REPUBLIC of IRAQ

KURDISTAN REGIONAL GOVERNMENT

MINISTRY of CONSTRUCTION & HOUSING

GENERAL DIRECTORATE OF ROADS and BRIDGES / DOHUK

Environmental and Social Management Plan for Construction of Overpasses on TCP Segment 2, Duhok -Zakho Road

Executive Summary

This document presents an Environmental and Social Management Plan (ESMP) for the Overpasses Construction on Segment 2 of TCP in Duhok Governorate under the ROAD MAINTENANCE MICROENTERPRISES GRANT PROJECT (MGP) for the benefit of the Northern and Southern of Iraq rural roads.

Brief Project Description

The project is located in Siemel (alternatively Sumel) district of the Duhok (alternative spelling Dahuk or Duhok) Governorate, the Iraqi's northernmost governorate, bordering Syria and Turkey.

The proposed overpasses are located at a distance of approximately 16 km north of the capital city of Duhok of the Duhok Governorate.

The proposed overpasses will be constructed as bridge structures (fly-over) over the existing Duhok-Zakho road. The detailed design of the overpasses at present is being prepared.

One overpass is located at the intersection of Duhok-Zakho road (TCP, Segment 2) with the road leading to the village of Sari Kari to the south, and also, leading to the proposed Duhok Airport (construction is currently suspended) approximately 3.5 km distance to Sari Kari Village.

The second overpass is located at the intersection of Duhok-Zakho Road (TCP, Segment 2) with the road leading to Ibrahim-Khalil Border Crossing as shown below.

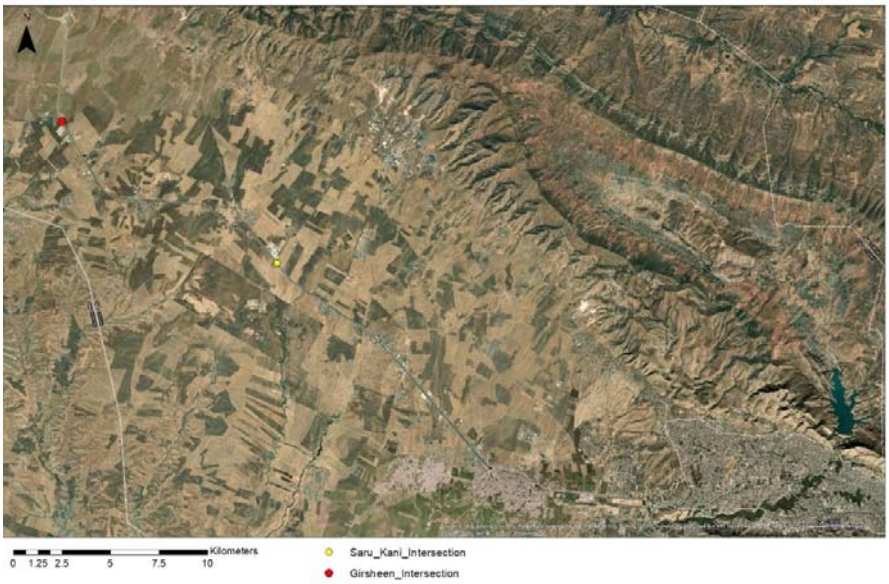

Figure E-1: Location of Overpasses

The project duration is expected to be 6 months.

It is estimated that 83 persons will be deployed for the project.

No permanent or temporary land acquisition for the construction of the overpasses is required since they will be constructed within the ROW of the existing road, property of GDRB.

Legal Framework

The legal Framework comprises the international treaties and conventions that Iraq is a party to, World Bank Environmental and Social Standards, and National Legislation.

Table E-1: Applicable World Bank Environmental and Social Safeguards

Safeguard Policy	Applicability to Sub-Project	Justifications for Applicability
Environmental Assessment (OP/BP 4.01)	Yes	Triggered. The construction of Overpasses is classified as Category B Project, which requires an Environmental and Social Management Plan (ESMP).
Natural Habitats (OP/BP 4.04)	No	No natural reserves or globally or locally important species are located in the vicinity of the project
Forests (OP/BP 4.36)	No	Project areas contain no forests.
Pest Management (OP 4.09)	No	The project will not involve purchasing or using of pesticides.
Physical Cultural Resources (OP/BP 4.11)	No	There are no physical cultural resources in the area of the overpasses. However, if encountered, cultural property management plans will be prepared.
Indigenous Peoples (OP/BP 4.10)	No	No indigenous people are identified in Iraq.
Involuntary Resettlement (OP/BP 4.12)	Yes	Triggered
Safety of Dams (OP/BP 4.37)	No	Not relevant to the proposed Project.
Projects on International Waterways (OP/BP 7.50)	No	Not relevant to the proposed Project.
Projects in Disputed Areas (OP/BP 7.60)	No	Not relevant to the proposed Project.

National Legislation comprises:

- Environmental Law No.2 of 2009
- The Law of Environmental Protection and Improvement Board in the Iraqi Kurdistan Region No. 3, 2010.

- Law of Environmental Protection and Improvement in Iraqi Kurdistan Region No.8, 2008.
- The Law for Investment in Kurdistan Region No. 4, 2006
- Land Acquisition Law No. 12 of 1981
- Law on Public Roads No. 35, 2002 in Kurdistan Region
- Law no. 27 of 2009 on the Protection and Improvement of the Environment
- Law No. 41 of 2015 on Noise Protection and Control Instruction for the Environment Protection and Improvement Board No. 1, 2011
- Labor Law No.37 of 2015 and Ministerial Instruction No.12 of 2016: Occupational Health and Safety Requirements Regulations
- Instructions No. 3/1985 Concerning Occupational Safety
- Law No. 6 of 1988 concerning the National Commission for Occupational Hygiene and Safety
- Regulation No.2 of 2001
- Clean Air Act No. 1 of 2004
- Instruction No. 2, 2011 of KRG Hazardous Substances and Wastes
- Law No.55 of 2002 for The Antiquities & Heritage of Iraq
- The 2005 Constitution of Iraq

Environmental and Social Baseline Conditions

The project is located in the area, which is characterized as sub-humid upland and mountain region with semi-arid Mediterranean climatic conditions. The main annual rainfall ranges between 400 mm and 1 100 mm. The mean minimum in July is about 22°C.

The area that is characterized as undulating terrain. It consists of beds of gravel, conglomerate and sandstones. Gravel and conglomerate layers alternate with thin layers of reddish loam and clay.

The groundwater resources are identified as a shallow aquifer belonging to the Zakho Basin.

Surface water resources comprise seasonal runoff valleys. Generally, all the seasonal streams drain towards the Tigris River. The drainage area is characterized as undeveloped cultivated land with the catchment slopes ranging from 0.09 to 0.15 %.

The area has been subjected to diverse human induced impacts over the millennia such as rain-fed cultivation. Therefore, natural habitats have suffered the significant level of degradation over the past several hundred years. The terrestrial ecosystem is characterized as Middle East Steppe ecosystem.

Vegetation reflects the Mesopotamian province of the Irano-Turanian eco-region and is characterized by the dominance of the drought-tolerant low shrubs with a variety of grasses and legumes.

The area of the project is located in a general area identified as a fly-way route for migratory birds from Eastern Europe and West Siberia to Mesopotamia and Africa.

The project area does not contain any globally important habitats or ecosystems. There are no Nature Reserves or other legally protected areas in the vicinity of the project or in a close proximity.

The total population of Duhok Governorate is about 1 200 000 residents. However, due to the political situation in the region the area witnessed the influx of refugees and IDPs, currently numbering over 1 300 000 people.

The governorate of Dohuk is part of the Kurdistan Region of Iraq (KRI) and is made up by the districts of Dohuk, Amedi, Sumel and Zakho. Kurds are the dominant ethnic group, with small minorities of Turkmen and Arabs living across the governorate. The Sunni branch of Islam is followed by the majority of Dohuk's inhabitants, but the province also hosts a mainly Kurdish Yezidi minority and several Assyrian, Chaldean and Armenian Christian communities.
Duhok is one of the governorates with the lowest poverty numbers. Notwithstanding the higher than average enrollment rates in primary and secondary schools, illiteracy remains a serious problem in the governorate. The number of people living below the poverty line of $2,5 a day also varies between the districts. The number of people with access to an improved water source (96,2%) or improved sanitation facilities (97,3%) are both above the national average, but the public electricity network fails to deliver a consistent source of power to the governorate's inhabitants. Limited transport options and financial means hamper access to health facilities.
The most urgent humanitarian issue currently facing Dohuk governorate is the large number of IDPs in the governorate. IOM estimated in September 2014 that more than 75,000 IDP families were residing in the governorate, the highest number of IDPs in any Iraqi governorate. The governorate is also hosting more than 100,000 Syrian refugees. The influx of IDPs and refugees is putting great stress on the local economy.

