (SO<sub>2</sub>)</li> <li>• Nitrogen Dioxide (NO<sub>2</sub>)</li> <li>• Carbon Monoxide (CO)</li> </ul>	The recommended baseline monitoring locations include 1 location at each construction site or every 10 Km on rural roads. In addition, the Engineer may also recommend additional monitoring locations during the baseline monitoring. However, as an indicator the number of sampling locations should not exceed ten.	Air quality baseline monitoring shall be carried out as soon after the date of acceptance of the Bid as practicable to determine ambient levels of the air pollutants at the specified monitoring locations which will be identified in the SSEMP.	The Contractor shall engage a third part monitoring agency to undertake the baseline monitoring. The Agency shall be approved by the NRA.	The Agency shall provide his results to the Contractor and Engineer prior to the start of Project works.

**Table 6**

**BRIDGE No. 4, Y-05-08, POYLU –DUZQISLAQ –. QAZAX ROAD; KM 0+100: EMP: Construction Phase Instrumental Monitoring**

<b>Issue</b>	<b>Mitigation</b>	<b>Locations</b>	<b>Schedule</b>	<b>Responsibilities</b>	<b>Reporting</b>
<b>Air Quality</b>	The Contractor shall establish routine Air Quality Monitoring throughout the construction period. The following parameters shall be monitored: (TSP), Sulfur Dioxide (SO <sub>2</sub> ), Nitrogen Dioxide (NO <sub>2</sub> ) and Carbon Monoxide (CO). Other parameters maybe warranted as and when requested by the Engineer.	At the locations of the baselines monitoring and at any additional locations to be determined by the Engineer (not to exceed ten per monitoring period).	Monitoring to be undertaken once every three months	The Contractor shall hire an independent monitoring consultant to perform the monitoring activities.	The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.
<b>Surface Water Quality</b>	The Contractor shall ensure that routine surface water monitoring is undertaken throughout the construction period. Measured water quality parameters shall include <ul style="list-style-type: none"> <li>• Total Suspended solids (TSS)</li> <li>• Biological Oxygen Demand (BOD)</li> <li>• Dissolved oxygen (DO),</li> <li>• Conductivity - Fecal coliform</li> <li>• Oil and grease</li> </ul>	Locations will be determined in consultation with the Engineer and the NRA and shall include the baseline locations above and any other likely to be subject to water quality impacts or significant runoff (construction camps, staging areas, etc.).	Monitoring to be undertaken bi-monthly	Responsibilities – The Contractor shall hire an independent air quality monitoring consultant.	The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.
<b>Noise</b>	The Contractor shall ensure that routine noise monitoring is undertaken throughout the construction period. Parameters to be monitored to establish a baseline include: Laeq 1h (dBA)	Locations will be determined in consultation with the Engineer and the local NRA	Bi-Monthly throughout construction.	The Contractor shall hire an independent noise monitoring consultant.	The Independent Specialist shall provide his results to the Contractor and Engineer within three days of the sampling activity.