

REPUBLIC OF IRAQ

**MINISTRY OF CONSTRUCTION AND
HOUSING & PUBLIC MUNICIPALITIES**

ROADS AND BRIDGES DIRECTORATE

**Emergency Operation Development Projects (EODP)
(P155732)**

Rehabilitation & Reconstruction

of

Al- Dhuluiya Big and Small Bridges and Approaches.

**SITE SPECIFIC
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT
(Limited ESIA)**

July 2016

List of Acronyms

AIM:	Audit and Inspection Manager
ESIA	Environmental and Social Impact Assessment
ESMP:	Environmental and Social Management plan
GOI:	Government of Iraq
GRM:	Grievance Redress Mechanism
IEODP:	Iraqi Emergency Operation Development Project
L.S:	LUMP SUM
MOCHPM:	Ministry Of Construction housing and Public Municipalities
MOHE:	Ministry of Environment
MSDS:	Material Safety Data Sheets
OP:	World Bank Operational Policy
PAPs:	Project Affected Peoples
PPE:	Personal Protective Equipment
RBD:	Road and Bridges Directorate
RE:	Resident Engineer
TOR:	Terms of Reference
WB:	World Bank

EXECUTIVE SUMMARY

INTRODUCTION

According to the ESMF which has been prepared for the EODP, a *limited site specific* Environmental and Social Impact Assessment (ESIA) should be prepared, cleared and publically consulted upon prior to the commencement of any construction activities for the roads and bridges component.

This ESIA was developed to cover the activities associated with the rehabilitation and operation of **AL-Dhuluiya small and big bridges**. The ESIA identifies key environmental and social impacts of the project activities during both the rehabilitation and the operational phases, and defines the necessary mitigation measures addressing potential negative impacts, as well as monitoring procedures during construction and operation. The ESIA study was carried out according to requirements of the current environmental regulations of the World Bank (OP 4.01), and Iraqi regulations. In this report the WB, and Iraqi environmental and social standards and regulations were followed to ensure the national and international acceptance and compliances of the ESIA. An Environmental and Social Management Plan (ESMP) is prepared and embedded in this ESIA which should be followed and implemented by all relevant parties.

ESIA Objectives

The objectives of this site specific ESIA are to provide:

- Practical and achievable actions to ensure that the project's adverse environmental and social impacts are properly mitigated.
- An integrated plan for monitoring, assessing and controlling potential impacts.
- Support to Local and State authorities to enable setting approval conditions for the project based on relevant standards and procedures.
- Focus on positive aspects and benefits, mitigate negative impacts and avoid serious and irreversible damage to the environment and people
- An opportunity for holding consultation with the communities to get their input on the project activities.
- Information to the local community about the revised project activities and the environmental measures, socio-economic measures, information on residents' rights who might be negatively affected by some project activities and bridge operations,
- Information to the local community of the existence of a grievance redress management (GRM) system through which they might lodge complaints and expect prompt and fair consideration.

This ESIA establishes a framework for the identification of environmental and social protection, mitigation, monitoring measures to be taken during rehabilitation and operational phases of the project. The ESIA includes project description, mitigation measures, monitoring plan, management plans schedule, institutional arrangements, and public consultation. The ESIA will aim to achieve a good environmental and social performance during construction and maintenance. To meet this goal, the following activities, measures and programs must be followed:

- (i) Environmental regulations

- (ii) Application of all environmental and social mitigation and management measures.
- (iii) Environmental and social monitoring plan.
- (iv) Emergency and contingency plan.
- (v) Institutional plan.
- (vi) Environmental and safety measures.
- (vii) Effective and open consultations with local communities.

Environmental and social monitoring is an important component of the ESIA. It provides the information for periodic review and refinement modification of the ESIA as necessary, ensuring that environmental and social protection is optimized in all project phases through monitoring and early detection and effective remediation of unwanted environmental and social impacts. Lastly, it will also demonstrate compliance with national and international regulatory requirements.

PROJECT DESCRIPTION

Introduction

In district of Al -Dhuluiya in Salah Ad- Din Governorate. Connect district AL-Duluiya with Balad City, Improving the governorate status going on with the quality development human and commercial activities, Improve navigation on water way. The main aims of the project is the Reconstruction of Al-Dhuluiya Big and Small Bridges and Approaches in Salah- Ad- Din Governorate to facilitate travel and commerce and access to essential service including health care and education and movement of agricultural products. At this time there are two steel panel bridges had been installed on damaged spans of Al-Dhuluiya big and small bridges which had been installed by Iraqi military engineering to operate the bridges for temporary situation and it will be transferred to the RBD when the reconstruction starts for the two bridges, so Al-Dhuluiya main road can be used as an alternative route with length of 8 Km passing through Al-Duluiya floating bridge.

Beneath the bridge there is water canal, this canal is used by the locals for different purposes at least from the population adjacent to the canal bank. The current status of the bridges is totally damaged and it cannot be used as a passage. The adjacent area to the bridge can be used for erection of the contractor camp and facilities, all the area adjacent to the bridge are state owned land. The proposed contractor camp area will be erected in the area owned by the government and not interfere with any private property.

Project Location

The project is located in the district of Al -Dhuluiya in Salah Ad- Din Governorate.

Purpose of the project

The purpose of the bridges is to connect district AL-Duluiya with Balad City, Improving the governorate status going on with the quality development human and commercial activities, Improve navigation on water way. The main aims of the project is the Reconstruction of Al- Dhuluiya Big and Small Bridges and Approaches in Salah- Ad- Din Governorate to facilitate travel and commerce and access to essential service including health care and education and movement of agricultural products. At this time there are two steel panel bridges had been installed on damaged spans of Al-dhuluiya big and small bridges which had been installed by Iraqi military engineering to operate the bridges for temporary situation and it will be lifted from them when the reconstruction start for the two bridges, so Al-dhuluiya main road can be used as an alternative route with long 8 Km passing through Al-duluiya floating bridge as shown in the aerial photograph bellow.

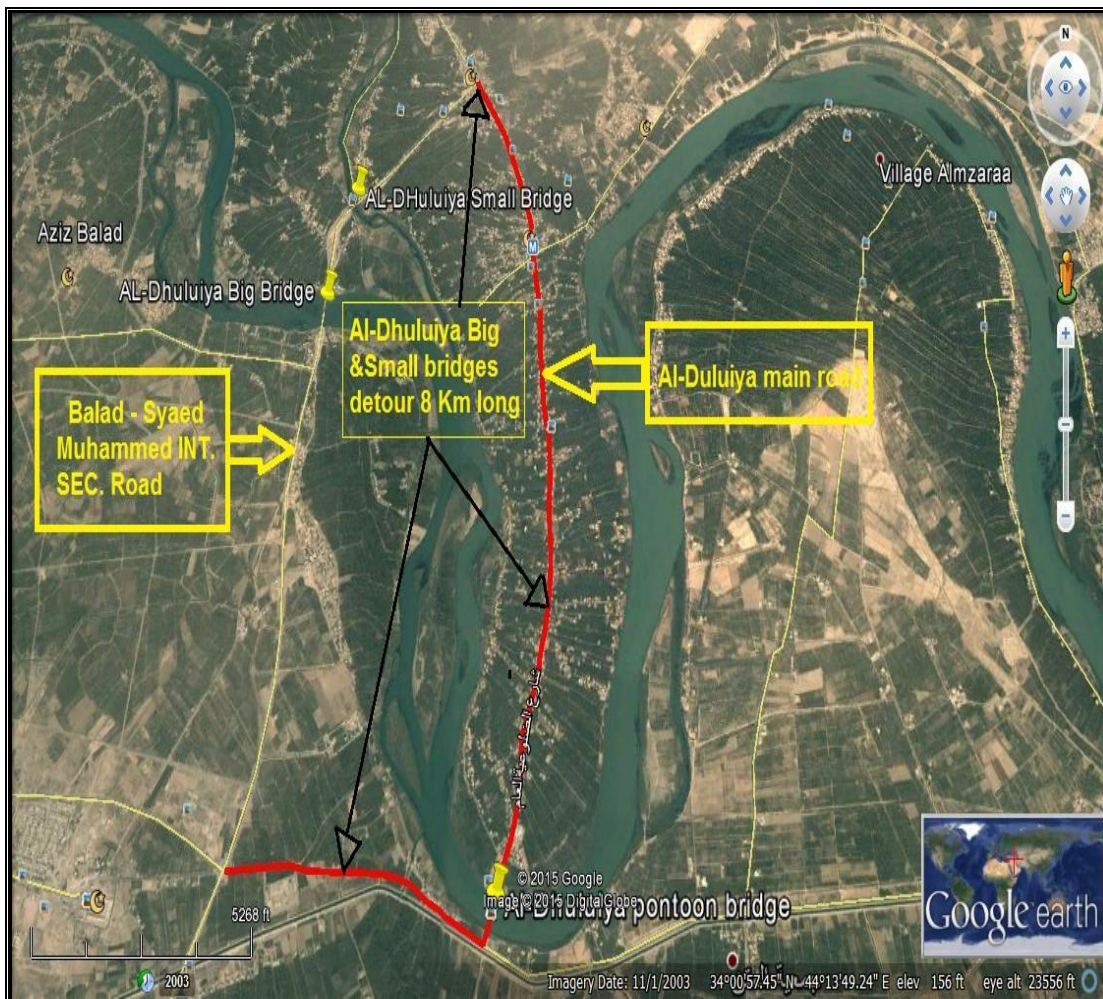


Figure 1: Aerial photo of Al-Dhuluiya big and small bridges location

Anticipated construction activities, equipment and facilities

Construction activities

- Removal of the existing steel structure which has been installed as a temporary span to enable the traffic to flow (on the bridge).
- Removal of the destroyed span, (sinking partially) in the river. & as monitored by the RE.
- Demolition of the destroyed span and removal of all the material (gravel steel bars) to the dumping area assigned by the municipality for Al-Dhuleya and approved by the RE.
- Removal of the all the six rubber pads, from site, whenever it is, then transfer, dump it in approved disposal sites;
- Grinding of the asphalt surface layer for the cracked portion of the two ramps, and any other place on the deck slap of the bridge, & transfer (the rubble, gravel, Sand. Remaining of the asphalt) in approved disposal sites.
- Installing the new steel girders as a substitute for the destroyed original concert span, welding and painting each member.
- Arranging to cast reinforced concrete with not less than 30 cm on the steel girders.

- Arranging for the final pavement for the new deck slab & also sealing the other damaged portion of the bridge.

Construction equipment

The following is a description of the types and numbers of construction equipment which are expected to be used in execution on both sites and the estimated number of days which they will operate.

#	Type of Equipment	Quantity (for 2 sites)	Operation Period (per site)
1	30 – ton crane	2	30days
2	Compressor (diesel) 370 Airman	2	30 days
3	Jack – hammer (low noise)	2	7 days
4	Shovel (kawsaki 70) or equivalent	2	6 months
5	Typical lorry with tipping, skipping Body to load of transport the demolished material	4	2 days
6	Truck mixer	4	3 days
7	Asphalt grinder	1	4 days
8	Bitumas tanker	1	4 days
9	Asphalt finisher	1	8 days
10	Compactor (steel & rubber tube)	2	8 days
11	Welding machine (set)	2	4 months
12	Diesel generator 30 K.V.A	2	12 months
13	Grader (komatsu)	1	11 months
14	Pickups & sedan cars	2	12 months
15	Air shot, bell, bugger	2	12 months

As shown above, the duration of construction will last for 12 months as planned.

Construction site facilities

Each construction site, offices for the site engineers (RE and Environmental Manager) equipped with air conditioning and toilet facilities will be on site. In addition rest areas and restrooms for the construction workers will be available. All these needed constructional facilities will be erected in a fully state owned land, no procedures will be needed for an extra land acquisition for this purpose.

Potable water tanks will be provided and septic tanks will be constructed for disposal of human sewage

BASELINE CONDITIONS

The Project Area

Tikrit city and its suburban area have a long historic background of several years as part of the Mesopotamia civilization. The principle agricultural activity in the area is different crops. Farming, some industrial activities are the major economic activity in Tikrit. Tikrit is a major core city and has satellite towns and villages located within the administrative border line. On the left bank of the bridge there are open areas. On the right bank, houses are located far from the project location. There are few houses in the area surrounding the bridge and on the distance more than 400 m of the project location. The project area is almost an open area with some farms located far from the project, with the major palm tree implantation.



Figure 2: General Location Map

Environmental and Social Baseline conditions

The environmental baseline section is presented to give clear overview of the environmental and social conditions in the vicinity of the project location prior to commencement of works. The elements of the environment include: climate and meteorology, air quality, surface and groundwater quality, river sediment and soil, topography, noise and vibration levels, traffic, rivers and waterways, biodiversity including flora, fauna, rare or endangered species, and sensitive habitats. It also includes consideration of socio-economic characteristics (such as population, land-use, planned development activities, community

structure, employment, distribution of income, goods and services, recreation, cultural properties, customs, and attitudes.

Climate

Salah Ad-Din governorate is located in the northern mid-west part of Iraq, and has a diverse climate. The major rain fall during November, December, January, February, with a spread showering in March. Highest temperatures in July and August reach over 48 degrees centigrade. Rainfall is normally recorded during the months of December to January.

Rainfall, wind velocity and temperature

According to the Iraqi national meteorological commission, the average seasonal annual rainfall is less than 85mm. According to the (environmental survey statistics/ Ministry of planning 2012) records, in 2012 the annual precipitation in Salah Ad-Din governorate was 67mm.

Air Quality

There is no monitoring station close to the site. The data shows no increasing of the maximum permissible concentrations for SO₂, NO₂ and CO. As Al- Duhulyia Bridge is located in an open area, so the expected concentration of these pollutants will be low, furthermore, as the bridge is in an open area good ventilation and dispersion of any air pollutants will be expected.

Site Topography

The project sites area represents an extension of the flat areas that starting from the middle of Iraq till the mid-southern parts of the country. No natural land obstacles are presented in the project area. The area is free of mountains, cliffs, and valleys.

Land use

The land use of area surrounding the project is mostly in use as for agricultural purposes, although, a number of a scattered houses were noticed within a distance less or equal to 400m from the project.

Seismic Activities

No Seismic activities had been recorded for more than 40 years.