Beneficial Project Impacts

During the project's implementation phase, the following benefits are expected:
Provision of the direct job opportunities for skilled and semi-skilled workers: the project is expected to provide 55 of workers needed at specific time during construction phase, including but not limited to: project component, nature of work required, and time plan.

Provision of indirect job opportunities: Economic activity in the project area might be increased through the following supply chain:

- Implementation of works and provision of supplies related to construction, operation and closure of the site and ancillary facilities
- Provision of transportation, freight, and storage services to the project
- Drivers and mini-bus owners will benefit from the transportation of the workers
- Provision of food supplies, catering, and cleaning services
- Provision of construction & auxiliary materials, accessories, engineering, installation, and spare parts
- It is recommended to provide women with work opportunities whenever possible.

After the project implementation, the following positive impacts are expected:

- Improved access to markets, health centers and schools in these areas.
- Improved quality of traveling
- Improved safety, due to improved road condition
- Increased economic activities stemming from the development of businesses and commerce movement.
- Access to information services and remote villages.
- Reducing travelling time which might result in reducing gas expenses.
- Sustainable poverty reduction and local economic and social development.

Anticipated Adverse Project Impacts during Construction Phase

The anticipated adverse project impacts are expected to be minor to moderate.

The minor impacts are:

- Impacts on water resources
- Impacts on soil
- Impacts on Social Settings

The moderate impacts limited in magnitude and severity include:

- Waste generation impacts
- Impact on the ambient air quality
- Impacts of vibration and noise
- Impacts of operations of the construction camp
- Public Health and Safety
- Occupational Health and Safety

Public Consultations

Due to the COVID-19 pandemic, the virtual consultation meeting was held with the relevant stakeholders on 5.11.2020.

The main findings are:

1. No claims were recorded or alleged regarding the ownership of the land where the construction activities to take place; all agreed that is governmental land property.

2. No vegetation cover, crops, plants, trees, etc. will be removed in order to execute the rehabilitation activities.
3. No infrastructure will be affected negatively due the construction activities.
4. Information about a grievance mechanism was introduced. All participants were informed that they can submit their complaint to either site engineer, or to community leader or to PMT during construction.
5. The participants do not anticipate any damage to the buildings or infrastructure during the construction activities.
6. No change to demographics or social structure will be induced by the project activities.
7. Residents do not use any part of the land required for the project for personal purposes.

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 for third party settlement of disputes arising from resettlement. This GRM should take into account the availability of judicial recourse as well as traditional and community dispute resolution mechanisms.

Accordingly, a GRM will be established at the project level to ensure any grievance can be addressed in an amicable manner. Resolving complaints at community level is always encouraged to address the problem that a person may during implementation and/or operational phase.

Environmental and Social Management Plan

Environmental and Social Plan (ESMP) was prepared for construction and operation phases of the project, including mitigation measures to minimize the negative impacts of the project, responsibility for implementation, and cost of implementation.

Table E-2: ESMP during Construction Phase

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
1	Air quality	<u>Vehicle emissions</u> ▪ Contractor to keep vehicles and machinery properly operated and maintained. ▪ Contractor to minimize unnecessary vehicle idling. ▪ Switch off any engine as soon as it is not used. <u>Dust</u> ▪ Minimize dust from materials (such as sand, cement) and construction activities (such as excavation) by using covers, storage, control equipment, and increasing moisture content. ▪ Prepare concrete before going to the site to avoid movement of materials (gravel, sand, cement) if possible ▪ Minimize dust from vehicle movements, using water sprays or appropriate. ▪ Avoid the burning of materials on site. ▪ Switch off any engine as soon as it is not used. <u>Hazardous Emissions</u> ▪ Avoid storage of hazardous materials in open areas without proper covering; ▪ Provide adequate ventilation for work areas	Contractor	Resident Engineer PMT	The bidders will be able to include these costs in their bidding. Additional cost for air quality testing to establish the baseline to be conducted by the third party: 1500 US $
2	Noise	<u>Noise and vibration management</u> ▪ Avoid or minimize transport through community areas. ▪ Switch off any engine as soon as it is not used. ▪ Working at night is prohibited. ▪ Contractor to minimize unnecessary vehicle idling ▪ Muffling of the equipment; ▪ Additional health check-ups for personnel handling the vibrating and noisy equipment	Contractor	Resident Engineer PMT	Additional cost for medical check ups 2000 US $

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
3	Water resources	Water run-off management (drainage plan) ▪ In the event that sediment is transported onto the road it should be cleaned using a street sweeper or by physically sweeping the street in cases of small areas to ensure the sediment is not washed into the drainage system with water runoff. ▪ Raw materials used in construction, which can be carried by water runoff, must be located and stored away from paths for water runoff. ▪ Road curb inlets must be checked and cleaned to ensure the water runoff is flowing into the drainage system. ▪ Where possible or appropriate, schedule works to avoid heavy rainfall periods (i.e. during the dry season) and modify activities during extreme rainfall and high winds. ▪ Carry out any activities that could cause pollution in designated areas ▪ Use topsoil to fill up potential pools to avoid stagnant water ▪ If surface drainage is disturbing the construction process, utilizing ditches, dikes and/or sandbags to divert this drainage from entering excavations	Contractor	Resident Engineer PMT	Hydrogeological Investigation: 500 US $
4	Soil	Soil management ▪ Excavated soil (and/or topsoil) is appropriately stored, and reused for back filling in holes or trenches whenever possible. ▪ Marking excavation with physical boundaries (barriers, tape or fence) ▪ Preventing loose material (soil and equipment) from falling or rolling into the excavation by removing this material to a minimum of 0.5 metre from the edge of the excavation	Contractor	Resident Engineer PMT	Delineation of excavated areas: 300 US $; Emergency soil testing in case of accidental spills: 1000 US $

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
		▪ Disposal of contaminated soil by truck to nearest authorized dumping areas. ▪ Use topsoil to fill up potential pools to avoid stagnant water ▪ If surface drainage is disturbing the construction process, utilizing ditches, dikes and/or sandbags to divert this drainage from entering excavations. Adverse weather Site engineer is to monitor weather on a daily basis. No construction activities to be undertaken in strong winds or rains.			
5	Construction Camp	• Location of the camp should be agreed with the local beneficiaries • Location of the camp outside known aquifer recharge zones • Provision of adequate infrastructure for effluent collection; • Timely disposal of effluent • Timely disposal of solid waste • Provision of collection pits for collection of used machinery oils; • Adequate vehicle maintenance • Transporting wastes to the designated disposal sites	Contractor	Resident Engineer PMT	No additional costs
6	Waste Management	<u>General</u>: ▪ Keeping the site clean and tidy: a. Ensure there is no loose materials or debris lying around the site including the perimeter; and b. Vehicles are regularly checked for cleanliness (general aspect and making sure no leaks are occurring) ▪ Burning of waste is prohibited ▪ Reducing construction waste related to on-site construction and off-site manufacture or fabrication. ▪ Reusing the material on site (in situ or for new applications) whenever it is possible	Contractor	Resident Engineer PMT	Additional costs for disposal of hazardous materials: 3000 US $

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
		▪ Monitoring the amount of site construction waste created to make sure it does not affect the surrounding and the adjacent areas. - Waste is not blocking pathways - Construction waste will be gathered in a specific zone of the construction site ▪ Contractor to evacuate any construction waste that are not possible to reuse, by truck to nearest authorized dumping site pre-agreed with the local authorities and distanced from the environmentally sensitive receptors and on a regular basis to avoid accumulation; ▪ All used motor oil, lubricants, etc. are to be collected in closed bins to avoid leakage and transferred to the refinery for processing ▪ All staff will avoid littering in the open. Workers to use bins to throw garbage. <u>Hazardous materials</u>: ▪ Provide adequate secondary containment for fuel storage tanks and for the temporary storage of other fluids such as lubricating oils and hydraulic fluids. ▪ Use impervious surfaces for refuelling areas and other fluid transfer areas. ▪ Provide portable spill containment and clean-up equipment on site, and train staff in the safe use of it. ▪ Provide adequate sanitation facilities serving all workers (mentioned in HSE). ▪ Paints with toxic ingredients or solvents or lead-based paints will not be used			

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
7	Public Health and Safety	▪ Set up warning signs in the workplace: o All safe footpaths are marked; construction materials are not blocking pathways o Site entrances and exits are clearly marked for visitors and delivery drivers to see; and o If present, site reception is clearly signposted OR all visitors are escorted to the reception. ▪ Providing separate traffic routes for pedestrians and vehicles, where possible ▪ Guiding traffic into a single lane and meeting traffic needs to be regulated only allowing traffic to pass in one direction at the time. The most common method of regulating traffic on rural roads is to employ flagmen with stop/go signs at both ends of the diversion when the route diversion is initiated. For longer duration the signs of diversion should be installed equipped with lighting for night hours. ▪ Designating specific parking areas for workers' and visitors' vehicles outside the construction area. ▪ Avoid or minimize transport through community areas. ▪ In compliance with national regulations the Contractor will ensure that the construction site is properly secured and construction related traffic regulated. ▪ There is posted material indicating the nearest police station and hospital (with accident and emergency facilities). ▪ The contractor must take reasonable steps to prevent unauthorized people accessing the site. ▪ fatalities and serious accidents are promptly reported to the Bank through the P.M.T. ▪ The site will be clearly visible and the public warned of all potential hazards by signposting and barriers / fencing	Contractor	Resident Engineer PMT	Additional costs for marking and signage: 300 US $

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
		▪ Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for pedestrians where construction traffic interferes. ▪ Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement ▪ If required, active traffic management by trained and visible staff at the site for safe passage for the public ▪ Ensuring safe and continuous access to all adjacent office facilities, shops and residences during construction			
8	Occupational Health and Safety	▪ There is posted material indicating the nearest police station and hospital (with accident and emergency facilities). ▪ The contractor must take reasonable steps to prevent unauthorized people accessing the site. ▪ Training on handling of UXO/ERW ▪ Avoid the burning of materials on site. ▪ Provide a first aid kits in different places of the work site with the appropriate number of materials given the number of workers on site. The locations of the first aid kits will be provided to all workers. ▪ Providing extinguishers on work site. ▪ If work involving the use of flammable materials is being carried out, stop people smoking and do not allow other work activities involving potential ignition sources to take place nearby. ▪ Providing site boundaries by installing suitable physical boundaries (barriers, tape or fence). ▪ Marking excavation holes with physical boundaries (barriers, tape or fence)	Contractor	Resident Engineer PMT	No additional costs; the cost is imbedded in mandatory HSE measures

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
		▪ The contractor should put up barriers or covers in the area of openings and excavations. ▪ Store building materials (such as pipes, manhole rings, and cement bags) so that they cannot topple or roll over. ▪ Keep walkways and stairways free of tripping hazards such as trailing cables, building materials, and debris. ▪ Everyone who works on any site must have access to adequate toilet and washing facilities, a place for preparing and consuming refreshments, and an area for storing and drying clothing and personal protective equipment (PPE). ▪ Contractor to ensure PPE (personal protective equipment) is used by all workers on site. ▪ Materials and equipment are tidily stacked, protected and covered where necessary. Additionally, there is adequate space for new materials to be stored in secured covered areas to avoid damage, theft, and to protect these items from weather conditions. ▪ Scaffolding for work in elevated areas should comply with the OSHA "General Requirements for Scaffolds §1926.451" ▪ Falling accidents are the main risks of working on heights. The workers should be provided with the full-body harness and comply with the use of it at all times. ▪ Prepare the evacuation plan for the workers in case of acts of terrorism and violence in the area that threaten the safety of the personnel; ▪ Establish the evacuation routes and agreement with the authorities and army for evacuation and transferring injured personnel to the hospitals ▪ Implement an Emergency Response Plan to manage major incidents if they should occur, such as equipment accidents in the vicinity of the construction site.			

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
		▪ Adopt and implement a health management system for the workers, to ensure through medical check-ups, they are fit for work and that they will not introduce disease into local communities ▪ Child labor is prohibited in all of RBD Projects Financed by World bank. All of the contractor workers should be registered and age verified by the Social officers and the PMTs. Children below 18 will not be recruited			
9	Handling Complaints	▪ Reducing impacts on the community through community and neighbour engagement. ▪ In cases of where there are minority communities speaking a different language in the area or working on site, notices are printed in the common local language. ▪ Provide the proper GRM for handling complaints	Resident Engineer	PMT	No additional costs
10	Physical cultural resources	▪ In case of accidental discovery stop all works and contact the responsible authority within 24 hours; ▪ Provide training to the construction crew on the mode of conduct in case of accidental findings	Resident Engineer	PMT	No additional costs
11	Workers Influx/Workforce-Community Interactions	• Prepare, adopt and implement a project and workers Grievance Redress Mechanism (GRM). • Develop work procedures, defining a Code of Appropriate Conduct for all workers, including acceptable behavior with respect to community interactions and train workers on its content. • Ensure the provision of information regarding Worker Code of Conduct in local language. • Contractor to avoid hiring “at the gate” to discourage spontaneous influx of job seekers	Contractor	PMT	No additional costs

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
		• Train all workers on GBV risks and related sanctions. • Ensure that management and security staff are adequately trained to identify and eradicate all forms pertaining to GBV and gender-based discrimination. • Introduction of strict sanctions (i.e. dismissal) for workers involved in any form of abuse, inappropriate behavior or GBV • Considering ways to minimize entry/exit to site or the workplace, and limiting contact between workers and the community/general public • Implementing a communication strategy with the community, community leaders and local government in relation to COVID-19 issues on the site.			
Total cost US$ (construction phase)					10,000 US $

Table E-3: ESMP during Operation Phase

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
1	Air quality including odors	▪ Water spraying for dust control in maintenance areas; ▪ Draining of ponds to prevent stagnation; ▪ Provide traffic regulation measures to avoid traffic congestion.	Operator	RBD	Included in regular maintenance costs
2	Noise	▪ Advance warning to public ahead of planned maintenance and repair activities; ▪ Restriction on maintenance activities on working hours to 8.00-19.00 during working days and avoidance of works during holidays unless needed on emergency basis.	Operator	RBD	Included in regular maintenance costs

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
		▪ Provide traffic regulation measures to avoid traffic congestion.			
3	Traffic	▪ Informing the public about schedule of repair and maintenance works ▪ Provision of temporary alternative access roads/ by-passes ▪ On the spot traffic management	Operator	RBD	Included in regular maintenance costs
4	Handling Complains	▪ Compliance with GRM for one year following opening of the overpasses 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	Operator	RBD	Included in regular maintenance costs
5	Water resources	▪ Timely and adequate disposal of debris generated by maintenance activities and solid and liquid waste; ▪ Maintaining the drainage ditches and manholes unblocked	Operator	RBD	Included in regular maintenance costs
6	Soil	▪ Maintaining the drainage channels unblocked; ▪ Adequate disposal of waste	Operator	RBD	Included in regular maintenance costs
7	Solid and hazardous wastes	▪ Use of non-toxic paints for repairs; ▪ Storage of hazardous materials used for repairs in sealed containers; ▪ Disposal of waste to authorized disposal sites;	Operator	RBD	Included in regular maintenance costs
Total cost US$ (Operation phase)					No additional costs

Environmental and Social Monitoring Plan

The ESMP will be shared with the contractor who will be contractually obligated to abide by it, with financial clauses associated to this obligation. Impacts are mitigated by detailed mitigation measures.

The following tables present monitoring measures in order to perform a non-harmful implementation of the project works to the environment and to reduce the risk of negative environmental impacts as far as possible.