Floods

In the some spring season the canal beneath the bridge will work as a drain channel (with a low water flow). In general, there are no hazards of flooding which were recorded previously or expected in the future.

Traffic Level

The traffic level is currently moderate where many vehicles use the temporary bridge facility to connect from/to Al-Dhuluiya city. Due to the nature of the existing temporary installation, the traffic moves slowly especially before crossing over the bridge.

Noise

Except for the existing normal traffic, no other sources of noise are in the area. At night, no traffic exists after darkness.

Heritage Environment

The rehabilitation of the bridge does not pass through any historical, cultural sites. There are no sites of historical or cultural importance in the area, and therefore the rehabilitation and operation of the plant will have no impact on archaeology or cultural heritage. No cemeteries, historical-cultural monuments, churches, mosques near the project need to be removed in order to rehabilitate the bridge.

Land Acquisition

In this project, as the bridge was already existing (not a new constructional activities), no additional land needed to be purchased, to allow rehabilitation works. There are no livelihoods in the project vicinity that are likely to be adversely affected by the project, hence neither involuntary nor voluntarily relocation of people is necessary or expected.

Social Aspects

There are no villages, residential complexes or community structures in close proximity to the bridge. The bridge is being constructed on state land, and no land or property expropriation is necessary. No roadside vendors, either licensed or non-licensed were found. The approaches areas on either side of the bridge are not settled on or utilized by any of the local population. All the areas around and within the site remain clear of any settlement or economic use and are ready for rehabilitation works, no interference were registered from the local community which is eager for the works to be completed. One of the major necessities of the locals in the area is to have a good accessible bridge. During implementation stage, traffic will use the Al-Dhuluiya main road as an alternative route which is about 8km passing through Al-Dhuluiya floating bridge.

LEGAL REQUIRMENTS

Iraqi environmental legislations

The work during rehabilitation and operation must follow the Iraqi laws and regulations for the environmental standards. The following Table represents the applicable Iraqi's laws applicable to such activity.

Table E1: Applicable Laws and Regulations in Iraq

Applicable Iraqi laws
Law no. 37 of 2008 for Ministry of Environment: Describes institutional arrangements of the Ministry of Environment and Outlines policies and roles and responsibilities toward protecting the environment.
Set of instructions issued by the Ministry of Health: Contamination Limits in Pursuance of Law no. 25 of 1967 for Protection of Rivers.
Law no. 27 of 2009 for: Protection and Improvement of Environment
Regulations no. 2 of 2001 for: Preserving water resources.

It should be noted that legislation relating to social safeguards issued in Iraq since 2003 has focused primarily on the ratification of international conventions and protocols on issues such as cultural heritage. As yet there are no formally adopted requirements for social assessments relating to road works. Hence, social safeguards issues remain very largely uncovered except to the extent they are referred to under environmental laws.

The World Bank Safeguards Policies

In addition to the Iraqi laws and regulation the ESIA follows two key policies and procedures of the World Bank, The following table represents the needed World Bank operational policies which are relevant to the rehabilitation of the bridges.

1. OP/BP 4.01 - the key Operational Policy describing the environmental assessment procedure. The Bank requires environmental assessment of projects proposed for Bank financing. The objectives of the EA are to:

- a. Ensure that projects proposed for Bank financing are environmentally and socially sound and sustainable.
- b. Inform decision makers of the nature of environmental and social risks.
- c. Increase transparency and participation of stakeholders in the decision-making process.

2. OP/BP4.12 the key Operational Policy describing the involuntary resettlement which focuses on the following principles:

- Involuntary resettlement is avoided wherever feasible, or minimized, exploring all viable alternative project designs;
- Where it is not feasible to avoid involuntary resettlement, activities are conceived and executed as sustainable development programs. Displaced persons are to be meaningfully consulted and have opportunities to participate in the planning and implementing of resettlement programs affecting them; and
- Displaced persons are assisted in their efforts to improve their livelihoods and standards of living, or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. The mechanism of assisting displaced persons is based on full and prior mitigation and compensation for loss of assets or livelihoods.
- OP 4.12 applies whenever, in a Bank-financed project, land is acquired involuntarily or access is restricted in legally designated parks or protected areas.

Bank procedures require that Grievance Redress Mechanisms (GRMs) be established and operational prior to commencement of the project, and that they continue to operate for one year following completion of the works. A checklist of issues to be considered in the design of the GRMs includes the following:

- An inventory of any reliable conflict mediation organizations or procedures in the project area is undertaken and an assessment made to determine if any of these entities or procedures might be used, ensuring that complaints were received and addressed in an effective, timely and transparent manner.

Good practice is to ensure that PAPs can apply orally and in the local language and to impose explicit time limits for responding to grievances received. Appeal procedures need to be specified, and this information is made publicly available therefore, allow for both verbal and written grievances to be lodged with the local project authorities, who will transmit these to the local level committee for review, consideration and response.

World Bank Group Environmental Health and Safety (EHS)

The Iraqi requirements on EHS are quite stringent and match, to a large extent, the international best practices on EHS. The World Bank Group Environmental, Health, and Safety (EHS) Guidelines: GENERAL EHS GUIDELINES: CONSTRUCTION AND DECOMMISSIONING, provides specific guidance on EHS requirements for construction related activities (Chapter 4). This includes EHS aspects related to:

- a) Environment
 - Noise and Vibration
 - Soil Erosion
 - Air Quality
 - Solid Waste
 - Hazardous Materials
 - Wastewater Discharges
 - Contaminated Land
- b) Occupational Health and Safety

c) Community Health and Safety

- General Site Hazards
- Disease Prevention
- Traffic Safety

IMPACT ASSESSMENT AND MITIGATION MEASURES

Rehabilitation Phase

This section of the report describes the environmental and social impacts that are likely to result from the construction and rehabilitation of the big and small bridges, and the mitigation measures addressing them.

The Environmental actions, procedures and responsibilities as required during the construction phase must comply with the available specifications, legislation, laws issued by the MOHE.

The construction contractor(s) will be responsible for compliance with the ESIA provisions during the rehabilitation phase of the project. The contractor will be also in charge of undertaking work in a manner which complies with all relevant environmental procedures, adheres to all legislative requirements, and ensures that all environmental objectives associated with the contract are achieved.

Table E 2: Summary of Impact Assessment Matrix – During Construction / Rehabilitation

	Environmental Receptor	Impact Significance
1	Air Quality	Low
2	Noise	Low
3	Water Resources	Medium
4	Soil	Low
5	Solid and hazardous wastes	Medium
6	Flora & Fauna	In significant
7	Topography and landforms	In significant
8	Impacts on local traffic	Medium
9	Health and Safety	High
10	Socio-Economic impacts	Medium

No significant negative environmental or social impacts are anticipated during the operation phase.

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Mitigation measures, responsibilities and estimated associated costs

The Resident Engineer will be assisted by a team of environmental and social officers who will be responsible for supervising the daily activities of the contractor and will report non-compliances to the Resident Engineer in order to take necessary actions towards the contractor. Regular supervision site visits will also be conducted by the RBD PMT environmental/social officer in association with a qualified environmental and social consultant who will provide technical advice in case there is a need to modify or add new mitigation measures as work necessitates.

The costs of mitigation measures are estimated based on the average market rates for similar activities in Iraq and can be used as indicative costs. It is the sole responsibility of the contractor to estimate the costs associated with the recommended mitigation measures based on his work experience.

The following tables summarize the mitigation measures which are required to be undertaken to avoid any negative impacts on the environment. Responsibilities and estimated costs are also presented.

Table E 3: Mitigation Measures for Al- Dhuluiya Construction/Rehabilitation Phase.

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
1	Air quality	<ul style="list-style-type: none"> - Unpaved roads, e.g. detours to access the construction site, especially passing through or close to farmlands, the temporary detour will be nearby the site, no damages will be occurs to any farmlands, houses or any private or non-private facility due to the construction of the detour, which may be utilized for construction vehicles movement or transportation of construction materials should be prepared in a way to avoid dust emissions. A sub base layer of 15 cm and wet compaction should take place to get sufficient compaction to avoid dust emissions. The detour should always be maintained in good conditions. - The detour(s) should always be maintained in good conditions. - Watering or increase of the moisture level of the open materials storage piles to reduce dust levels; - enclosure or covering of inactive piles to reduce wind erosion; - loads in all trucks transporting dust-generating materials have to be sprayed with water to suppress dust, as well as wheels of means moving inside and outside of the construction-site; and - speed reduction for vehicles approaching the site to less than 40 km/hr. On site, speed should not exceed 20 km/ht. 	Contractor	Resident engineer	3000
		<ul style="list-style-type: none"> - Engines of vehicles and other machinery are kept turned on only if necessary, avoiding any unnecessary emission; - Machines and equipment are periodically checked and maintained to ensure their good working condition; - All equipment and machines must be maintained and tested for compliance with standards and technical regulations for the protection of 	Contractor	Resident engineer	Included in contractor cost

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		the environment and have appropriate certifications; - Activities are carried out using the minimum required number of means at the same time; and - Electric small-scale mechanization and technical tools are used when available and feasible;			
		Limit vehicle speed limits to be the minimum (less than 40 km/hour) near residential buildings and farmlands.	Contractor	Resident engineer	Included in contractor cost
2	Noise	Construction activities are to take place within reasonable hours during the day and early evening. Night-time activities near noise sensitive areas, such as residential buildings, should not be allowed.	Contractor	Resident engineer	Included in contractor cost
		- Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. - Equipment to run only when necessary; and - Positioning of the noise sources in a concealed area with respect to acoustic receptors, consistent with the needs of the construction site.	Contractor	Resident engineer	Included in contractor cost
		Use of personal protection equipment for workers especially those who use jack hammers or near noisy engines or compressors.	Contractor	Resident engineer	2000
3	Water resources	Damaged sections of the bridge which are immersed in the river should be carefully removed without polluting the river water.	Contractor	Resident engineer	Included in contractor cost
		Wastewater from the worker rest areas or construction offices should be contained in solid containers and should be removed regularly from site by means of authorized contractors.	Contractor	Resident engineer	8000

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		In case of the need to change engine oils or refuel some construction equipment, a proper maintenance workshop or shelter should be installed to ensure containment of any fuel or oil spills.	Contractor	Resident engineer	3000
		<ul style="list-style-type: none"> - In case of using septic tanks on site, the engineering drawings of these tanks should be presented to the Resident Engineer for approval. - No solid wastes are to be thrown into the river. - Use of paints or chemicals should be done away from the river. However, if non-avoidable, excessive precautions should be undertaken to avoid spillages into the river water. 	Contractor	Resident engineer	Included in contractor cost
4	Soil	<ul style="list-style-type: none"> - To prevent soil contamination by oil/grease spills, leakages or releases, all manipulations of oil derivatives in the process of construction and provision of the fuel to the machines should be performed with maximum care; leak proof containers should be used for storage and transportation of oil/grease and wash off from the oil/grease handling area shall be drained through drains and treated appropriately before disposal; - Construction waste and debris shall be collected on a regular basis and disposed of at designated landfills; - Only authorized quarries shall be used for purchasing soil to be used for embankment, padding, bedding, backfilling during construction; and - It must be prohibited to operate equipment and vehicles outside the designated work areas and roads. 	Contractor	Resident engineer	Included in contractor cost
		<ul style="list-style-type: none"> - No hazardous waste storage to take place directly on soils. Appropriate and enclosed containers should be utilized. 	Contractor	Resident engineer	1000

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
5	Solid and hazardous wastes	<ul style="list-style-type: none"> - Minimize waste generation on site. - Simple waste management plan for specific waste streams must be developed. - General waste must be collected and transported to local council approved disposal sites. - Food wastes must be collected, where practicable, considering health and hygiene issues, for disposal off-site through licensed contractors. - Waste containers must be located at each worksite. - Chemical wastes must be collected in 200 liter drums (or similar sealed container), appropriately labeled, for safe transport to an approved chemical waste depot or collection by a liquid waste treatment service. - Storage, transport and handling of all chemicals must be conducted in accordance with all legislative requirements, through licensed contractors and in coordination with the local authority. - All hazardous wastes must be appropriately stored in bounded areas and should be clearly identified as “hazardous”. - Transportation and disposal of hazardous wastes should be done through licensed contractors and in close coordination with the relevant local authority and in compliance with the legal requirements and instructions of the coordination with the as ministry of science and technology. - Hazardous liquids, such as solvents, rust proofing agents and primer must be managed in accordance with the requirements of relevant legislation and industry standards. - A hazardous materials inventory for the construction period must be prepared. - Material Safety Data Sheets (MSDS) for hazardous materials must be 	Contractor	Resident engineer in coordination with the local authority and ministry of science and technology regarding hazardous wastes	6000

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		<p>available on-site during construction and made available and explained to workers.</p> <ul style="list-style-type: none"> - Hydrocarbon wastes, including lube oils, must be collected for safe transport off-site for reuse, recycling, transport or disposal at approved locations. 			
6	Flora & Fauna	Not Applicable	Not Applicable	Not Applicable	Not Applicable
7	Topography and landforms	Not Applicable	Not Applicable	Not Applicable	Not Applicable
8	Traffic	<ul style="list-style-type: none"> - Provide information, through appropriate signage, to the bridge users to use the alternative route; - Upgrade the alternative route to be able to receive the additional number of vehicles. - Clear traffic signs and signs signals must be installed on-site to provide for safe traffic - Where practicable, truck deliveries must be restricted to daytime working hours. - Dangerous goods must be transported along routes preferred for dangerous goods, - Clear traffic signs and signs signals must be installed on-site to provide for safe traffic. 	Contractor in coordination with the Local Traffic Department	Resident Engineer	500

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
9	Health and Safety	- Limit speed of construction vehicles and provide road signage for drivers and local community.	Contractor	Local traffic department in coordination with the Resident engineer	1000
		- Qualified personnel must be employed for the construction equipment, and personnel must be trained for health and safety issues. - Personal protection equipment such as eyeglasses, gloves, hard heads and safety belts must be supplied and continuously used by all workers, technicians, engineers and site visitors.	Contractor	Resident engineer	3000
		- compliance with international standards for good construction practices; - adherence to local and international guidance and codes of practice on Environmental Health and Safety (EHS) management during construction; - management, supervision, monitoring and record-keeping; - implementation of EHS procedures as a condition of contract with contractors and their sub-contractors; - clear definition of the EHS roles and responsibilities of the companies involved in construction and to individual staff (including the nomination of EHS supervisors during construction and an EHS coordinator during operation); - pre-construction assessment of the EHS risks and hazards associated with construction and operation, including consideration of local cultural attitudes, education level of workforce and local work practices; - provision of appropriate training on EHS issues for all construction and operation workers, including initial induction and regular refresher training, taking into account local cultural issues; - provision of health and safety information;	Contractor	Resident engineer	Included in contractor cost

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		<ul style="list-style-type: none"> - regular inspection, review and recording of EHS performance; - maintenance of a high standard of housekeeping at all times. 			
		<ul style="list-style-type: none"> - Any accidents to be reported and treated within site as a first aid procedure. - Safety training for the workers. - Fuel and oil changing shelters should be equipped with necessary firefighting and safety equipment - First aid items should be available all times onsite and trained staff on emergency aids should be identified. 	Contractor	Resident engineer in coordination with health and safety officials.	2500
10	Handling Complaints	- A complaints register will be kept on site and this will feed into the GRM. Details of complaints received will be incorporated into the audits as part of the monitoring process.	Resident Engineer	RBD/PMT	Included in contractor cost
Total cost US\$ (rehabilitation phase)					30,000

Table E4: Mitigation Measures for Al- Dhuluiya Operation Phase.