Table E-4: Monitoring Activities during Construction Phase

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
1	Air quality including odors	Site inspection with the photo documentation; Air quality testing near sensitive receptors	• Ambient Air quality parameters:PM10, PM2.5, SO2, NOx, CO, Ozone and HC • Compliance with dust abatement measures • Upon receiving a complaint	Upon receiving a complaint	Contractor through approved third party.	Resident engineer	Testing done by accredited laboratories. Additional cost 2000 US $
2	Noise	Site inspection measuring the level of noise near sensitive receptors	• Compliance with the time limitations; • Switching off the equipment not in use; • Use of protective gear	Upon receiving a complaint	Contractor	Resident engineer	Included in air quality testing
3	Water resources	• Site inspection with photo documentation; • Water testing close to construction site	Inspection: • debris accumulation in water drainage areas; • Alteration of water courses; • Signs of spillage of hazardous materials Water testing: pH, Turbidity, Electrical Conductivity (EC), Color, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Chemical	Inspection: • Bi-weekly during the rainy season, and after sporadic rains • Once a month during the dry periods Water testing: in case of spillage of hazardous materials in surface water courses	Contractor through approved third party.	Resident engineer	Testing done by accredited laboratories. Additional cost 3000 US $

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
			Oxygen Demand (COD), Biological Oxygen Demand (BOD), Polychlorinated Biphenyls (PCBs)	Upon receiving a complaint			
4	Soil	• Site inspection with photo documentation; • Soil testing close to construction site	Inspection: signs of soil erosion, evidence of spills of fuel and lubricants Soil testing: pH, temperature, organic content, poly-aromatic hydrocarbons (PAHs); Faecal coliforms and Total coliforms	• Inspection: bi-weekly; • Soil testing in case of accidental spills • Upon receiving a complaint	Contractor through approved third party.	Resident engineer	Testing done by accredited laboratories. Additional cost 3000 US $
5	Waste Management	• Site inspections • Maintaining a record of type, quantity, and disposal location of solid and liquid waste generation;	• Storage conditions of hazardous materials; • Disposal at designated sites • Contracts with approved waste disposal contractors • Receipts form disposal sites (if available) • Photo documentation	Inspection: bi-weekly	Contractor	Resident engineer	No additional costs
6	Construction Camp	• Site inspections	• Storage conditions of hazardous materials; • Disposal at designated sites • Contracts with approved waste disposal contractors • Receipts form disposal sites (if available)	Inspection: bi-weekly	Contractor	Resident engineer	No additional costs

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
			• Photo documentation				
7	Traffic	Site inspections	Site surveillance for the presence of fencing/barriers and warning signs, and traffic speed limitations Records on any traffic accidents project-related	Monthly	Contractor	Resident engineer	No additional costs
8	Handling Complains	• Maintaining records of filed complaints and responses	• Time of response to the complaint; • Number of complaints	Monthly	Resident engineer	PMT	No additional costs
9	Public health and safety	• Inspection and photo evidence • Maintaining records of injuries and accidents with cause and location	• Provision and use of personal protective equipment to workers • Installing construction and warning signs	Inspection: bi-weekly	Contractor	Resident engineer	No additional costs
10	Occupational Health and Safety	• Contractor is to prepare OHS Plan to be improved by the supervision Engineer according to the OSHA guidelines • Monitor and report on implementation and integration of H&S Plan by all project personnel throughout the project.	• activities and facilities are in compliance with the H&S Plan • Complaints raised from the workers • Number of accidents/ injuries and occupational diseases, incl. presence of communicable diseases (e.g. COVID 19) and pathogenic agents • OHS Plans • Trainings performed and recorded • PPE used by workers	Daily	Contractor	Resident Engineer	No additional costs

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
			• Fire prevention equipment in place				
11	Workers Influx/Workforce-Community Interactions	All mitigation measures have been implemented (in specific those related to the code of conduct including GBV and other labor influx risks,) The Code of Conduct has been prepared and formally adopted Number of complaints received from the community with regards to workers' behavior in general and the time it took to solve them. Training records % of workers trained on Code of Conduct % of workers trained on GBV	• Number of complaints received from the community with regards to workers' behavior in general and the time it took to solve them. Training records % of workers trained on Code of Conduct % of workers trained on GBV	Monthly	Contractor	Resident Engineer	No additional costs
Total cost US$ (Construction phase)							8,000US $
Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
1	Air quality including odors	Site inspection with the photo documentation; Air quality testing near sensitive receptors	• Ambient Air quality parameters:PM10, PM2.5, SO2, NOx, CO, Ozone and HC • Compliance with dust abatement measures • Upon receiving a complaint	Upon receiving a complaint	Contractor through approved third party.	Resident engineer	Testing done by accredited laboratories. Additional cost 2000 US $
2	Noise	Site inspection measuring the level of noise near sensitive receptors	• Compliance with the time limitations; • Switching off the equipment not in use; • Use of protective gear	Upon receiving a complaint	Contractor	Resident engineer	Included in air quality testing
3	Water resources	• Site inspection with photo documentation; • Water testing close to construction site	Inspection: • debris accumulation in water drainage areas; • Alteration of water courses; • Signs of spillage of hazardous materials Water testing: pH, Turbidity, Electrical Conductivity (EC), Color, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Chemical Oxygen Demand (COD), Biological Oxygen Demand	Inspection: • Bi-weekly during the rainy season, and after sporadic rains • Once a month during the dry periods Water testing: in case of spillage of hazardous materials in surface water courses	Contractor through approved third party.	Resident engineer	Testing done by accredited laboratories. Additional cost 3000 US $

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
			(BOD), Polychlorinated Biphenyls (PCBs)	Upon receiving a complaint			
4	Soil	• Site inspection with photo documentation; • Soil testing close to construction site	Inspection: signs of soil erosion, evidence of spills of fuel and lubricants Soil testing: pH, temperature, organic content, poly-aromatic hydrocarbons (PAHs); Faecal coliforms and Total coliforms	• Inspection: bi-weekly; • Soil testing in case of accidental spills • Upon receiving a complaint	Contractor through approved third party.	Resident engineer	Testing done by accredited laboratories. Additional cost 3000 US $
5	Waste Management	• Site inspections • Maintaining a record of type, quantity, and disposal location of solid and liquid waste generation;	• Storage conditions of hazardous materials; • Disposal at designated sites • Contracts with approved waste disposal contractors • Receipts form disposal sites (if available) • Photo documentation	Inspection: bi-weekly	Contractor	Resident engineer	No additional costs
6	Construction Camp	• Site inspections	• Storage conditions of hazardous materials; • Disposal at designated sites • Contracts with approved waste disposal contractors • Receipts form disposal sites (if available) • Photo documentation	Inspection: bi-weekly	Contractor	Resident engineer	No additional costs

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
7	Traffic	Site inspections	Site surveillance for the presence of fencing/barriers and warning signs, and traffic speed limitations Records on any traffic accidents project-related	Monthly	Contractor	Resident engineer	No additional costs
8	Handling Complains	• Maintaining records of filed complaints and responses	• Time of response to the complaint; • Number of complaints	Monthly	Resident engineer	PMT	No additional costs
9	Public health and safety	• Inspection and photo evidence • Maintaining records of injuries and accidents with cause and location	• Provision and use of personal protective equipment to workers • Installing construction and warning signs	Inspection: bi-weekly	Contractor	Resident engineer	No additional costs
10	Occupational Health and Safety	• Contractor is to prepare OHS Plan to be improved by the supervision Engineer according to the OSHA guidelines • Monitor and report on implementation and integration of H&S Plan by all project personnel throughout the project.	• activities and facilities are in compliance with the H&S Plan • Complaints raised from the workers • Number of accidents/ injuries and occupational diseases, incl. presence of communicable diseases (e.g. COVID 19) and pathogenic agents • OHS Plans • Trainings performed and recorded • PPE used by workers • Fire prevention equipment in place	Daily	Contractor	Resident Engineer	No additional costs

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
11	Workers Influx/Workforce-Community Interactions	All mitigation measures have been implemented (in specific those related to the code of conduct including GBV and other labor influx risks,) The Code of Conduct has been prepared and formally adopted Number of complaints received from the community with regards to workers' behavior in general and the time it took to solve them. Training records % of workers trained on Code of Conduct % of workers trained on GBV	• Number of complaints received from the community with regards to workers' behavior in general and the time it took to solve them. Training records % of workers trained on Code of Conduct % of workers trained on GBV	Monthly	Contractor	Resident Engineer	No additional costs
Total cost US$ (Construction phase)							8,000US $

Table E-5: Monitoring during Operation Phase

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
1	Air quality	Air quality monitoring	Ensure the bridge in the operational condition and there are no hold ups of traffic that can produce excessive exhaust emissions; Inspection on the dust generation by the vehicles	Upon receiving a complaint	Operator	GDRB	No additional costs
2	Noise	Noise level monitoring	Ensure the noise levels are within the acceptable limits	Upon receiving a complaint	Operator	GDRB	No additional costs
3	Water resources	• Surveillance; • Water testing	• Ensure the drainage channels and culverts are clear of debris • Visual inspection for the signs of spillage • Water quality testing: pH, Turbidity, Electrical Conductivity (EC), Color, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD),	Surveillance: • Bi-weekly during the rainy season • Monthly during the dry season Water testing: in case of accidental spills Upon receiving a complaint	Operator	GDRB	500 for water testing

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
			Polychlorinated Biphenyls (PCBs)				
4	Soil	• Surveillance; • Soil testing	• Ensure the drainage channels and culverts are clear of debris • Visual inspection for the signs of spillage • Soil testing: pH, temperature, organic content, poly-aromatic hydrocarbons (PAHs)	Surveillance: • Bi-weekly during the rainy season • Monthly during the dry season Soil testing in areas of the accidental spills and upon receiving a complaint	Operator	GDRB	300 for soil testing
5	Solid and hazardous wastes	• Surveillance; • Maintaining records of quantities of waste and location of its disposal	Waste disposed at designated areas	Monthly	Operator	GDRB	No additional costs
8	Access and traffic	• Surveillance	Presence of warning signs at maintenance site	During maintenance and repair works	Operator	GDRB	No additional costs
9	Health and Safety	• Surveillance; • Maintaining records of quantities of waste and location of its disposal	• Adequate warning about scheduled maintenance works; • Timely and adequate disposal of waste	Monthly	Operator	GDRB	No additional costs
10	Handling Complaints	Record keeping on received complaints	Number of complaints and responses	Quarterly	Operator	GDRB	No additional costs
Total cost US$ (Operation/Maintenance phase)							800 US $ per year

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Acronyms and Abbreviations

AXO	Abandoned explosive ordnance
EHS	Environment, Health and Safety
ESMP	Environmental and Social Management Plan
HSE	Health Safety and Environment
GDRB	General Directorate of Roads and Bridges
GRM	Grievance Redress Mechanism
IBRD	International Bank for Reconstruction and Development
MGP	Microenterprise Grant Project
PDO	Project Development Objective
PMT	Project Management Team
ROW	Right of Way
TCP	Transport Corridor Project
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
TOR	Terms of Reference
UNCBD	United Nations Convention on Biological Diversity
UNCCD	United Nations Convention to Combat Desertification
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UXO	Unexploded ordnance
WBG	World Bank Group

1 Introduction

This document presents an Environmental and Social Management Plan (ESMP) for the Overpasses Construction on Segment 2 of TCP in Duhok Governorate under the ROAD MAINTENANCE MICROENTERPRISES GRANT PROJECT (MGP) for the benefit of the Northern and Southern of Iraq rural roads. The Government of Iraq, with the support of the World Bank, aim to provide opportunities to improve the livelihoods of poor rural people and to maintain the level of access to rural roads. The Project Development Objective (PDO) of the parent TCP is to improve road transport connectivity and safety on selected road sections along Duhok – Zakho Highway in the Kurdistan regional part of the country.

1.1 Project Rationale

The construction of overpasses will contribute to better transport links along the main trade corridors and cross-border trade facilitation. Better transport links enable improved traffic conditions and increase level of traffic safety - two major problems along the existing road network. Most of imported products is currently being transported along the network with inappropriate standard for such traffic volumes (from Europe and Turkey).

It is estimated that approximately 8,500 vehicles use the Duhok-Zakho Road per day in both directions. Access of the vehicles through unsignalized intersection is considered as a significant safety hazard. For the period of 13/3/2020 to 24/9/2020 the total number of accidents recorded is 73. The percentage of accidents resulting in injuries is 5.48% and injury rate is 46 injury per million vehicle km.

Provision of overpasses in the proposed locations will facilitate the traffic movement along the Transport Corridor and improve the safety on the road.

1.2 Objective of ESMP

The objective of this ESMP is to provide an environmental and social management process and guidance for the design and implementation of this Project and to provide a practical tool during project formulation, design, planning, implementation and monitoring to ensure that environmental and social aspects are duly considered in the process in accordance with the Bank policies. It describes the steps involved in identifying and mitigating the potential environmental and social impacts of the Project. A mitigation hierarchy approach has been adopted during the development of this ESMP in order to: avoid risks and impacts when possible; minimize or reduce risks and impacts to acceptable levels where avoidance was not possible; mitigate; and compensate for remaining significant residual impacts or offset them.

The ESMP proposes high-level principles, guidelines and procedures to screen, assess, approve, manage and monitor the mitigation measures of environmental and social impacts of the project activities/subprojects. The output of this ESMP is intended to ensure that the proposed project will be environmentally and socially sound and sustainable.

1.3 Scope of ESMP

The World Bank Operational Policy 4.01 on Environmental Assessment was triggered as the proposed Project has some potential negative E&S impacts. Accordingly, this ESMP is required to implement the project in accordance with the requirements of the World Bank's Operational Procedures and applicable Iraqi national legislation. It provides an overview of the E&S baseline conditions of the area of influence, summarizes the potential impacts associated with the proposed construction works, and sets out the management measures required to mitigate and monitor any potential negative impacts.

2 Project Description

2.1 Project Location

The project is located in Siemel (alternatively Sumel) district of the Duhok (alternative spelling Dahuk or Duhok) Governorate, the Iraqi's northernmost governorate, bordering Syria and Turkey.

Figure 1: Map of Duhok Governorate[1]

One overpass is located at the intersection of Duhok-Zakho Road (TCP, Segment 2) approximately 23 km north of Duhok with the road leading to the village of Sari Kari to the south, and also, leading to the proposed Duhok Airport (construction is currently suspended) approximately 3.5 km distance to Sari Kari Village.

The second overpass is located at the intersection of Duhok-Zakho Road (TCP, Segment 2) approximately 36 km north of Duhok with the road leading to Ibrahim-Khalil Border Crossing.

The location of overpasses is shown in Figure below:

[1] Source map: Joint Analysis and Policy Unit

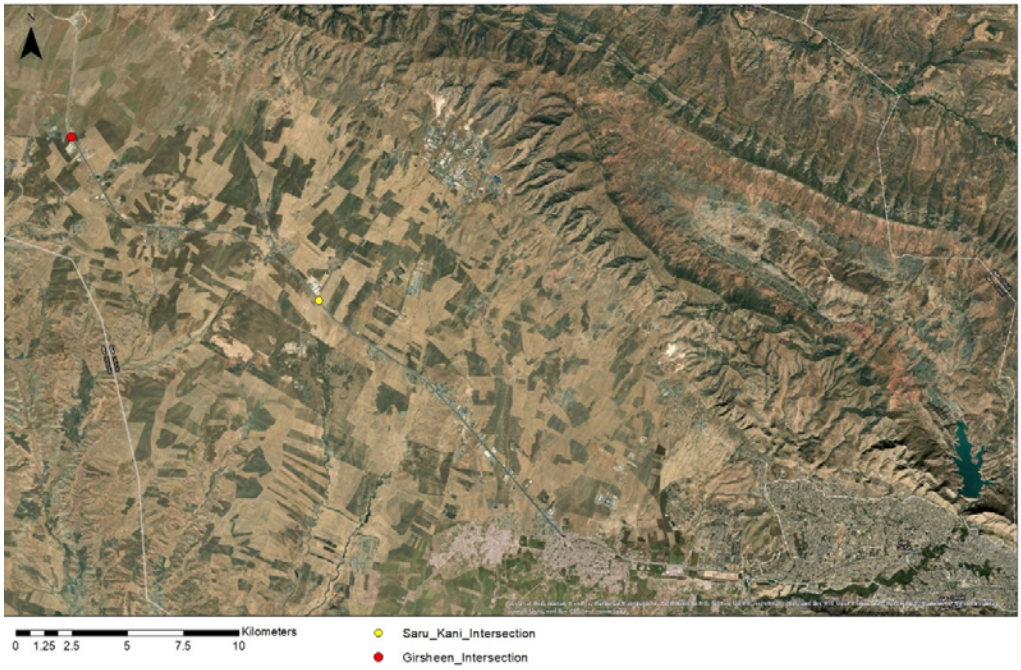

Figure 2: Location of Overpasses on Duhok-Ibrahim Khalil Road (Segment 2 of TCP)

2.2 Adjacent Land Use

2.2.1 Proposed Overpass at Saru Kani Intersection

The immediate surrounding to the Saru Kani Intersection comprises mostly agricultural land with seasonal cultivation of cereals and limited livestock grazing with some scattered houses and a warehouse of Safa Company. The nearest village is Saru Kani located at a distance of approximately 3.5 km from the intersection. There is a diversion road on both sides of the intersection constructed during the rehabilitation of Segment 2. Also, some vacant spaces near the intersection are used by trucks for temporary parking.

Land to be used for the proposed overpass is the property of GDRB. No temporary or permanent land acquisition will be required.