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
1	Air quality	During the license issuance or renewal process of vehicles, traffic authorities should ensure that all vehicle engines are in good conditions.	Traffic Department	Traffic Department	No cost
2	Noise	During the license issuance or renewal process of vehicles, traffic authorities should ensure that all vehicle engines are in good conditions. Speed limits should be reduced especially near residential buildings. Limit trucks movement especially at night in coordination with the local traffic authorities.	Traffic Department	Traffic Department	No cost
3	Water resources	Not applicable	Not applicable	Not applicable	Not applicable
4	Soil	Not applicable	Not applicable	Not applicable	Not applicable
5	Solid and hazardous wastes	During the operational period, some littering and waste generation resulting from the repair activities will occur. Littering may occur due to wind action.	Local Authority (Municipality)	Local Authority (Municipality)	Within municipal budget
6	Traffic	Speed limits and road signs should be in place to prevent or minimize the road accidents.	Traffic Department	Traffic Department	No cost
		The bridge must be provided with suitable post lighting at night to reduce the probability of road accidents.	RBD	RBD	Within RBD budget
7	Flora & Fauna	Not Applicable	Not Applicable	Not Applicable	Not Applicable
8	Topography and landforms	Not Applicable	Not Applicable	Not Applicable	Not Applicable
9	Traffic	Improved traffic conditions	Local Traffic Department	Resident Engineer	No Cost
10	Handling Complaints	The continued operation of a GRM for one year following opening of the bridge for use will ensure that local community members have an accessible, fair and transparent means of reporting any emerging adverse impacts, and a means of obtaining mitigation.	RBD/PMT	Local authorities	No cost
Total cost US\$ (Operation phase)					No Cost

ENVIRONMENTAL AND SOCIAL MONITORING PLAN

Environmental and Social Monitoring

In order to ensure full compliance of the performed activities to the environmental and social requirements, regular monitoring should be performed.

To ensure the proper implementation of the environmental and social mitigation measures, an environmental and social monitoring program has been established for the construction phase.

Table E 5: Monitoring Activities for Al- Dhuluiya Rehabilitation Phase.

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimate
1	Air quality	Investigate dust complaints from workers and residents Visual inspection of vehicles and equipment operating or entering the site Measurements of exhaust emissions (CO, SO _x , NO _x , PM ₁₀ , PM _{2.5})	Recorded and documented complaints Recorded status of equipment and vehicles on site (excessive black or white smoke)	Daily visual inspection Monthly measurements	Engineer	PMT	12,000
2	Noise	Investigate noise complaints from workers and neighboring communities in the affected locations Measure ambient noise near sensitive receptors (dBA)	Recorded and documented complaints	Weekly inspection of complaints Monthly noise measurement	Engineer	PMT	6,000
3	Water resources	Investigate implementation of mitigation measures and observe any oil or fuel spills. Investigate wastewater disposal measures Water samples (pH, TDS, TSS, BOD, COD)	Site Investigation report	Daily Investigation Monthly Measurement	Engineer	PMT	12,000
4	Soil	Observe any soil contamination with oil or fuel Observe any accumulation of wastes	Site Investigation report	Monthly	Engineer	PMT	No cost
5	Solid and hazardous wastes	Maintain records on waste types and quantities Observe any waste accumulation in unapproved locations	Waste management contracts with authorized contractors Waste delivery receipts from local authorities.	Weekly Weekly	Engineer	PMT	No cost

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimate
6	Health and safety	Ensure compliance of workers to Health and Safety requirements Maintain log on accidents	Accidents report	Weekly	Engineer	PMT	No cost
7	Flora & Fauna	Record any observation about wild animals or plants on site or nearby and report to the Environmental Authority	Observation report	Upon occurrence	Engineer	PMT	No cost
8	Topography and landforms	No monitoring required	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
9	Traffic	Ensure speed limits and warning signs are installed	Road signs are installed.	Half annual	Engineer	PMT	No cost
10	Handling Complaints	Ensure that the GRM is effective and well communicated	Number of complaints received, analyzed and responded to.	Weekly	Engineer	PMT	No cost
Total cost US\$ (Operation phase)							US\$ 30,000

ESMP Institutional Arrangements

In order to ensure full compliance with the environmental and social requirements which are described above, RBD PMT nominated a qualified engineer to act as the focal point for environmental and social affairs at the central level. On the field level, RBD PMT nominated two engineers in Salah Al-Din to act as environmental and social officers. Those engineers will be trained on monitoring and reporting of environmental and social impacts and how to fill the checklist to be used during field visits before implementation starts.

RBD Resident Engineer will be the officially responsible staff member for ensuring environmental and social compliance. S/He will be assisted by the designated environmental and social field officers.

In addition, a qualified consultant is recruited by the PMT to provide technical assistance and capacity building to the environmental and social team both at the central level and at the field level.

PUBLIC CONSULTATION RESULTS

According to the World Bank policies, it is required that broad and open public consultations be held with PAPs on the project. These consultations are to ensure that the project affected peoples (PAPs) are provided with the opportunity to engage in the rehabilitation planning process, to raise questions and receive input and responses to their concerns.

Due to the current security situation of the area, it was agreed to conduct individual interviews with the local people. Therefore, set of questions were prepared to cover the key environmental and social aspects related to the project. The questionnaire was addressed to a number of the local individuals in the surrounding community randomly to have their opinions and thoughts. To obtain sound and representative information on the possible socio-economic circumstances of the local community members, and better understand any possible adverse socio-economic effects of project activities on PAPs and the local community, local residents were consulted using face-to-face interviews with randomly selected individuals in the vicinity of the bridge and in different areas of the community. The questionnaire forms were distributed in the area for the locals near the bridge in order to reflect their opinion, suggestions, and objections (if exist) regarding the rehabilitation activities.

According to the results revealed from these questioners, the local community individuals agreed that, the rehabilitation activities will have a positive impact on their social daily life. None of the locals expressed any reservations against the project and did not specify any negative impact that might affect him or his family. All locals agreed that the bridge will need some additional safety signs and instructions in order to keep the movement on the bridge within safe conditions. The following are the main findings of the consultation process which took place in April 2016.

1. All questioned locals agreed that the reconstruction activities will have a strong positive impact from the social perspectives on the locals.
2. No claims from any locals were recorded or alleged regarding the ownership of the land where the bridge is constructed; all agreed that it is governmental land property.
3. No vegetation covers, crops, plants, trees... etc. will be removed in order to execute the rehabilitation activities of the bridge.
4. No infrastructure within the bridge area will be affected negatively due to the reconstruction activities.
5. No deportation, dislocation of any of the local community will be needed due to these activities.
6. The reconstruction of the bridge will enhance the social relationship among the locals, improving their transport.
7. All locals agreed that the bridge will need instructional signs for the bridge users' safety.

Contents

List of Acronyms	a
EXECUTIVE SUMMARY	i
1. INTRODUCTION	1
1.1 Objectives	1
2. PROJECT DESCRIPTION.....	3
2.1 Introduction.....	3
2.2 Project Location	3
2.3 Purpose of the project	Error! Bookmark not defined.
2.4 Approaches description:.....	4
2.5 Services lines	6
2.6 Anticipated construction activities, equipment and facilities	6
2.6.1 Construction activities.....	6
2.6.2 Construction equipment	6
2.6.3 Construction site facilities.....	7
3. BASELINE CONDITIONS.....	8
3.1 The Project Area	8
3.2 Environmental and Social Baseline conditions.....	8
3.2.1Climate.....	9
3.2.2 Rainfall, wind velocity and temperature	9
3.2.3 Air Quality	9
3.2.4 Site Topography.....	10
3.2.5 Land use	10
3.2.6 Seismic Activities	10
3.2.7 Floods.....	10
3.2.8 Traffic Level	10
3.2.9 Noise	10
3.2.10 Heritage Environment	10
3.2.11 Land Acquisition.....	11
3.2.12 Social Aspects.....	11
4. LEGAL REQUIRMENTS	12
4.1 Iraqi environmental legislations.....	12
4.2 The World Bank Safeguards Policies	13
5. IMPACT ASSESSMENT AND MITIGATION MEASURES	16
5.1 Construction/Rehabilitation Phase	16
5.1.1 Impacts on Air Quality.....	16
5.1.2 Noise impacts.....	17

5.1.3 Impacts on water resources	18
5.1.4 Impacts on soil	20
5.1.5 Solid and hazardous wastes.....	21
5.1.6 Flora & Fauna	22
5.1.7 Topography and landforms	22
5.1.8 Impacts on local traffic	22
5.1.9 Health and Safety	23
5.1.10 Socio – Economic Impacts.....	24
5.1.11 Land Acquisition.....	24
5.2 Operational Phase	25
5.2.1 Air Quality	25
5.2.2 Noise	25
5.2.3 Water resources.....	25
5.2.4 Soil	26
5.2.5 Solid and hazardous wastes.....	26
5.2.6 Flora & Fauna	26
5.2.7 Topography and landforms	26
5.2.8 Impacts on local traffic	26
5.2.9 Health and Safety	26
5.2.10 Socio-Economic impacts.....	26
6. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN.....	27
6.1 Mitigation measures, responsibilities and estimated associated costs	27
7. ENVIRONMENTAL AND SOCIAL MONITORING PLAN	36
7.1 Environmental and Social Monitoring.....	36
7.2 ESMP Institutional Arrangements	37
7.3 Reporting requirements.....	39
7.4 Capacity Development and Resources Requirements.....	39
7.4.1 Capacity Development.....	39
7.4.2 Required Resources.....	40
8. PUBLIC CONSULTATION RESULTS	41
ANNEXES	42
Annex (1): Grievance Form	42
Annex (2): Questionnaire forms from Public Consultation	44
Annex (3): Site photos	47

List of Figures

Figure 1: Aerial photo of Al-Dhuluiya big and small bridges location v
Figure 2: General Location Map..... viii
Figure 3: aerial photo of Al-Dhuluiya big and small bridges location 4
Figure 4: aerial photo of Al-Dhuluiya small bridge 5
Figure 5: aerial photo of Al-Dhuluiya big bridge 5
Figure 6: Aerial google map showing the surrounding environmental and social setup 8
Figure 7: Damaged span in the big bridge 47
Figure 8: Damaged span in the small bridge (1) 48
Figure 9: Damaged span in the small bridge (2) 49

List of Tables

Table 1: Monthly Mean Wind Speed 9
Table 2: Monthly Mean Temperature 9
Table 3: Maximum permissible concentrations for SO₂, NO₂ and CO 10
Table 9: Applicable Laws and Regulations in Iraq 12
Table 5: Applicable World Bank Operational Policy 13
Table 0.6: EEPP Construction – Noise Emission Sources 17
Table 7: Summary of Impact Assessment Matrix – During Construction / Rehabilitation 24
Table 8: Mitigation Measures for Al- Dhuluiya Rehabilitation Phase 28
Table 9: Mitigation Measures for Al- Dhuluiya Operation Phase. 35
Table 10: Monitoring Activities for Al- Dhuluiya Rehabilitation Phase..... 36
Table 11: Capacity Development Requirements for RBD 40

1. INTRODUCTION

According to the ESMF which has been prepared for the EODP, simplified Environmental and Social Impact Assessment (ESIA) should be prepared, cleared and publically consulted upon prior to the commencement of any construction activities for the roads and bridges component.

The concept of the Environmental and Social Impact Assessment is to propose measures to protect the environmental, social and socio-economic situation of the communities that may be adversely affected by development of the project, and to assist the competent authorities in taking decisions regarding the approval conditions for the project. This ESIA was developed to cover the activities associated with the rehabilitation and operation of **AL-Dhuluiya small and big bridges**. The ESIA identifies key environmental and social impacts of the project activities during both the rehabilitation and the operational phases, and defines the necessary mitigation measures addressing potential negative impacts, as well as monitoring procedures during construction and operation. The ESIA study was carried out according to requirements of the current environmental regulations of the World Bank (OP 4.01), and Iraqi regulations. In this report the WB, and Iraqi environmental and social standards and regulations were followed to ensure the national and international acceptance and compliances of the ESIA. An Environmental and Social Management Plan (ESMP) is prepared and embedded in this ESIA which should be followed and implemented by all relevant parties.

1.1 Objectives

The objectives of this site specific ESIA are to provide:

- Practical and achievable actions to ensure that the project's adverse environmental and social impacts are properly mitigated.
- An integrated plan for monitoring, assessing and controlling potential impacts.
- Support to Local and State authorities to enable setting approval conditions for the project based on relevant standards and procedures.
- Focus on positive aspects and benefits, mitigate negative impacts and avoid serious and irreversible damage to the environment and people
- An opportunity for holding consultation with the communities to get their input on the project activities.
- Information to the local community about the revised project activities and the environmental measures, socio-economic measures, information on residents' rights who might be negatively affected by some project activities and bridge operations,
- Information to the local community of the existence of a grievance **redresses** management (GRM) system through which they might lodge complaints and expect prompt and fair consideration.