Figure 3: Area adjacent to Saru Kani Intersection (Proposed Overpass 1)

Figure 4: Photos from Location of the proposed Saru Kani Overpass

2.2.2 Proposed Overpass at Girsheen Intersection

The second overpass is located at the intersection of Duhok-Zakho Road (TCP, Segment 2) with the road leading to Ibrahim-Khalil Border Crossing as shown below.

Figure 5: Location of the proposed Girsheen Overpass

Figure 6: Photos from Girheen Intersection

The adjacent area is predominantly agricultural. There is a fuel station at the location of the interchange and some small businesses, such as mini grocery shops near it. Also, a lot of vehicles coming from Ibrahim Khalil Border Crossing use it as a temporary stop area.

No permanent or temporary land acquisition for the construction of the overpass is required since it will be constructed within the ROW of the existing road, property of GDRB.

2.3 Project Objectives

The proposed project goal is to improve road transport connectivity and safety on selected road sections along Duhok – Zakho Highway in the Kurdistan regional part of the country. The proposed project objectives are:

- to facilitate the traffic flow through the intersections
- reduce the travel time and improve access to markets, health centers and schools for the local communities.
- Improve safety of the intersections.

2.4 Equipment and Materials

Equipment can be divided into machinery for major construction purposes: clearing, earthmoving, shaping, and compacting; producing and handling the road-making aggregate; laying asphalt and concrete; placing and compacting the pavement layers; and constructing bridges.

The typical equipment and machinery are presented in the Table below:

Table 1: Machinery and Equipment

Activity	Machinery and Equipment
Clearing	Bulldozer
	Front End Loader
	Jack Hammer
	Crane with Ball
Excavation & Earth Moving	Bulldozer
	Backhoe
	Front End Loader
	Dump truck
	Jack Hammer
	Scraper
Structure Construction	Crane
	Welding Generator
	Concrete Mixer
	Concrete Pump
	Concrete Vibrator
	Air Compressor
	Pneumatic Tools
	Bulldozer

Activity	Machinery and Equipment
	Cement and Dump Trucks
	Front End Loader
	Dump truck
	Paver
Grading and Compacting	Grader
Landscaping & Clean-Up	Bulldozer

Materials used for overpass construction include soils (possible re-use of cut materials), aggregates, cement mixes, asphalt mixes, geo-synthetics, composites, metals including steel and aluminum, wood materials. Significant water consumption is anticipated for the project for the following:

- Concrete batching plant with capacity of 400 m^3/day requires around 100 m^3/day of water
- Spraying for prevention of dust generation
- Human consumption

2.5 Project Facilities

For the execution of the works the following types of construction camps are likely to be required:

- A Main Camp, the operational center, with prefabricated offices and parking areas for administration and technical staff. This will also include areas for materials testing and storage, and equipment cleaning and maintenance. The need for residential accommodation is likely to be relatively minor
- Construction Yards, comprising rock crushing and screening plant, pre-cast concrete yards, asphalt and concrete batching plants
- Temporary Camps may be needed at specific sites such as bridge crossings, where there will be a short-term concentration of equipment, materials and labor.

2.6 Estimate of the Staffing Requirements

The estimate of the staffing requirements is presented in the Table below:

Table 2: Estimate of Staffing Requirements

Type	Job Title	Number
Administrative Staff	Secretary	1
	IT support	1
	Serving personnel	2
	Security personnel	3
	Parking attendants	2
	Logistics Coordinator	1
	Warehouse/storage coordinator	2

Type	Job Title	Number
	HR officer	1
	Procurement officer	1
Technical Staff	General Manager/Team Leader	1
	Senior Road Engineer	1
	Materials Engineer	1
	Road Engineer	2
	Structural Engineer	1
	Geo-technical Engineer	1
	Drainage Engineer	1
	Pavement Engineer	1
	Quantity Surveyor	1
	HS&E specialist	2
	Social expert	1
	Quality Assurance Engineer	1
Construction Crew	Machinery and equipment operators	25
	Unskilled labor	30
Total		**83**

2.7 Construction Activities

The expected duration of the project is 6 months.

Table 3: Duration of Project Activities

#	Activity	Duration (man days)
1	Cleaning	128
2	Columns construction	145
3	Girders installation	125
4	Cleaning road cracks	35
5	Structural repairs of the approaches	65
6	Paving	65
7	Installation of guardrails and lighting	48
8	Installation of communication lines	42
9	Installation of traffic and warning signage	24

3 Legal and Institutional Framework

This section highlights the key World Bank and National requirements likely to be relevant to the project. National legislations and standards, are compared against the WB's Environmental, Health, and Safety Guidelines (referred to as the EHS Guidelines). These are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). They contain the performance levels and measures that are normally acceptable to the WB. ESIA/ESMP should be revisited upon finalizing project design.

The project has been classified as a "Moderate Risk" project; meaning that the potential E&S impacts of the project are less adverse & more limited, fewer, site-specific, likely reversible as compared with High and Substantial Risk projects, and mitigation measures can be more easily designed/implemented.

The ESMP shall comply with the Environmental and Social Safeguards of the World Bank (WB) as well as the national requirements. The relevant levels or measures of the EHS Guidelines or the national requirements, whichever is more stringent, will be applied.

3.1 International Conventions and Treaties

The number of international conventions were signed and ratified by the Iraqi Government. The following lists the international conventions and treaties that have been signed and ratified by the Iraqi Government.

- UN Convention for Biological Diversity (UNCBD)
- UN Convention to Combat Desertification (UNCCD)
- UNESCO World Heritage Convention
- United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol
- ILO conventions

3.2 World Bank Environmental and Social Safeguards

The Project will include civil work activities, which are very localized. However, some small-scale environmental and social impacts can result from the Project, though, site-specific and reversible. The Project has already been classified as Category "B" according to OP/BP 4.01 Environmental Assessment. Only two Bank's operational policies and procedures were triggered, and these are: OP/BP 4.01 Environmental Assessment, and OP/BP 4.12 Involuntary Resettlement. Annex 2 provides an overview to the requirements of OP/BP's 4.01 and 4.12. Additionally, the Bank's policies on Accessing Information, and the IFC's Guideline for Environmental Health and Safety applies as well, throughout the implementation of the Project. Relevant Bank policies, procedures and guidelines are described in the following sections:

The WB has defined 10 E&S safeguard policies that should be considered in its financed projects. The proposed Project is classified as Category B according to the World Bank. This mandates an Environmental and Social Management Plan (ESMP).

Table 4: World Bank Safeguard Operational Policies and their Applicability to the Project

Safeguard Policy	Applicability to Sub-Project	Justifications for Applicability
Environmental Assessment (OP/BP 4.01)	Yes	The construction of Overpasses is classified as Category B Project, which requires an Environmental and Social Management Plan (ESMP).
Natural Habitats (OP/BP 4.04)	No	No natural reserves or globally or locally important species are located in the vicinity of the project
Forests (OP/BP 4.36)	No	Project areas contain no forests.
Pest Management (OP 4.09)	No	The project will not involve purchasing or using of pesticides.
Physical Cultural Resources (OP/BP 4.11)	No	There are no physical cultural resources in the area of the overpasses. However, if encountered, cultural property management plans will be prepared.
Indigenous Peoples (OP/BP 4.10)	No	No indigenous people are identified in Iraq.
Involuntary Resettlement (OP/BP 4.12)	Yes	Triggered
Safety of Dams (OP/BP 4.37)	No	Not relevant to the proposed Project.
Projects on International Waterways (OP/BP 7.50)	No	Not relevant to the proposed Project.
Projects in Disputed Areas (OP/BP 7.60)	No	Not relevant to the proposed Project.

3.2.1 World Bank Policy on Access to Information

This Policy governs the public accessibility of information in the Bank's possession. The World Bank allows access to any information in its possession that is not on a list of exceptions.

This Policy is based on five principles:

- Maximizing access to information
- Setting out a clear list of exceptions
- Safeguarding the deliberative process
- Providing clear procedures for making information available; and
- Recognizing requesters' right to an appeals process.

3.2 World Bank Group EHS Guidelines

The WBG EHS Guidelines[2] are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). They contain the performance levels and measures that are normally acceptable to the WB Group. The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. The following areas are key to the project activities:

1. Ambient air quality: The Project activities are expected to result in various air emissions, both during construction, and operation. The EHS guideline has put measures to manage air pollution, both gaseous emissions and particulate matter, which include, but limited to, use of dust control methods, such as covers, water suppression, or increased moisture content for open materials storage piles, and use of water suppression for control of loose materials on paved or unpaved road surfaces. As the project will involve the use of heavy machinery, the guideline has also put measures for reducing GHGs emissions from machinery and road vehicles, which include, but not limited to, enhancement of energy efficiency, and increased use of renewable forms of energy.
2. Wastewater and ambient water quality: the EHS guideline described stormwater runoff as those containing suspended sediments, metals, petroleum hydrocarbons, Polycyclic Aromatic Hydrocarbons (PAHs), coliform, etc. Rapid runoff, even of uncontaminated stormwater, also degrades the quality of the receiving water by eroding stream beds and banks. Reduction principles in this regard include, but not limited to, separation from other streams for treatment, prevent surface runoff, reduce sediment movement by capping and impounding material stockpiles, and segregate from less contaminated runoff, if possible, as well as the use of oil-water separators and grease traps at workshops and refueling facilities.

3. Hazardous materials management: these were defined as materials that represent a risk to human health, property, or the environment due to their physical or chemical characteristics. The project will include use of various oils and lubricants, and others, which are expected to adversely impact the immediate environment and workers. Management includes release prevention and control planning. These include training of operators on release prevention,

[2]https://www.ifc.org/wps/wcm/connect/29f5137d-6e17-4660-b1f9-02bf561935e5/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES&CVID=jOWim3p

inspection programs, use of personal protective equipment (PPE), preparation of standard operating procedures (SOPs), use of second containment tanks, segregation from domestic waste streams, proper storage, spill emergency preparedness, and others.

4. Waste Management: guidelines for waste management include a range of control measures, starting from minimizing waste generation, proper handling, treatment, segregation, storage, disposal, and transport, as well as opportunities for reuse and recycling. In addition to hazardous waste, working camps during implementation is expected to generate wastewater, excavation waste and debris, as well as domestic waste.

5. Noise and vibration: implementation of the project will include excavation and construction work, and heavy usage of machinery, which will result in elevated levels of noise and vibration. The EHS guideline has put noise thresholds, and a number of management controls. These include, among others: selecting equipment with lower sound power levels, installing mufflers on engine exhausts, limiting hours of operation especially through community areas, setting construction plants far from residential areas, and reducing vehicle routing through community areas.

6. Contaminated Land: the guideline has highlighted a number of risks from contaminated land. For instance, risks to human health and ecology (health effects, loss of ecology), as well as liability that it may pose to the polluter/business owner. The preferred strategy for land decontamination is to reduce the level of contamination at the site while preventing the human exposure to contamination. A range of mitigation strategies were proposed, which include, but not limited to: limiting or preventing access to contaminated land, minimizing exposure, educating surrounding communities and workers onsite. As for pathways, capping contaminated soil with at least 1m of clean soil to prevent contact, as well as paving over contaminated soil as an interim measure.

7. Occupational health and safety: this component of the guideline has focused on all aspects of safe working environment, starting from setting proper workplace structures and environment, going through provision of proper communication and training at workplace, identifying various physical, chemical, and biological hazards at the workplace, and ending last but not least, with proper usage of PPEs and monitoring. The project implementation will include various hazardous, which in turn would increase risk of health issues and work-related injuries. These hazards include, but not limited to: Injuries due to ergonomic factors, such as repetitive motion, overexertion, and manual handling, injuries by rotating and moving equipment, slipping, tripping, and falling while working in heights, noise and vibration,

inhalation of hazardous materials, electrical shocks by electrical parts, welding/ hot work, eye and skin irritation, and many others.

8. Traffic Safety: this should be promoted by all project personnel during displacement to and from the workplace, and during operation of project equipment on private and public roads. Prevention and control of traffic related injuries and fatalities should include the adoption of safety measures that are protective of project workers and of road users, including those who are most vulnerable to road traffic accidents.

9. Communicable Diseases: this include vector-borne infections, and sexually-transmitted diseases due to labor mobility. However, this control measure is also applicable to combating spread of COVID-19 pandemic through intensive monitoring onsite, and ensuring proper social distancing, all in association with needed awareness and education.

3.3 National Legislation

3.3.1 Human Rights

The 2005 Constitution of Iraq guarantees fundamental rights to Iraqi citizens, men and women, including equality before the law, equal treatment before the law (Article 14); treatment with justice in judicial proceedings (Article 19(6)); participation in public affairs (Article 20); right to work (Article 22); and the preservation of the family, the protection of motherhood, childhood and old age, and the prohibition of child labor and violence in the family (Article 29). The Constitution also guarantees to all Iraqis, "especially women and children," "social and health security," "basic requirements for living a free and decent life," and income and housing (Article 30), as well as health care (Article 31), care for the persons with disabilities (Article 32), and education (Article 34).

3.3.2 Environmental Protection and Improvement

Law No.2 of 2009 aims to protect and improve the environment and natural resources, by preserving public health, biodiversity and cultural and natural heritage, and by encouraging sustainable development and international and regional cooperation. The Law establishes a Council for the protection and improvement of the environment referring to the Ministry of Environment and cooperating with other Ministries. It also defines its duties and responsibilities. Smaller Councils are established in the different provinces of the country. This Law sets forth provisions for the regulation of air pollution and noise reduction; earth protection; biodiversity protection; management of hazardous waste; protection of the environment from pollution resulting from exploration and extraction of oil wealth and natural gas; establishment of an environmental protection fund; rewards; compensation for damages; and penal provisions.

The Law of Environmental Protection and Improvement Board in the Iraqi Kurdistan Region No. 3, 2010. Main provisions of the Law:

- Environmental and public health protection
- Pollution prevention
- Preservation of natural resources and biodiversity
- Encourage environmental awareness

Law of Environmental Protection and Improvement in Iraqi Kurdistan Region No.8, 2008. Main issues:

- Environmental protection of the Kurdistan region
- Prevention of pollution
- Protection of natural resources
- Raising environmental awareness
- Making the environmental policy a part of the developmental planning
- Environmental Impact Assessment requirements
- Environmental inspection and monitoring

The Law for Investment in Kurdistan Region No. 4, 2006 stipulates that any investor has an obligation to safeguard the environment, public health and safety and to comply with the standardization and quality control systems according to the International standards.

3.3.3 Environmental Impact Assessment for Projects

Law no. 27 of 2009 on the Protection and Improvement of the Environment describes an Environmental Impact Assessment (EIA) as: "a study and analysis of the environmental feasibility of proposed projects that may affect the creation or the exercise of their activities on human health and environmental safety of present and future with a view to protecting them." The new law also includes several criteria required in an EIA. According to Article 10, an EIA must include:

- Determination of positive and negative impacts of the project on the environment and the impact of the environment surrounding it;
- The proposed means to prevent and address the causes of pollution in order to achieve compliance with environmental regulations and instructions;
- Contingencies for pollution emergencies and potential precautions;
- Possible alternative technology that is less harmful to the environment and the rational use of resources;
- Provisions to reduce waste, such as the inclusion of recycled or reused materials when possible; and
- An assessment of the environmental feasibility of the project and an estimate of the cost of pollution relative to production.

The procedure for submitting an EIA is set out in Article 11. Before any work is to commence, the EIA must be submitted to the federal Ministry of Environment. Work may not commence until approval from the ministry has been received.

Although Law No. 27 includes an EIA requirement, several gaps have been identified, mainly in the procedural and compliance side:

- There is no screening procedure to determine applicability and level of detail of an EIA; and no requirement for scoping during which issues that should be taken into consideration are identified
- The law does not include a social assessment and there is no requirement for stakeholder consultation, public participation and disclosure
- ESMPs are not usually implemented and if implemented, they are not sufficiently monitored and followed up, in particular during the construction phase.

In the majority of the projects, contractors are not aware of their basic environmental and social roles and responsibilities (occupational health & safety, community safety, impacts due to temporary labor influx, GBV etc.) and tender documents do not usually contain such clauses (i.e. ESMPs).

3.3.4 Land Acquisition

Land Acquisition Law No. 12 of 1981 governs the expropriation of property through acquisition and entitlement for compensation and replacement costs, cancellation of legal rights and other issues of acquisition for the public benefit.

Law on Public Roads No. 35, 2002 in Kurdistan Region provisions for the procedures and practices for the resettlement and acquisition of land and properties during road construction and rehabilitation in Kurdistan Region.