This ESIA establishes a framework for the identification of environmental and social protection, mitigation, monitoring measures to be taken during rehabilitation and operational phases of the project. The ESIA includes project description, mitigation measures, monitoring plan, management plans schedule, institutional arrangements, and public consultation. The ESIA will aim to achieve a

good environmental and social performance during construction and maintenance. To meet this goal, the following activities, measures and programs must be followed:

- Environmental regulations
- Application of all environmental and social mitigation and management measures.
- Environmental and social monitoring plan.
- Emergency and contingency plan.
- Institutional plan.
- Environmental and safety measures.
- Effective and open consultations with local communities.

Environmental and social monitoring is an important component of the ESIA. It provides the information for periodic review and refinement modification of the ESIA as necessary, ensuring that environmental and social protection is optimized in all project phases through monitoring and early detection and effective remediation of unwanted environmental and social impacts. Lastly, it will also demonstrate compliance with national and international regulatory requirements.

2. PROJECT DESCRIPTION

2.1 Introduction

In district of Al -Dhuluiya in Salah Ad- Din Governorate. Connect district AL-Duluiya with Balad City, Improving the governorate status going on with the quality development human and commercial activities, Improve navigation on water way. The main aims of the project is the Reconstruction of Al-Dhuluiya Big and Small Bridges and Approaches in Salah- Ad- Din Governorate to facilitate travel and commerce and access to essential service including health care and education and movement of agricultural products. At this time there are two steel panel bridges had been installed on damaged spans of Al-Dhuluiya big and small bridges which had been installed by Iraqi military engineering to operate the bridges for temporary situation and it will be transferred to the RBD when the reconstruction starts for the two bridges, so Al-Dhuluiya main road can be used as an alternative route with length of 8 Km passing through Al-Duluiya floating bridge.

Beneath the bridge there is water canal, this canal is used by the locals for different purposes at least from the population adjacent to the canal bank. The current status of the bridges is totally damaged and it cannot be used as a passage. The adjacent area to the bridge can be used for erection of the contractor camp and facilities, all the area adjacent to the bridge are state owned land. The proposed contractor camp area will be erected in the area owned by the government and not interfere with any private property.

2.2 Project Location

The project is located in the district of Al -Dhuluiya in Salah Ad- Din Governorate.

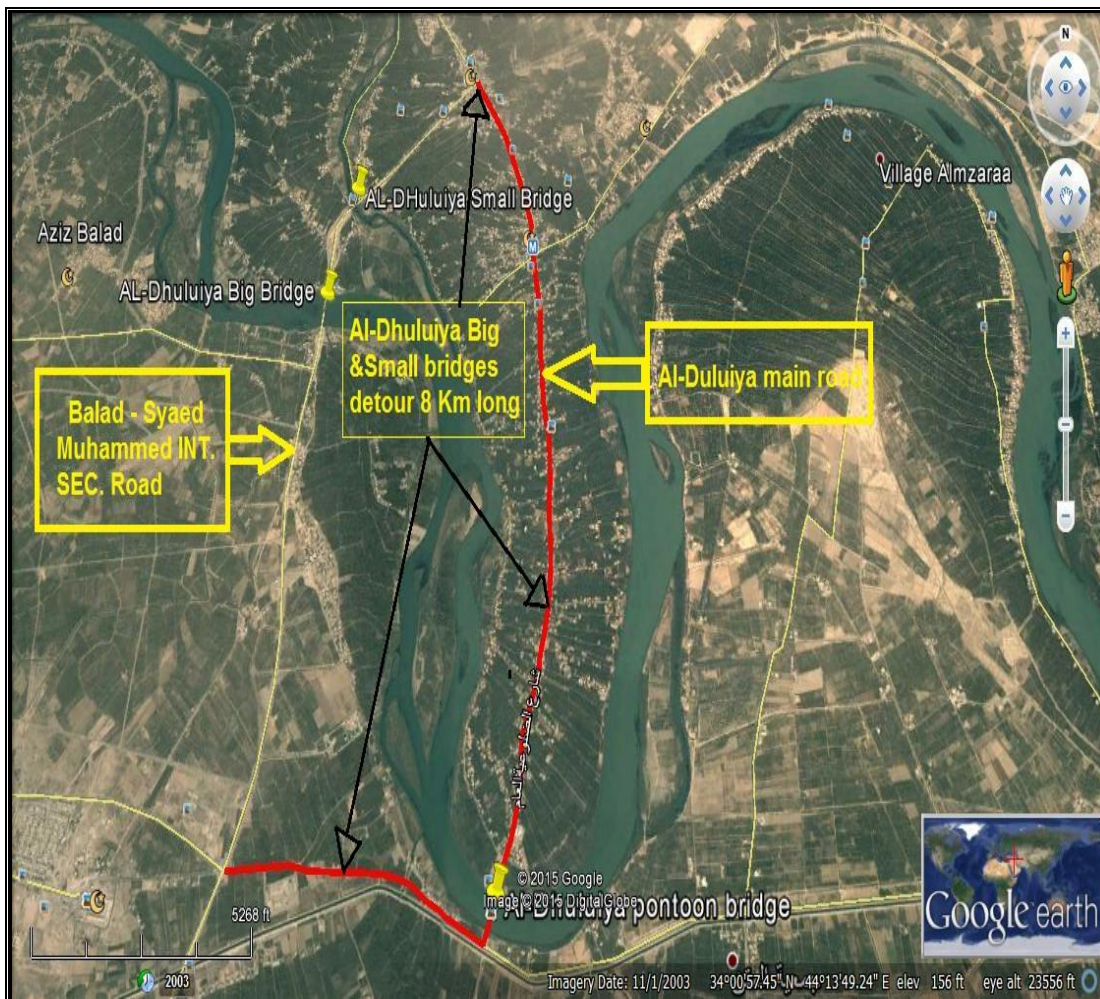


Figure 3: aerial photo of Al-Dhuluiya big and small bridges location

2.3 Approaches description:

The segment of road between the two bridges with length of 600 m starting from Al-Dhuluiya big bridge to Al-Dhuluiya small bridge direction, constructed as a two – lane single carriageway with two direction traffic, total road plenum width is 13.10 m, consist of 7.10m carriageway and 3m shoulder on each side, the shoulder stabilized with asphalt base course, this segment of road connected with four ramps 100 m long, so the entire segment that are needed to be rehabilitated is (1km).



Figure 4: aerial photo of Al-Dhuluiya small bridge



Figure 5: aerial photo of Al-Dhuluiya big bridge

2.5 Services lines

There are two types of service lines (electrical & telecom) cables passing through Al-dhuluiya big and small bridges, (the electric cables passing through the big bridge and the other line passing through the two bridges) which are faced damaged from the Terrorism and it must repair from the contractor according to the item description of service line which mentioned in bill of quantities and with coordination with relevant departments in the governorate.

2.6 Anticipated construction activities, equipment and facilities

2.6.1 Construction activities

- Removal of the destroyed span, (sinking partially) in the river. & as monitored by the RE.
- Demolition of the destroyed span and removal of all the material (gravel steel bars) to the dumping area assigned by the municipality for Al-Dhuleya and approved by the RE.
- Removal of the all the six rubber pads, from site, whenever it is, then transfer, dump it in approved disposal sites;
- Grinding of the asphalt surface layer for the cracked portion of the two ramps, and any other place on the deck slap of the bridge, & transfer (the rubble, gravel, Sand. Remaining of the asphalt) in approved disposal sites.
- Installing the new steel girders as a substitute for the destroyed original concert span, welding and painting each member.
- Arranging to cast reinforced concrete with not less than 30 cm on the steel girders.
- Arranging for the final pavement for the new deck slab & also sealing the other damaged portion of the bridge.

2.6.2 Construction equipment

The following is a description of the types and numbers of construction equipment which are expected to be used in execution on both sites and the estimated number of days which they will operate.

#	Type of Equipment	Quantity (for 2 sites)	Operation Period (per site)
1	30 – ton crane	2	30days
2	Compressor (diesel) 370 Airman	2	30 days
3	Jack – hammer (low noise)	2	7 days
4	Shovel (kawsaki 70) or equivalent	2	6 months
5	Typical lorry with tipping, skipping Body to load of transport the demolished material	4	2 days
6	Truck mixer	4	3 days

7	Asphalt grinder	1	4 days
8	Bitumas tanker	1	4 days
9	Asphalt finisher	1	8 days
10	Compactor (steel & rubber tube)	2	8 days
11	Welding machine (set)	2	4 months
12	Diesel generator 30 K.V.A	2	12 months
13	Grader (komatsu)	1	11 months
14	Pickups & sedan cars	2	12 months
15	Air shot, bell, bugger	2	12 months

As shown above, the duration of construction will last for 12 months as planned.

2.6.3 Construction site facilities

Each construction site, offices for the site engineers (RE and Environmental Manager) equipped with air conditioning and toilet facilities will be on site. In addition rest areas and restrooms for the construction workers will be available.

Potable water tanks will be provided and septic tanks will be constructed for disposal of human sewage.

3. BASELINE CONDITIONS

3.1 The Project Area

Tikrit city and its suburban area have a long historic background of several years as part of the Mesopotamia civilization. The principle agricultural activity in the area is different crops. Farming, some industrial activities are the major economic activity in Tikrit. Tikrit is a major core city and has satellite towns and villages located within the administrative border line. On the left bank of the bridge there are open areas. On the right bank, houses are located far from the project location. There are few houses in the area surrounding the bridge and on the distance more than 400 m of the project location. The project area is almost an open area with some farms located far from the project, with the major palm tree implantation.

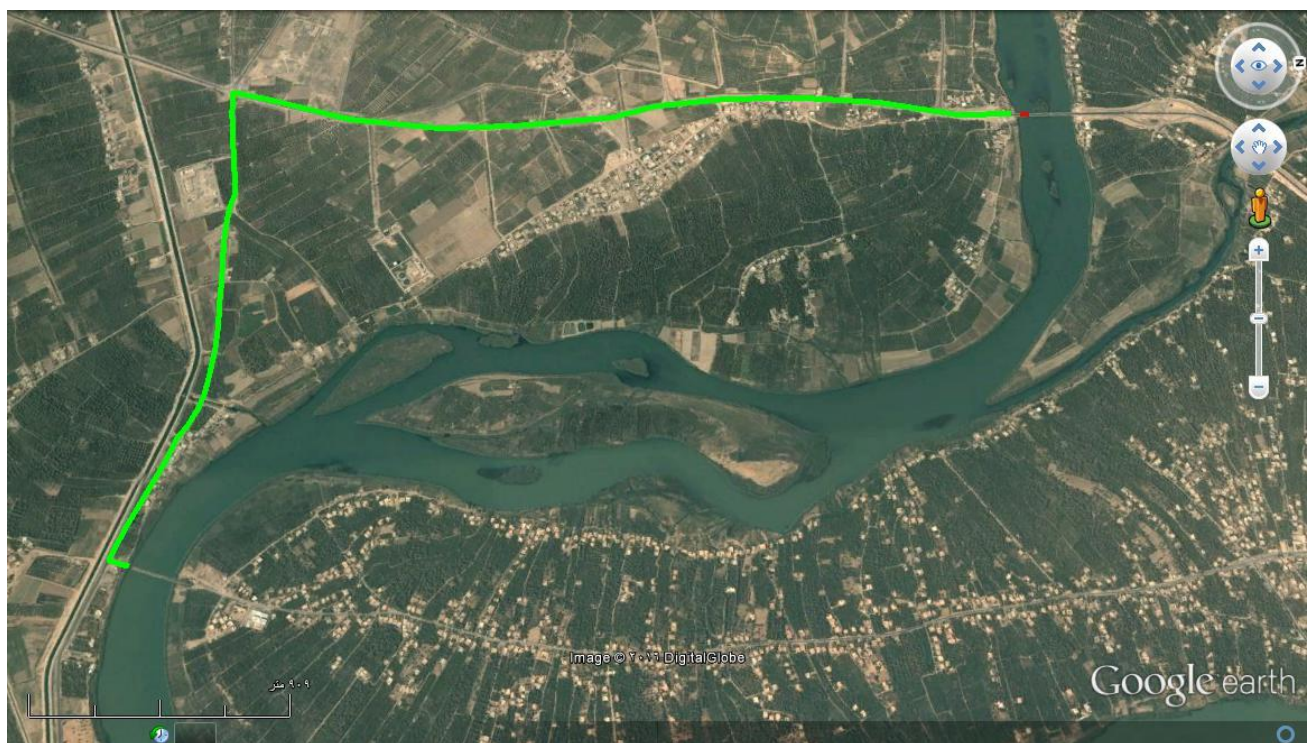


Figure 6: Aerial google map showing the surrounding environmental and social setup

3.2 Environmental and Social Baseline conditions

The environmental baseline section is presented to give clear overview of the environmental and social conditions in the vicinity of the project location prior to commencement of works. The elements of the environment include: climate and meteorology, air quality, surface and groundwater quality, river sediment and soil, topography, noise and vibration levels, traffic, rivers and waterways, biodiversity including flora, fauna, rare or endangered species, and sensitive habitats. It also includes consideration of socio-economic characteristics (such as population, land-use, planned development activities,

community structure, employment, distribution of income, goods and services, recreation, cultural properties, customs, and attitudes. The following sections present such information.

3.2.1 Climate

Salah Ad-Din governorate is located in the northern mid-west part of Iraq, and has a diverse climate. The major rain fall during November, December, January, February, with a spread showering in March. Highest temperatures in July and August reach over 48 degrees centigrade. Rainfall is normally recorded during the months of December to January.

3.2.2 Rainfall, wind velocity and temperature

According to the Iraqi national meteorological commission, the average seasonal annual rainfall is less than 85mm. According to the (environmental survey statistics/ Ministry of planning 2012) records, in 2012 the annual precipitation in Salah Ad-Din governorate was 67mm. Monthly wind velocity record in recent years is shown in the following table.

Table 6: Monthly Mean Wind Speed
Observation station: Salah Ad-Din station Monthly mean wind velocity (m/Sec)

YEAR	JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
2004	1.8	1.3	2.4	1.7	2.2	3.2	3.2	2.5	3.2	1.9	4.8	2.9
2005	1.6	4.5	2.6	2.2	3.1	3.3	2.9	22	2.1	2.8	2.6	2.9
2006	1.4	2.4	3.7	1.9	2.7	23	2.5	2.6	3.1	2.8	1.9	32.0
2007	2.1	2.1	3.2	2.9	2.9	2.9	2.7	3.0	2.2	1.9	2.3	2.3
2008	2.1	2.0	2.8	2.3	2.9	3.3	2.2	3.2	2.1	1.6	2.8	3.0
2009	2.1	2.1	2.8	3.8	3.6	3.3	3.2	3.2	3.0	1.9	2.2	2.4
2010	1.7	1.7	3.0	3.2	3.1	3.4	3.7	3.2	1.7	2.1	2.3	2.6
2011	1.8	2.1	2.6	3.3	2.9	2.8	4.1	2.0	2.1	2.8		
2012	3.2	1.6	4.2	4.2	4.1	3.2	4.2	3.1	3.3	3.2		

The Recent years observation records of air temperature are shown in the following tables.

Table 7: Monthly Mean Temperature
Observation station: Salah Ad-Din station monthly means Max. Temperature (oC)

YEAR	JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.
2007	12.9	13.4	20.1	30.1	32.4	40.1	41.7	42.1	40.1	32.3	26.2	19.4
2008	13.2	14.1	22.1	30.0	32.2	40.9	42.1	42.6	41.1	33.1	25.7	20.3
2009	13.8	14.2	23.1	30.1	33.2	40.8	41.2	42.3	41.2	32.3	25.8	17.5
2010	14.1	16.1	22.2	31.1	32.1	41.6	41.0	42.6	40.0	32.1	24.4	15.6
2011	12.7	13.5	22.6	30.1	41.0	40.4	41.0	43.1	40.0	32.1	24.3	20.3
2012	13.3	13.4	23.1	30.0	40.0	41.4	42.1	45.2	41.3	33.0	23.2	19.3

3.2.3 Air Quality

The nearest air quality monitoring station is located in Kirkuk about 130 kilometers away from the project sits. No real time data are available for this site due to security conditions which precludes having information. However since Al- Duhulyia Bridge is located in an open area with good dispersion of any air pollutants or particulate matters, the concentration of these pollutants is expected to be low.

Table 8: Maximum permissible concentrations for SO₂, NO₂ and CO

	Time	SO ₂ [ppm]	NO ₂ [ppm]	CO[ppm]
World Bank	24 h	125 (µg/m ³)	-	-
Iraq	8:00:00 AM	0.0023	0.011	0.548
	12:00:00 AM	0.0036	0.038	1.211

3.2.4 Site Topography

The project sites area represents an extension of the flat areas that starting from the middle of Iraq till the mid-southern parts of the country. No natural land obstacles are presented in the project area. The area is free of mountains, cliffs, and valleys.

3.2.5 Land use

The land use of area surrounding the project is mostly in use as for agricultural purposes, although, a number of a scattered houses were noticed within a distance less or equal to 400m from the project.

3.2.6 Seismic Activities

No Seismic activities had been recorded for more than 40 years.

3.2.7 Floods

In the some spring season the canal beneath the bridge will work as a drain channel (with a low water flow). In general, there are no hazards of flooding which were recorded previously or expected in the future.

3.2.8 Traffic Level

The traffic level is currently moderate where many vehicles use the temporary bridge facility to connect from/to Al-Dhuluiya city. Due to the nature of the existing temporary installation, the traffic moves slowly especially before crossing over the bridge.

3.2.9 Noise

Except for the existing normal traffic, no other sources of noise are in the area. At night, no traffic exists after darkness.

3.2.10 Heritage Environment

The rehabilitation of the bridge does not pass through any historical, cultural sites. There are no sites of historical or cultural importance in the area, and therefore the rehabilitation and operation of the plant will have no impact on archaeology or cultural heritage. No cemeteries, historical-cultural monuments, churches, mosques near the project need to be removed in order to rehabilitate the bridge.

3.2.11 Land Acquisition

In this project, as the bridge was already existing (not a new constructional activities), no additional land needed to be purchased, to allow rehabilitation works. There are no livelihoods in the project vicinity that are likely to be adversely affected by the project, hence neither involuntary nor voluntarily relocation of people is necessary or expected. Therefore OP 4.12 in this specific project does not apply

3.2.12 Social Aspects

There are no villages, residential complexes or community structures in close proximity to the bridge. The bridge is being constructed on state land, and no land or property expropriation is necessary. No roadside vendors, either licensed or non-licensed were found. The approaches areas on either side of the bridge are not settled on or utilized by any of the local population. All the areas around and within the site remain clear of any settlement or economic use and are ready for rehabilitation works, no interference were registered from the local community which is eager for the works to be completed. No agriculture activities of any kind were initiated the project area, and no buildings, shops, houses etc. were constructed or part-constructed within the project area. One of the major necessities of the locals in the area is to have a good accessible bridge. During implementation stage, traffic will use the Al-Dhuluiya main road as an alternative route which is about 8km passing through Al-Dhuluiya floating bridge.

4. LEGAL REQUIRMENTS

4.1 Iraqi environmental legislations

The work during rehabilitation and operation must follow the Iraqi laws and regulations for the environmental standards. These are:

- Laws of the environment protection No.3 issued in 1997 and the published regulations. No environmental regulations for gaseous emissions, noise and other air pollution standards are in force and legally binding. However, limits for water disposal in any surface waters and main sewers are regulated according to the regulations no. (25)/1967 and their update modifications released from the ministry of health and the ministry of the environment.
- Law of heritage and antiques no. (55) Issued in 2002 (this law defines all movable and immovable antiquities, archaeological properties and artifacts in Iraq. It regulates communication channels between the public and the authorities for each type of Contact between the public and the revealed and non-revealed archaeological sites.
- New environmental framework Law No. 27 of 2009 for the Iraqi national government, have been introduced but the executive decrees remain to be prepared. There are as yet no formally adopted requirements for environmental assessment.
- Regulations governing contact with archaeological sites extend also to encompass developmental activities like road construction and rehabilitation wherever these developmental activities lie within archaeological vicinity.
Regulations of the MOE on sanitary waste must be followed, and for the rubbles (construction &demolition waste) the regulations, legislations and instruction of both MOHE and MOCHPM.

The following Table represents the applicable Iraqi’s laws applicable to such activity.

Table 9: Applicable Laws and Regulations in Iraq

Applicable Iraqi laws
Law no. 37 of 2008 for Ministry of Environment: Describes institutional arrangements of the Ministry of Environment and Outlines policies and roles and responsibilities toward protecting the environment.
Set of instructions issued by the Ministry of Health: Contamination Limits in Pursuance of Law no. 25 of 1967 for Protection of Rivers.
Law no. 27 of 2009 for: Protection and Improvement of Environment
Regulations no. 2 of 2001 for: Preserving water resources.

For legal aspects, the work during rehabilitation and operation must follow the Iraqi laws and regulations for the Environmental Standards. These are laws of the environment protection No.3 issued in 1997 and the published regulations. No environmental regulations for gaseous emissions, noise and other air pollution standards are in force and legally binding. However, limits for water disposal in any surface waters and main sewers are regulated according to the regulations no.

(25)/1967 and their update modifications released from the ministry of health and the ministry of the environment. Law of heritage and antiques no. (55) Issued in 2002, while for a sanitary waste (municipal) the regulations of the MOE must be followed, and for the rubbles (construction & demolition waste) the regulations, legislations and instruction of both MOHE and MOCHPM must be followed.

It should be noted that legislation relating to social safeguards issued in Iraq since 2003 has focused primarily on the ratification of international conventions and protocols on issues such as cultural heritage. As yet there are no formally adopted requirements for social assessments relating to road works. Hence, social safeguards issues remain very largely uncovered except to the extent they are referred to under environmental laws.

4.2 The World Bank Safeguards Policies

In addition to the Iraqi laws and regulation the ESIA follows two key policies and procedures of the World Bank, The following table represents the needed World Bank operational policies which are relevant to the rehabilitation of the bridges.

Table 10: Applicable World Bank Operational Policy

Operational Policies (OP)
OP 4.01 Environmental Assessment
OP 4.12 Involuntary Resettlement
World Bank Group Environmental Health and Safety

1. OP/BP 4.01 - the key Operational Policy describing the environmental assessment procedure. The Bank requires environmental assessment of projects proposed for Bank financing. The objectives of the EA are to:

- a. Ensure that projects proposed for Bank financing are environmentally and socially sound and sustainable.
- b. Inform decision makers of the nature of environmental and social risks.
- c. Increase transparency and participation of stakeholders in the decision-making process.

2. OP/BP4.12 the key Operational Policy describing the involuntary resettlement which focuses on the following principles:

- Involuntary resettlement is avoided wherever feasible, or minimized, exploring all viable alternative project designs;
- Where it is not feasible to avoid involuntary resettlement, activities are conceived and executed as sustainable development programs. Displaced persons are to be meaningfully consulted and have opportunities to participate in the planning and implementing of resettlement programs affecting them; and

- Displaced persons are assisted in their efforts to improve their livelihoods and standards of living, or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. The mechanism of assisting displaced persons is based on full and prior mitigation and compensation for loss of assets or livelihoods.
- OP 4.12 applies whenever, in a Bank-financed project, land is acquired involuntarily or access is restricted in legally designated parks or protected areas.

3. World Bank Group Environmental Health and Safety (EHS)

The Iraqi requirements on EHS are quite stringent and match, to a large extent, the international best practices on EHS. The World Bank Group Environmental, Health, and Safety (EHS) Guidelines: GENERAL EHS GUIDELINES: CONSTRUCTION AND DECOMMISSIONING, provides specific guidance on EHS requirements for construction related activities (Chapter 4). This includes EHS aspects related to:

- Environment
- Noise and Vibration
- Soil Erosion
- Air Quality
- Solid Waste
- Hazardous Materials
- Wastewater Discharges
- Contaminated Land
- 4. Occupational Health and Safety
- 5. Community Health and Safety
- General Site Hazards
- Disease Prevention
- Traffic Safety

Grievance Redress Mechanism

Bank procedures require that Grievance Redress Mechanisms (GRMs) be established and operational prior to commencement of the project, and that they continue to operate for one year following completion of the works. A checklist of issues to be considered in the design of the GRMs includes the following:

- An inventory of any reliable conflict mediation organizations or procedures in the project area is undertaken and an assessment made to determine if any of these entities or procedures might be used, ensuring that complaints were received and addressed in an effective, timely and transparent manner.
- Good practice is to ensure that PAPs can apply verbally and in the local language and to insist on explicit time limits for responding to grievances received. Appeal procedures need to be specified, and this information is made publicly available therefore, allow for both verbal and written grievances to be lodged with the local project authorities, who will transmit these to the local level committee for review, consideration and response.

5. IMPACT ASSESSMENT AND MITIGATION MEASURES

5.1 Construction/Rehabilitation Phase

This section of the report describes the environmental and social impacts that are likely to result from the construction and rehabilitation of the big and small bridges, and the mitigation measures addressing them.

The Environmental actions, procedures and responsibilities as required during the construction phase must comply with the available specifications, legislation, laws issued by the MOHE.

The construction contractor(s) will be responsible for compliance with the ESIA provisions during the rehabilitation phase of the project. The contractor will be also in charge of undertaking work in a manner which complies with all relevant environmental procedures, adheres to all legislative requirements, and ensures that all environmental objectives associated with the contract are achieved. The key environmental and social impacts are described below.

5.1.1 Impacts on Air Quality

The main impacts on air quality will result from the emissions of the construction equipment and trucks used to transport construction materials. In addition, dust will be generated from the movement of vehicles and equipment on unpaved roads as well as the demolition and removal of concrete blocks.

Although the surroundings of the small bridge are characterized by having agricultural lands and few scattered houses, the impacts on air quality will be temporary (only for few days during the rehabilitation period which is around 1 year) and will be reversed once the rehabilitation works are completed. The dust and particulate matters (could arise from accumulated piles of stored inert waste material at or near the site prior to removal for disposal, stockpiles of ground asphalt, rubble, gravel, and sand) that may result from these activities will be identified and assessed and the needed mitigations measure will be identified and implemented by the contractor. Nearest sensitive receptors will also be identified with regards to potential impacts from particulate matter/dust.

Therefore, the impacts on air quality are assessed to be of **low significance**.

5.1.1.1 Mitigation measures

Mitigation measures should include, but not limited to, the following practices and actions:

- Engines of vehicles and other machinery are kept turned on only if necessary, avoiding any unnecessary emission;
- Machines and equipment are periodically checked and maintained to ensure their good working condition;
- All equipment and machines must be maintained and tested for compliance with standards and technical regulations for the protection of the environment and have appropriate certifications;
- Activities are carried out using the minimum required number of means at the same time; and

- Electric small-scale mechanization and technical tools are used when available and feasible;

Concerning dust control methods and measures, the following actions are to be taken into account to reduce the generation of dust:

- Unpaved roads, e.g. detours to access the construction site, which may be utilized for construction vehicles movement or transportation of construction materials should be prepared in a way to avoid dust emissions. A sub base layer of 15 cm and wet compaction should take place to get sufficient compaction to avoid dust emissions.
- The detour(s) should always be maintained in good conditions.
- Watering or increase of the moisture level of the open materials storage piles to reduce dust levels;
- enclosure or covering of inactive piles to reduce wind erosion;
- loads in all trucks transporting dust-generating materials have to be sprayed with water to suppress dust, as well as wheels of means moving inside and outside of the construction-site; and
- speed reduction for vehicles approaching the site to less than 40 km/hr. On site, speed should not exceed 20 km/ht.

5.1.2 Noise impacts

Currently the only source of noise is the road traffic. Once the rehabilitation works start, the construction workers will be exposed to high levels of noise. Since the noise levels which will be generated from construction equipment may exceed the permissible levels (80 dB), workers should be provided by necessary personal protection equipment (ear muffs) to minimize impacts of exposure to high noise levels.

The nearest residential community will not be negatively affected by the noise levels generated from the construction site and noise levels are expected to be decreased to less than 80 dB (national noise level exposure limit).

The following will be expected to be the main sources for noise impacts on the surrounding receptors:

- noise emissions from the equipment engines used during the construction activities (earth works, breaking of damaged blocks, use of jack hammers, cutting of steel,..etc.); and
- Movement of trucks and other equipment from and to the construction site.

5.1.2.1 Sound Pressure Levels from Construction-Site Equipment

Noise impact was evaluated considering the equipment that could operate simultaneously in the construction site. In the following Table equipment typologies and sound power levels Lw (dBA) are reported.

Table 01: EPPP Construction – Noise Emission Sources

Machinery	Lw (dBA)
Excavators	105.9
Truck	105.9
Scrapers and levellers	111

Machinery	Lw (dBA)
Rollers	99.2
Asphalting machines	100
Truck cranes	108.3
Generating sets	97.3
Motor-driven compressors	99.2
Fork lifts	101

The Lw values were determined based on the equipment model based on equipment with similar features and comparable power.

Noise impacts will mainly affect the construction workers and may also affect the nearby houses.

The noise impacts will be temporary, short term and localized therefore it is assessed to be of **low significance**.

5.1.2.1 Mitigation measures

Mitigation measures should include, but not limited to, the following practices and actions:

- Construction activities are to take place within reasonable hours during the day and early evening. Night-time activities near noise sensitive areas, such as residential buildings, should not be allowed.
- Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order.
- Equipment to run only when necessary; and
- Positioning of the noise sources in a concealed area with respect to acoustic receptors, consistent with the needs of the construction site.

5.1.3 Impacts on water resources

The potential impacts on the water environment derived from the EEPP construction activities are presented in this section with particular reference to:

- water consumption;
- water discharge; and
- groundwater.

5.1.3.1 Impacts related to Water Consumption (Construction Phase)

Water consumption during the construction phase is mainly related to:

- human use due to the presence of the staff (the maximum water consumption during this stage is quantified as 60 l/day per worker);
- soil watering for dust suppression during excavation works and construction vehicles transits;
- washing down and cleaning equipment at localized work sites; and

The overall impact related to these levels of consumption is temporary and reversible and is considered negligible because the quantities of water involved are relatively small, and they will be required over a short period of time. The water supply requirements will be provided by trucks through licensed service provider.

5.1.3.2 Impacts related to surface and ground water

The construction sites will be equipped with worker/engineer caravans which will be equipped with lavatory facilities (toilets and sinks). Improper wastewater disposal on soils may percolate to ground water and thus causing contamination of subsurface/ground water table.

If wastewater is collected and discharged into the water stream, it will cause pollution to the river surface water.

Contaminated wastewater by engine oils or lubricant after washing of equipment or by accidental spills may also find its way to the river stream thus polluting its waters and affecting its ecosystem.

If the damaged concrete blocks, currently immersed in the river stream, are broken into small pieces to be able to lift them out of the river, the generated dust will fall into the water stream and will increase the suspended solids which will in turn affect the surface water quality.

In addition, improper disposal of any liquid or solid wastes into the river may pollute its waters or block the water flow.

Although the rehabilitation activities are temporary, the pollution of the river water and underground water is assessed to be of **medium significance**.

5.1.3.3 Mitigation measures

Mitigation measures should include, but not limited to, the following practices and actions:

- Damaged sections of the bridge which are immersed in the river should be carefully removed without polluting the river water.
- In case of big volumes of the damaged sections which need to be broken into smaller size blocks, geotextile meshes or other suitable means should be used to prevent the dispersion of cement dust into the water stream.
- Monitoring of water quality should be done in specific locations upstream and downstream from the location of works to ensure that water quality is not adversely affected.
- Wastewater from the worker rest areas or construction offices should be contained in solid bottom containers and should be removed regularly from site by means of authorized contractors. The wastewater should be disposed in wastewater treatment plants as determined by the municipality.
- In case of using septic tanks on site, the engineering drawings of these tanks should be presented to the Resident Engineer for approval.
- In case of the need to change engine oils or refuel some construction equipment, a proper maintenance workshop or shelter should be installed to ensure containment of any fuel or oil spills.

- No solid wastes are to be thrown into the river.
- Use of paints or chemicals should be done away from the river. However, if non-avoidable, excessive precautions should be undertaken to avoid spillages into the river water.
- Accidents and spill response and cleanup plan linked to water resources must be presented by the contractor and approved by the Resident Engineer prior to any construction activities.
- A comprehensive emergency plan must be submitted by the contractor and approved by the Resident Engineer to include all the needed steps and procedures in order to have a good confinement of any emergency situation related to accidents and spillages.

5.1.4 Impacts on soil

The increasing of soil erosion could be caused by the removal of vegetation and large-scale excavation activities for the construction. Site for the Project has no vegetation; hence impact related to soil erosion owing to removal of vegetation is insignificant.

The construction activities will not cause harmful changes in geomorphologic landforms and site setting.

Improper disposal of solid or liquid wastes may pollute the surrounding soils. Accidental oil and fuel spills may also result in contaminating soils.

Due to the temporary and limited rehabilitation activities, soil contamination impacts are assessed to be of **low significance**.

5.1.4.1 Mitigation measures

Mitigation measures should include, but not limited to, the following practices and actions:

- No hazardous waste storage to take place directly on soils. Appropriate and enclosed containers should be utilized.
- To prevent soil contamination by oil/grease spills, leakages or releases, all manipulations of oil derivatives in the process of construction and provision of the fuel to the machines should be performed with maximum care; leak proof containers should be used for storage and transportation of oil/grease and wash off from the oil/grease handling area shall be drained through drains and treated appropriately before disposal;
- Construction waste and debris shall be collected on a regular basis and disposed of at designated landfills;
- Only authorized quarries shall be used for purchasing soil to be used for embankment, padding, bedding, backfilling during construction; and
- It must be prohibited to operate equipment and vehicles outside the designated work areas and roads.
- Accidents and spill response and cleanup plan must be presented by the contractor and approved by the Resident Engineer as a mitigation for impacts related to the soil.

5.1.5 Solid and hazardous wastes

The present section discusses the potential environmental and social impacts of waste associated with the Project construction phase throughout the following stages of the waste management process:

- temporary storage on the site area; and management and disposal of wastes.

The construction phase will be carried out through different activities as civil, mechanical, piping electrical, etc. which in turn will generate volumes of waste with typology characteristic of the nature of each activity.

In general, waste generated during construction phase shall be divided into:

- construction waste;
- municipal solid waste; and
- other waste related to the maintenance activities of machines..

Solid construction waste typically includes concrete, asphalt, wood, plastic, glass, metals and other composite materials.

Hazardous waste potentially generated during construction activities includes empty paints/chemical containers, equipment batteries, and trash such as oil contaminated material, and similar. Removed asphalt will also be considered as hazardous wastes.

The quantities of solid and hazardous wastes are expected to be moderate but due to the weaknesses in the capacity of the local authorities in managing solid and hazardous wastes and lack of waste management facilities, the impacts of solid and hazardous wastes are assessed to be of **medium significance**.

5.1.5.1 Mitigation measures

- Minimize waste generation on site.
- Simple waste management plan for specific waste streams must be developed.
- General waste must be collected and transported to the local municipality approved disposal sites.
- Food wastes must be collected, where practicable, considering health and hygiene issues, for disposal off-site through licensed contractors.
- Waste containers must be located at each worksite.
- Chemical wastes must be collected in 200 liter drums (or similar sealed container), appropriately labeled, for safe transport to an approved chemical waste depot or collection by a liquid waste treatment service.
- Storage, transport and handling of all chemicals must be conducted in accordance with all legislative requirements, through licensed contractors and in coordination with the local authority.
- All hazardous wastes must be appropriately stored in bounded areas and should be clearly identified as “hazardous”.

- Transportation and disposal of hazardous wastes should be done through licensed contractors and in close coordination with the relevant local authority and in compliance with the legal requirements and instructions of the coordination with the as ministry of science and technology.
- Hazardous liquids, such as solvents, rust proofing agents and primer must be managed in accordance with the requirements of relevant legislation and industry standards.
- A hazardous materials inventory for the construction period must be prepared.
- Material Safety Data Sheets (MSDS) for hazardous materials must be available on-site during construction and made available and explained to workers.
- Hydrocarbon wastes, including lube oils, must be collected for safe transport off-site for reuse, recycling, transport or disposal at approved locations.
- Accidents due to the hazardous waste generation and cleanup plan must be presented by the contractor and approved by the Resident Engineer prior to construction activities.

5.1.6 Flora & Fauna

Except for agricultural crops, fruit trees and farmland animals, there is no observed wild life or significant naturally grown plants or flora species due to the human activities and presence in the area.

No rare or endangered species were identified within or nearby the project site.

5.1.7 Topography and landforms

The local topography will not be altered by the project activities.

5.1.8 Impacts on local traffic

The rehabilitation of the bridge will require the blockage of the traffic over this bridge. This will result in increasing traffic levels in other locations which will be used as alternative routes. Therefore, it is expected that air pollution and noise levels will increase in the alternative routes. In addition, an increase in the travel time due to the traffic diversion may occur which may result in increased transportation costs of goods and passengers. In addition, disturbance and inconvenience to the local population may result due to the route diversion.

The route diversion will be temporary until the rehabilitation activities are completed. Also the alternative route which is selected to be an alternative for this bridge is not far from the existing bridge, furthermore, the suggestive route diversion will not be close to any farmlands, or passing through any private territories, therefore the overall impacts of the rehabilitation activities on the local traffic is expected to be of **low significance**.

5.1.8.1 Mitigation measures

Since it is unavoidable to prevent vehicles from using bridge which will be rehabilitated, the following measures can be taken to minimize the negative impacts of the route diversion:

- Provide information, through appropriate signage, to the bridge users to use the alternative route;
- Upgrade the alternative route to be able to receive the additional number of vehicles.

In order to minimize air and noise impacts associated with traffic generated by the project's traffic, the following measures must be implemented:

- Where practicable, truck deliveries must be restricted to daytime working hours.
- Dangerous goods must be transported along routes preferred for dangerous goods,
- Clear traffic signs and signs signals must be installed on-site to provide for safe traffic.

5.1.9 Health and Safety

During the rehabilitation phase of the project, there are risks posed to human health by accidents resulting from the use of heavy construction equipment. Road accidents especially near the farmlands may occur.

As far as the emission of pollutants is concerned, it should be noted that the impact on the air due to the activities to be performed, was found to be low.

It should be noted that in order to evaluate the acceptability of the impact of the emissions into the air on public health, the concentrations of the various different pollutants in the air have to be compared in the first place with the regulation limits. In this respect, no limits overcoming has occurred. Similarly, the considerations for noise lead to the expectation that the impact will be low.

With regard to exposure of the workers to dust and pollutant emission during construction and noise during both construction, all the necessary technical arrangements shall be made to protect their health, in accordance with the most recent indications and requirements of the appropriate regulations.

5.1.9.1 Mitigation measures

In order to minimize these risks:

- Limit speed of construction vehicles and provide road signage for drivers and local community.
- Qualified personnel must be employed for the construction equipment, and personnel must be trained for health and safety issues.
- Personal protection equipment such as eyeglasses, gloves, hard heads and safety belts must be supplied and continuously used all workers, technicians, engineers and site visitors.
- compliance with international standards for good construction practices;
- adherence to local and international guidance and codes of practice on Environmental Health and Safety (EHS) management during construction;
- management, supervision, monitoring and record-keeping;
- implementation of EHS procedures as a condition of contract with contractors and their sub-contractors;

- clear definition of the EHS roles and responsibilities of the companies involved in construction and to individual staff (including the nomination of EHS supervisors during construction and an EHS coordinator during operation);
- pre-construction assessment of the EHS risks and hazards associated with construction and operation, including consideration of local cultural attitudes, education level of workforce and local work practices;
- provision of appropriate training on EHS issues for all construction and operation workers, including initial induction and regular refresher training, taking into account local cultural issues;
- provision of health and safety information;
- regular inspection, review and recording of EHS performance; and
- maintenance of a high standard of housekeeping at all times.

An emergency plan must be prepared in order to cover all the possible risks that may result from different civil work activities. Such plan must deal with the following items:

- Any accidents to be reported and treated within site as a first aid procedure.
- Safety training for the workers (slips and falls, work in heights, struck by objects, moving machinery, confined spaces...etc)
- Fuel and oil changing shelters should be equipped with necessary firefighting and safety equipment.

A detailed emergency plan shall be prepared by the contractor and submitted to the Resident Engineer for approval prior to construction activities.

5.1.10 Socio – Economic Impacts

It is expected that the Local community members overwhelmingly support the bridge rehabilitation because of its potentially very significant contribution to local transportation, marketing of local produce, and stimulation of local business opportunities from new passing traffic. During the rehabilitation phase, the Project will generate additional new employment opportunities for local community residents. These will be for both skilled and unskilled workers. It is agreed that, for both work categories, first preference will be given to local residents. However in case of any negative aspects which may have not been identified at this stage, the local community will be able to communicate their complaints through a Grievance Redress Mechanism (GRM) which will be developed by the project and will be easily accessible (see Annex 2).

5.1.11 Land Acquisition

It is not anticipated that any involuntary land acquisition will be required. No additional or extra land will be needed to be rent or owned by the contractor for any purpose as there is a sufficient land area (owned by the government) surrounding the project that can be used by the contractor for any reason. Detours and construction site offices will be placed in the buffer zone of the roads approaching the bridge and free from any beneficiaries and not currently occupied or utilized. Therefore OP 4.12 in this specific project does not apply.

Table 2: Summary of Impact Assessment Matrix – During Construction / Rehabilitation

	Environmental Receptor	Impact Significance
1	Air Quality	Low
2	Noise	Low
3	Water Resources	Medium
4	Soil	Low
5	Solid and hazardous wastes	Medium
6	Flora & Fauna	In significant
7	Topography and landforms	In significant
8	Impacts on local traffic	Medium
9	Health and Safety	High
10	Socio-Economic impacts	Medium

5.2 Operational Phase

5.2.1 Air Quality

The operation of the bridge after rehabilitation will increase the traffic volume which in turn will increase air emissions from vehicles.

- During the license issuance or renewal process of vehicles, traffic authorities should ensure that all vehicle engines are in good conditions.

5.2.2 Noise

The operation of the bridge after rehabilitation will increase the traffic volume which in turn will increase noise levels from vehicles.

- During the license issuance or renewal process of vehicles, traffic authorities should ensure that all vehicle engines are in good conditions.
- Speed limits should be reduced especially near residential buildings.
- Limit trucks movement especially at night in coordination with the local traffic authorities.

5.2.3 Water resources

No impacts are expected on the fresh water resources during operation.

5.2.4 Soil

No impacts are expected on soil during operation.

5.2.5 Solid and hazardous wastes

During the operational period, some littering and waste generation resulting from the repair activities will occur. Littering may occur due to wind action. All the above solid waste must be collected and disposed by the municipality trucks and vehicles.

5.2.6 Flora & Fauna

No impacts are expected on flora or fauna during operation.

5.2.7 Topography and landforms

The local topography will not be altered by the project activities.

5.2.8 Impacts on local traffic

It is expected that the local traffic conditions will significantly improve due to the operation of the bridge.

5.2.9 Health and Safety

Road accidents may result due to the operation of the bridge and increased traffic volume.

- Speed limits and road signs should be in place to prevent or minimize the road accidents.
- The bridge must be provided with suitable post lighting at night to reduce the probability of road accidents.

5.2.10 Socio-Economic impacts

During the operational period, the project is expected to result in positive socio-economic outcomes for the local communities. Socially harmful consequences of bridge operation are not anticipated. However, the continued operation of a GRM for one year following opening of the bridge for use will ensure that local community members have an accessible, fair and transparent means of reporting any emerging adverse impacts, and a means of obtaining mitigation.

6. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

6.1 Mitigation measures, responsibilities and estimated associated costs

In this section, the identified mitigation measures will be summarized. The responsibility for implementation of the mitigation measures will be mostly upon the contractor. However, the supervision and assurance that the mitigation measures are implemented will be the responsibility of the Resident Engineer who represents the RBD as the Project Owner.

The Resident Engineer will be assisted by a team of environmental and social officers who will be responsible for supervising the daily activities of the contractor and will report non-compliances to the Resident Engineer in order to take necessary actions towards the contractor. Regular supervision site visits will also be conducted by the RBD PMT environmental/social officer in association with a qualified environmental and social consultant who will provide technical advice in case there is a need to modify or add new mitigation measures as work necessitates.

The costs of mitigation measures are estimated based on the average market rates for similar activities in Iraq and can be used as indicative costs. It is the sole responsibility of the contractor to estimate the costs associated with the recommended mitigation measures based on his work experience.

The following tables summarize the mitigation measures which are required to be undertaken to avoid any negative impacts on the environment. Responsibilities and estimated costs are also presented.

Table 3: Mitigation Measures for Al- Dhuluiya Rehabilitation Phase.

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
1	Air quality	<ul style="list-style-type: none"> - Unpaved roads, e.g. which may be utilized for construction vehicles movement or transportation of construction materials should be prepared in a way to avoid dust emissions. A sub base layer of 15 cm and wet compaction should take place to get sufficient compaction to avoid dust emissions. The detour should always be maintained in good conditions. - The detour(s) should always be maintained in good conditions. - Watering or increase of the moisture level of the open materials storage piles to reduce dust levels; - enclosure or covering of inactive piles to reduce wind erosion; - loads in all trucks transporting dust-generating materials have to be sprayed with water to suppress dust, as well as wheels of means moving inside and outside of the construction-site; and - speed reduction for vehicles approaching the site to less than 40 km/hr. On site, speed should not exceed 20 km/ht. 	Contractor	Resident engineer	3000
		<ul style="list-style-type: none"> - Engines of vehicles and other machinery are kept turned on only if necessary, avoiding any unnecessary emission; - Machines and equipment are periodically checked and maintained to ensure their good working condition; - All equipment and machines must be maintained and tested for compliance with standards and technical regulations for the protection of the environment and have appropriate certifications; - Activities are carried out using the minimum required number of means at the same time; and 	Contractor	Resident engineer	Included in contractor cost

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		- Electric small-scale mechanization and technical tools are used when available and feasible;			
		Limit vehicle speed limits to be the minimum (less than 40 km/hour) near residential buildings and farmlands.	Contractor	Resident engineer	Included in contractor cost
2	Noise	Construction activities are to take place within reasonable hours during the day and early evening. Night-time activities near noise sensitive areas, such as residential buildings, should not be allowed.	Contractor	Resident engineer	Included in contractor cost
		- Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order. - Equipment to run only when necessary; and - Positioning of the noise sources in a concealed area with respect to acoustic receptors, consistent with the needs of the construction site.	Contractor	Resident engineer	Included in contractor cost
		Use of personal protection equipment for workers especially those who use jack hammers or near noisy engines or compressors.	Contractor	Resident engineer	2000
		Damaged sections of the bridge which are immersed in the river should be carefully removed without polluting the river water.	Contractor	Resident engineer	Included in contractor cost
3	Water resources	Wastewater from the worker rest areas or construction offices should be contained in solid containers and should be removed regularly from site by means of authorized contractors.	Contractor	Resident engineer	8000
		In case of the need to change engine oils or refuel some construction equipment, a proper maintenance workshop or shelter should be installed to ensure containment of any fuel or oil spills.	Contractor	Resident engineer	3000
		- In case of using septic tanks on site, the engineering drawings of these tanks should be presented to the Resident Engineer for approval.	Contractor	Resident engineer	Included in contractor cost

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		<ul style="list-style-type: none"> - No solid wastes are to be thrown into the river. - Use of paints or chemicals should be done away from the river. However, if non-avoidable, excessive precautions should be undertaken to avoid spillages into the river water. 			
4	Soil	<ul style="list-style-type: none"> - To prevent soil contamination by oil/grease spills, leakages or releases, all manipulations of oil derivatives in the process of construction and provision of the fuel to the machines should be performed with maximum care; leak proof containers should be used for storage and transportation of oil/grease and wash off from the oil/grease handling area shall be drained through drains and treated appropriately before disposal; - Construction waste and debris shall be collected on a regular basis and disposed of at designated landfills; - Only authorized quarries shall be used for purchasing soil to be used for embankment, padding, bedding, backfilling during construction; and - It must be prohibited to operate equipment and vehicles outside the designated work areas and roads. 	Contractor	Resident engineer	Included in contractor cost
		<ul style="list-style-type: none"> - No hazardous waste storage to take place directly on soils. Appropriate and enclosed containers should be utilized. 	Contractor	Resident engineer	1000
5	Solid and hazardous wastes	<ul style="list-style-type: none"> - Minimize waste generation on site. - Simple waste management plan for specific waste streams must be developed. - General waste must be collected and transported to local council approved disposal sites. 	Contractor	Resident engineer in coordination with the local authority and ministry of science and technology regarding hazardous wastes	6000

Receptor	Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
	<ul style="list-style-type: none"> - Food wastes must be collected, where practicable, considering health and hygiene issues, for disposal off-site through licensed contractors. - Waste containers must be located at each worksite. - Chemical wastes must be collected in 200 liter drums (or similar sealed container), appropriately labeled, for safe transport to an approved chemical waste depot or collection by a liquid waste treatment service. - Storage, transport and handling of all chemicals must be conducted in accordance with all legislative requirements, through licensed contractors and in coordination with the local authority. - All hazardous wastes must be appropriately stored in bounded areas and should be clearly identified as “hazardous”. - Transportation and disposal of hazardous wastes should be done through licensed contractors and in close coordination with the relevant local authority and in compliance with the legal requirements and instructions of the coordination with the as ministry of science and technology. - Hazardous liquids, such as solvents, rust proofing agents and primer must be managed in accordance with the requirements of relevant legislation and industry standards. - A hazardous materials inventory for the construction period must be prepared. - Material Safety Data Sheets (MSDS) for hazardous materials must be available on-site during construction and made available and explained to workers. - Hydrocarbon wastes, including lube oils, must be collected for safe transport off-site for reuse, recycling, transport or disposal at approved locations. 			

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
6	Flora & Fauna	Not Applicable	Not Applicable	Not Applicable	Not Applicable
7	Topography and landforms	Not Applicable	Not Applicable	Not Applicable	Not Applicable
8	Traffic	<ul style="list-style-type: none"> - Provide information, through appropriate signage, to the bridge users to use the alternative route; - Upgrade the alternative route to be able to receive the additional number of vehicles. - Clear traffic signs and signs signals must be installed on-site to provide for safe traffic - Where practicable, truck deliveries must be restricted to daytime working hours. - Dangerous goods must be transported along routes preferred for dangerous goods, - Clear traffic signs and signs signals must be installed on-site to provide for safe traffic. 	Contractor in coordination with the Local Traffic Department	Resident Engineer	500
9	Health and Safety	- Limit speed of construction vehicles and provide road signage for drivers and local community.	Contractor	Local traffic department in coordination with the Resident engineer	1000
		<ul style="list-style-type: none"> - Qualified personnel must be employed for the construction equipment, and personnel must be trained for health and safety issues. - Personal protection equipment such as eyeglasses, gloves, hard heads and safety belts must be supplied and continuously used by all workers, 	Contractor	Resident engineer	3000

Receptor	Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
	<p>technicians, engineers and site visitors.</p>			
	<ul style="list-style-type: none"> - compliance with international standards for good construction practices; - adherence to local and international guidance and codes of practice on Environmental Health and Safety (EHS) management during construction; - management, supervision, monitoring and record-keeping; - implementation of EHS procedures as a condition of contract with contractors and their sub-contractors; - clear definition of the EHS roles and responsibilities of the companies involved in construction and to individual staff (including the nomination of EHS supervisors during construction and an EHS coordinator during operation); - pre-construction assessment of the EHS risks and hazards associated with construction and operation, including consideration of local cultural attitudes, education level of workforce and local work practices; - provision of appropriate training on EHS issues for all construction and operation workers, including initial induction and regular refresher training, taking into account local cultural issues; - provision of health and safety information; - regular inspection, review and recording of EHS performance; - maintenance of a high standard of housekeeping at all times. 	Contractor	Resident engineer	Included in contractor cost

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		<ul style="list-style-type: none"> - Any accidents to be reported and treated within site as a first aid procedure. - Safety training for the workers. - Fuel and oil changing shelters should be equipped with necessary firefighting and safety equipment - First aid items should be available all times onsite and trained staff on emergency aids should be identified. 	Contractor	Resident engineer in coordination with health and safety officials.	2500
10	Handling Complaints	- A complaints register will be kept on site and this will feed into the GRM. Details of complaints received will be incorporated into the audits as part of the monitoring process.	Resident Engineer	RBD/PMT	Included in contractor cost
Total cost US\$ (rehabilitation phase)					30,000

Table 4: Mitigation Measures for Al- Dhuluiya Operation Phase.

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
1	Air quality	During the license issuance or renewal process of vehicles, traffic authorities should ensure that all vehicle engines are in good conditions.	Traffic Department	Traffic Department	No cost
2	Noise	During the license issuance or renewal process of vehicles, traffic authorities should ensure that all vehicle engines are in good conditions. Speed limits should be reduced especially near residential buildings. Limit trucks movement especially at night in coordination with the local traffic authorities.	Traffic Department	Traffic Department	No cost
3	Water resources	Not applicable	Not applicable	Not applicable	Not applicable
4	Soil	Not applicable	Not applicable	Not applicable	Not applicable
5	Solid and hazardous wastes	During the operational period, some littering and waste generation resulting from the repair activities will occur. Littering may occur due to wind action.	Local Authority (Municipality)	Local Authority (Municipality)	Within municipal budget
6	Traffic	Speed limits and road signs should be in place to prevent or minimize the road accidents.	Traffic Department	Traffic Department	No cost
		The bridge must be provided with suitable post lighting at night to reduce the probability of road accidents.	RBD	RBD	Within RBD budget
7	Flora & Fauna	Not Applicable	Not Applicable	Not Applicable	Not Applicable
8	Topography and landforms	Not Applicable	Not Applicable	Not Applicable	Not Applicable
9	Traffic	Improved traffic conditions	Local Traffic Department	Resident Engineer	No Cost
10	Handling Complain	The continued operation of a GRM for one year following opening of the bridge for use will ensure that local community members have an accessible, fair and transparent means of reporting any emerging adverse impacts, and a means of obtaining mitigation.	RBD/PMT	Local authorities	No cost
Total cost US\$ (Operation phase)					No Cost

7. ENVIRONMENTAL AND SOCIAL MONITORING PLAN

7.1 Environmental and Social Monitoring

In order to ensure full compliance of the performed activities to the environmental and social requirements, regular monitoring should be performed.

In this section, the environmental and social monitoring activities will be presented, the institutional responsibilities will be determined in addition to the necessary resources which need to be in place to perform the monitoring activities. The objectives of the monitoring are as follows:

- To measure the compliance with the ESMP mitigation measures
- To verify the results of the project’s environmental and social impact assessment
- To study the trend of construction values of the parameters, which have been identified as critical.
- To ensure that all safety concepts were implemented properly during the bridge operation.
- To ensure no harm is incurred by local communities from bridge operation, including to land, productive plants, infrastructures, and livelihoods.

To ensure the proper implementation of the environmental and social mitigation measures, an environmental and social monitoring program has been established for the construction phase.

Table 5: Monitoring Activities for Al- Dhuluiya Rehabilitation Phase.

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimate
1	Air quality	Investigate dust complaints from workers and residents Visual inspection of vehicles and equipment operating or entering the site Measurements of exhaust emissions (CO, SO _x , NO _x , PM ₁₀ , PM _{2.5})	Recorded and documented complaints Recorded the status of equipment and vehicles on site (excessive black or white smoke)	Daily visual inspection Monthly measurements	Engineer	PMT	12,000
2	Noise	Investigate noise complaints from workers and neighboring communities in the affected locations Measure ambient noise near sensitive receptors (dBA)	Recorded and documented complaints	Weekly inspection of complaints Monthly noise measurement	Engineer	PMT	6,000
3	Water resources	Investigate implementation of mitigation measures and observe any oil or fuel spills. Investigate wastewater disposal measures Water samples (pH, TDS, TSS, BOD, COD)	Site Investigation report	Daily Investigations Monthly Measurements	Engineer	PMT	12,000

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimate
4	Soil	Observe any soil contamination with oil or fuel Observe any accumulation of wastes	Site Investigation report	Monthly	Engineer	PMT	No cost
5	Solid and hazardous wastes	Maintain records on waste types and quantities Observe any waste accumulation in unapproved locations	Waste management contracts with authorized contractors Waste delivery receipts from local authorities.	Weekly Weekly	Engineer	PMT	No cost
6	Health and safety	Ensure compliance of workers to Health and Safety requirements Maintain log on accidents	Accidents report	Weekly	Engineer	PMT	No cost
7	Flora & Fauna	Record any observation about wild animals or plants on site or nearby and report to the Environmental Authority	Observation report	Upon occurrence	Engineer	PMT	No cost
8	Topography and landforms	No monitoring required	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
9	Traffic	Ensure speed limits and warning signs are installed	Road signs are installed.	Half annual	Engineer	PMT	No cost
10	Handling Complaints	Ensure that the GRM is effective and well communicated	Number of complaints received, analyzed and responded to.	Weekly	Engineer	PMT	No cost
Total cost US\$ (Operation phase)							US\$ 30,000

7.2 ESMP Institutional Arrangements

In order to ensure full compliance with the environmental and social requirements which are described above, RBD PMT nominated a qualified engineer to act as the focal point for environmental and social affairs at the central level. On the field level, RBD PMT nominated two engineers in Salah Al-Din to act as environmental and social officers. Those engineers will be trained on monitoring and reporting of environmental and social impacts and how to fill the checklist to be used during field visits before implementation starts. RBD Resident Engineer will be the officially responsible staff member for ensuring environmental and social compliance. S/He will be assisted by the designated environmental and social field officers.

In addition, a qualified consultant is recruited by the PMT to provide technical assistance and capacity building to the environmental and social team both at the central level and at the field level.

7.3 Reporting requirements

To ensure that the mitigation and monitoring measures are being carried out effectively with the required frequency, a clearly defined and regular reporting and response system must be established.

All inspection and audit reports of environmental performance should be stored in the Audit and Inspection Manager (AIM) system. The AIM is an electronic database that is used to enable corrective actions identified during the inspection \ auditing process to be recorded, tracked and closed out. The information will be made available to the relevant regulatory authorities as required. In addition to the monitoring and reporting requirements documented in the relevant sections of the ESMP, the following reporting regime will be implemented:

- All incidents or accidents during the bridge rehabilitation should be reported immediately to relevant authorities.
- All corrective measures must be discussed to ensure compliance with laws and regulations.
- Reports for personnel training on environmental issues or emergency practices must be produced.
- Progress reports, environmental monitoring report and other inspections reports must be produced periodically.

7.4 Capacity Development and Resources Requirements

7.4.1 Capacity Development

RBD PMT dedicated sufficient human resources to undertake the environmental and social management requirements as explained above. The assigned RBD staff at the central and field levels are competent in the field of engineering and have variable practical experience. For RBD staff who will be responsible for undertaking the environmental and social tasks, they will require some capacity development.

All construction personnel and contractors are required to undertake appropriate environmental training and induction programs including, importantly, on GRM procedures.

All managers and supervisors will be responsible for ensuring that personnel under their control have the requisite competencies, skill and training to carry out their assigned tasks in accordance with the requirements of the ESMP. They will also be responsible for identifying additional training and competency requirements.

All project supervisors and managers will receive additional detailed training on the use and implementation of the ESMP. The following Table presents the proposed institutional strengthening program and capacity development requirements.

Table 6: Capacity Development Requirements for RBD

Capacity development topic	Provider(s)	Duration	Estimated Cost (US\$)
1 Environmental Impact Assessment Environmental and social Management in Construction Sites	Private sector consultant	3 Days	\$3000
2 Iraqi Environmental Legal Requirements	Ministry of Environment	1 Day	\$2000
3 World Bank Environmental and Social Safeguards	The World Bank	2 Days	\$10,000 (international travel and accommodation cost for RBD trainees)
Total Estimated Cost			\$15,000

7.4.2 Required Resources

In order to ensure full compliance of the environmental and social requirements, regular site visits should be conducted. Dedicated office spaces, office equipment and supplies in addition to adequate means of transportation should be made available for the environmental and social management team at the central level and most importantly on the field level. RBD PMT should ensure the allocation of sufficient budget resources to ensure availing the required resources to achieve the required tasks,

8. PUBLIC CONSULTATION RESULTS

According to the World Bank policies, it is required that broad and open public consultations be held with PAPs on the project. These consultations are to ensure that the project affected peoples (PAPs) are provided with the opportunity to engage in the rehabilitation planning process, to raise questions and receive input and responses to their concerns.

In order to reflect how the project rehabilitation activities will affect the locals, two methods were supposed to be followed. The first one is to hold public gathering and meetings with the locals in order to give them the chance to reflect their ideas, thoughts and reservations (if any). However, due to difficulties and security constraints, this approach was not achievable

The second method, which was actually adopted, was the formulation of a set of questions (Annex 2) which covered the key environmental and social aspects related to the project. The questionnaire was then addressed to a number of the local individuals in the surrounding community randomly to have their opinions and thoughts. To obtain sound and representative information on the possible socio-economic circumstances of the local community members, and better understand any possible adverse socio-economic effects of project activities on PAPs and the local community, local residents were consulted using face-to-face interviews with randomly selected individuals in the vicinity of the bridge and in different areas of the community. The questionnaire forms were distributed in the area for the locals near the bridge in order to reflect their opinion, suggestions, and objections (if exist) regarding the rehabilitation activities.

According to the results revealed from these questioners, the local community individuals agreed that, the rehabilitation activities will have a positive impact on their social daily life. None of the locals expressed any reservations against the project and did not specify any negative impact that might affect him or his family. All locals agreed that the bridge will need some additional safety signs and instructions in order to keep the movement on the bridge within safe conditions. The following are the main findings of the consultation process which took place in April 2016.

1. All questioned locals agreed that the reconstruction activities will have a strong positive impact from the social perspectives on the locals.
2. No claims from any locals were recorded or alleged regarding the ownership of the land where the bridge is constructed; all agreed that it is governmental land property.
3. No vegetation covers, crops, plants, trees... etc. will be removed in order to execute the rehabilitation activities of the bridge.
4. No infrastructure within the bridge area will be affected negatively due to the reconstruction activities.
5. No deportation, dislocation of any of the local community will be needed due to these activities.
6. The reconstruction of the bridge will enhance the social relationship among the locals, improving their transport.
7. All locals agreed that the bridge will need instructional signs for the bridge users' safety.

ANNEXES

Annex (1): Grievance Form

Reference No:

Full Name

My first name _____

Note: you can remain anonymous if you prefer
or request not to disclose your identity to the
third parties without your consent

My last name _____

I wish to raise my grievance anonymously

I request not to disclose my identity without my
consent

Contact information

By Post: Please provide mailing address:

Please mark how you wish to be contacted
(mail, telephone, e-mail).

By Telephone: _____

By E-mail _____

Description of Incident or Grievance:

What happened? Where did it happen? Who did it happen to? What is the result of the problem?

Date of Incident/Grievance

One time incident/grievance (date _____)

Happened more than once (how many times? ____)

On-going (currently experiencing problem)

What would you like to see happen to resolve the problem?

Signature: _____

Date: _____

Please return this form to: [name], _____ [company name] _____
Address _____: Tel.: _____ or E-mail: _____

Annex (2): Questionnaire forms from Public Consultation

اسميان جسرى بصنوعة الصخر والبير

الاسم : علي حيا فلفق

المهنة : مدرس

تاريخ الزيارة : ٢٠١٦ / ٤ / ٢٠

س١: هل تعتقد ان عملية اعادة بناء الجسر /الطريق له اثار ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر /الطريق؟

نعم كلا

س٢: هل هنالك ادعاءات او مطالبات من قبل السكان المحليين بعاندية الارض المقام عليها الجسر /الطريق؟

نعم كلا

س٣: بسبب اعمال إعادة البناء للجسر /الطريق هل تمت عملية ازالة لمحاصيل زراعية أو اشجار أو أي غطاء نباتي تعود عانديته لمواطنين أو السكان المحليين؟

نعم كلا

س٤: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر/الطريق بسبب اعمال اعادة البناء؟

نعم كلا

س٥: هل هنالك أي بنى تحتية مؤقتة اودائمة تلعب دوراً اساسياً في النشاطات الحياتية اليومية للسكان ستأثر بعملية تأهيل الجسر /الطريق؟

نعم كلا

س٦: هل ان اعمال اعادة اعمار الجسر /الطريق ستتسبب بأجراءات اعادة لتوطين لشخص(و/او) لاشخاص الى مناطق جديدة؟

نعم كلا

س٧: هل تمت عملية استخدام منطقة بناء الجسر /الطريق بطريقة ما من قبل السكان المحليين علماً ان الارض تابعة للمولة؟

نعم كلا

س٨: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة اعمال اعادة التأهيل؟ ما هي؟

نعم كلا



س٩: هل هنالك تغييرات ديموغرافية أو ضرر في النسيج الاجتماعي من جراء اعمال اعادة التأهيل؟

نعم كلا

س١٠: ما هي المجالات الأكثر ضعفاً وهشاشة التي من المحتمل ان تتأثر باعمال اعادة التأهيل؟

نعم كلا

س١١: هل سيمرر المشروع من عمليات النقل ويقلل من انعزالية المجتمعات الموجودة بالقرب من منطقة الجسر/الطريق؟

نعم كلا

س١٢: هل يحتاج المواطنون المقيمون بالقرب من الجسر/الطريق الى وضع اعلامات تحذيرية أو استدلالية لزيادة معدلات الامن و الامان لمستخدمي الجسر/الطريق؟

نعم كلا

اسميان جسرى

اسميا ن جسر الضويع الكبير الصغير

الاسم: احمد زياد صدارة

المهنة: موظف

تاريخ الزيارة: ٢٠٠٤ / ١٦

س١: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له آثار ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر / الطريق؟

نعم كلا

س٢: هل هنالك ادعاءات او مطالبات من قبل السكان المحليين بعائدية الارض المقام عليها الجسر / الطريق؟

نعم كلا

س٣: بسبب اعمال إعادة البناء للجسر / الطريق هل تمت عملية إزالة لمحاصيل زراعية أو اشجار أو أي غطاء نباتي تعود عائديته لمواطنين أو السكان المحليين؟

نعم كلا

س٤: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب اعمال إعادة البناء؟

نعم كلا

س٥: هل هنالك أي بني تحتية مؤقتة او دائمية تلعب دوراً أساسياً في النشاطات الحياتية اليومية للسكان ستتأثر بعملية تأهيل الجسر / الطريق؟

نعم كلا

س٦: هل ان اعمال إعادة اعمار الجسر / الطريق ستتسبب بأجراءات إعادة لتوطين لشخص (و/او) لاشخاص الى مناطق جديدة؟

نعم كلا

س٧: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين علماً ان الارض تابعة للدولة؟

نعم كلا

س٨: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة اعمال إعادة التأهيل؟ ما هي؟

نعم كلا لا توجد

س٩:

نعم كلا

س١٠: ما هي المجاميع الاكثر ضعفاً وهشاشة التي من المحتمل ان تتأثر باعمال إعادة التأهيل؟

نعم كلا لا توجد

س١١: هل سيعزز المشروع من عمليات النقل ويقلل من انعزالية المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم كلا

س١٢: هل يحتاج المواطنون المقيمون بالقرب من الجسر / الطريق الى وضع اعلامات تحذيرية أو استدلاية لزيادة معدلات الامن و الامان لمستخدمي الجسر / الطريق؟

نعم كلا

عبد جاد حلق



الاسم : خليل ابراهيم خليل

المهنة : معلم

تاريخ الزيارة : ٢٠١٦ / ٤ / ٢٠

س١: هل تعتقد ان عملية اعادة بناء الجسر /الطريق له اثار ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر /الطريق؟

نعم كلا

س٢: هل هنالك ادعاءات او مطالبات من قبل السكان المحليين بعاندية الارض المقام عليها الجسر /الطريق؟

نعم كلا

س٣: بسبب اعمال إعادة البناء للجسر /الطريق هل تمت عملية إزالة لمحاصيل زراعية أو اشجار أو أي غطاء نباتي تعود عائدته لمواطنين أو السكان المحليين؟

نعم كلا

س٤: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر/الطريق بسبب اعمال اعادة البناء؟

نعم كلا

س٥: هل هنالك أي بني تحتية مؤقتة اودائمة تلعب دوراً اساسياً في النشاطات الحياتية اليومية للسكان ستتأثر بعملية تأهيل الجسر /الطريق؟

نعم كلا

س٦: هل ان اعمال اعادة اعمار الجسر /الطريق ستتسبب بأجراءات اعادة لتوطين لشخص(و/او) لاشخاص الى مناطق جديدة؟

نعم كلا

س٧: هل تمت عملية استخدام منطقة بناء الجسر /الطريق بطريقة ما من قبل السكان المحليين علماً ان الارض تابعة للدولة؟

نعم كلا

س٨: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة اعمال اعادة التأهيل؟ ما هي؟

نعم كلا لا توجد

س٩: هل هنالك تغييرات ديموغرافية او ضرر في النسيج الاجتماعي من جراء اعمال اعادة التأهيل؟

نعم كلا

س١٠: ما هي المجاميع الاكثر ضعفاً وهشاشة التي من المحتمل ان تتأثر باعمال اعادة التأهيل؟

نعم كلا

س١١: هل سيعزز المشروع من عمليات النقل ويقلل من انعزالية المجتمعات الموجودة بالقرب من منطقة الجسر/الطريق؟

نعم كلا

س١٢: هل يحتاج المواطنون المقيمون بالقرب من الجسر /الطريق الى وضع اعلامات تحذيرية او استدلاية لزيادة معدلات الامن و الامان لمستخدمي الجسر/الطريق؟

نعم كلا


 خليل ابراهيم خليل


Annex (3): Site photos



Figure 7: Damaged span in the big bridge



Figure 8: Damaged span in the small bridge (1)



Figure 9: Damaged span in the small bridge (2)