- General Directorate of Roads and Bridges identifies land and properties that are located on the ROW and presents the request for acquisition to the Governor
- The Governor forms a Committee for compensation and acquisition. The Committee has the right to appoint expert(s)
- Public Roads Act No. 35 of 2002 specifies that the authorities have the right to acquisition of 25 % of the area of the land without any compensation to the owner. In case there are crops planted in the same area the state compensates for the value of the crops for the year including the value of the crops planted on the 25 % part that is state acquisition but no compensation is provisioned for the value of the land.
- The Committee for the acquisition and compensation provide assessment of the crops value according to the Ministers Decree No. 360 of 2008 based on specification of the type of crops, their financial value and quantities.

3.3.5 Labor Rights

Law No.37/2015, including Instruction No.12 of 2016 for Occupational Health and Safety, differentiates between jobs depending on the circumstances and duties that the employees are conducting. The Law organizes the relationship between the employer and employees, with the aim of protecting their rights and realizing sustainable improvement based on social justice, equality and providing suitable work for everybody without discrimination. The Law prohibits all types of

compulsory labor and child labor and determines minimum working age (15 years) and to prevent any discrimination or harassment, whether direct or indirect.

The 1987 Labor Law, as amended by the Coalition Provisional Authority Order Number 89, of 2004 sets the minimum age for employment at 15 and the minimum age for hazardous work at 18. Article 9 (2) of the Coalition Provisional Authority Order Number 89 outlines categories of work considered hazardous, including work underground, underwater, in an unhealthy environment or where a child is unreasonably confined to the premises, and where children are required to use dangerous machinery or handle heavy loads. Instruction No. 19 of 1987 includes additional prohibitions on hazardous labor for children, barring children from working with lead or toxic substances, in construction, and at tanneries or in any other place of employment that is hazardous to the health or morals of the child.

Order No. 89 prohibits slavery and similar practices, including forced labor, child trafficking, and illicit activities such as drug trafficking. The Constitution prohibits trafficking of women and children, as well as the sex trade. The Penal Code prohibits the enticement of children under 18 years into prostitution and provides for up to 10 years of imprisonment for violations. Order No. 89 outlaw's child prostitution and child pornography; violations are punishable by imprisonment. In 2012, the Government passed the 2012 anti-trafficking law, which proscribes penalties for both sex and labor trafficking and replaces portions of the labor and penal codes

Despite Iraqi women enjoying equal rights to employment, according to the 2005 Constitution, certain inequitable elements remain within the law that limit women's economic choices. Some laws and their interpretations limit women in working in certain sectors that require hard labor, night-time work, or dangerous tasks. Moreover, Iraqi society still perceives women in their traditional role as housekeepers and child givers, although it seems that a change is occurring among the younger generations: 66 percent of youth compared to 42 percent of the elderly, support women's right to work.

3.3.6 Occupational Health and Safety

Labor Law No.37 of 2015 and Ministerial Instruction No.12 of 2016: Occupational Health and Safety Requirements Regulations are the main legislation for health and safety issues. Law No.37/2015 differentiates between jobs depending on the circumstances and duties that the employees are conducting, bearing in mind that the New Labor Law includes more than 170 Articles, which include a number of new terms and additions. The Law organizes aspects of the relationship between the employer and employees, with the aim of protecting their rights and realizing sustainable improvement which is based on social justice, equality and providing suitable

work for everybody without discrimination. The Law prohibits all types of compulsory labor and child labor and determines minimum working age (15 years) and to prevent any discrimination or harassment, whether direct or indirect. Article 6, chapter 3 of Iraqi Labor Law, states that the minimum age for employment is 15 years old. However, Iraq is also signatory to the 1989 International Convention on the Rights of the Child, which defines everyone under the age of 18 as a child who must have special protection and care.

The Law regulates the work of female employees by granting additional rights to those that existed in the old law. Furthermore, it addresses the work of subcontractors regarding the employees' rights, following the expansion of such work in Iraq without previous regulation. The law also regulates health of employees and stipulates that the National Centre of Occupational Health and Safety is to be in charge of planning and inspecting the implementation of health affairs in a manner that guarantees the safety of employees at work sites from occupational diseases and injuries, and sets out extensive requirements in this regard in order to achieve a healthy work environment.

The main gaps identified are (mainly during implementation):

- Lack of awareness to adhere to safe working measures among employers and workers.
- Contractors do not implement proper and complete occupational health and safety measures in order to reduce construction costs.
- There is limited capacity to monitor health and safety issues in some industrial sites
- Construction activities are usually not inspected for health and safety issues.

Instructions No. 3/1985 Concerning Occupational Safety: Provides for the enforcement of occupational safety provisions at places of work.

- Regulates that all work places are to appoint a person in charge of occupational safety and an occupational safety committee.
- Provides for the appointment and duties of the person responsible for occupational safety and for the occupational safety committee at each workplace.
- Establishes the functions and duties of employers and employees with regard to occupational safety.

Law No. 6 of 1988 concerning the National Commission for Occupational Hygiene and Safety governs the enforcement of occupational health and safety regulations.

- Provides for inspections of places of employment and inspections reports.
- Establishes the duties and responsibilities of employers vis-a-vis occupational health and safety.
- Establishes the functions of safety commissions at places of work.
- Regulates the responsibilities and duties of workers with respect to occupational health and safety.

3.3.7 Pollution prevention

3.3.7.1 Water

Article 3 of Regulation No.2 of 2001 prohibits the discharge or cast of wastes into public water irrespective of the entity (public and private). Entities are prohibited from discharging wastes, unless they obtain an approval to discharge wastes as per the criteria and specifications set out by the Environment Protection and Improvement Directorate (EPID). Article 4 prohibits discharging any pollutant into public waters, while article 5 authorizes the EPID to issue environmental restrictions pertaining to the quality of public water as well as the quality of water discharged into public water, sewage systems, or rainwater.

The regulations define the permissible discharge limits to both natural waters and sewers. Some of the values are presented in the Table below.

Table 5: Effluent Discharge Parameters

Pollutant	Limits for Discharge into Water Bodies	Limits to Discharge into Sewer
Color	N/A	N/A
Temperature	<35°C	45°C
Suspended Solids	60 mg/L	750 mg/L
pH	6 -9.5	6 -9.5
BOD	<40	1000
COD	<100	N/A
Nitrate	50 mg/L	N/A
Phosphate	3 mg/L	N/A
Free Chlorine	Trace	100 mg/L
Lead	0.1 mg/L	0.1 mg/L
Copper	0.2 mg/L	N/A
Mercury	0.005 mg/L	0.001 mg/L
Sulphate	if the ratio of the discharge is to the amount of source water is 1:1000 or less, the sulphate concentration should not exceed 400 mg/L	300 mg/L
Total hydrocarbons & derivatives	For the river with continuous flow, 5mg/L provided the ratio of discharge to source water is 1:500	N/A

3.3.7.2 Air Quality

Clean Air Act No. 1 of 2004 provides the guidelines for prevention and control of air pollution, as well as the applicable national standards of the most common air pollutants.

Table 6: Ambient Air Quality Standard

Pollutant	Iraqi Standard		WHO Standard
	Concentration	Averaging Time	Concentration
CO	10 ppm	8 hours	N/A
	35 ppm	1 hour	N/A
SO_2	0.1 ppm	1 hour	500 $\mu g/m^3$
	0.04 ppm	24 hours	20 $\mu g/m^3$
	0.018 ppm	1 year	N/A
NO_2	0.05 ppm	24 hours	200 $\mu g/m^3$
	0.04 ppm	1 year	40 $\mu g/m^3$
O_3	0.06 ppm	1 hour	100 $\mu g/m^3$
PM_{10}	150 $\mu g/m^3$	24 hours	50 $\mu g/m^3$
$PM_{2.5}$	65 $\mu g/m^3$	24 hours	50 $\mu g/m^3$
	15 $\mu g/m^3$	1 year	15 $\mu g/m^3$
Total Suspended Particles	350 $\mu g/m^3$	24 hours	N/A
	150 $\mu g/m^3$	1 year	N/A
Falling Dust	10 t/km^2/month - residential zone	30 days	N/A
	20 t/km^2/month - industrial zone	30 days	N/A
Hydrocarbons	0.24 ppm	3 hours	N/A
Pb	2 $\mu g/m^3$	24 hours	N/A
	1.5 $\mu g/m^3$	3 months	N/A
	1 $\mu g/m^3$	1 year	N/A
Benzene	0.003 $\mu g/m^3$	1 year	N/A
Dioxin	0.6 pico g/m^3	1 year	N/A

Instruction No. 2, 2011 of KRG provides measures for the protection of the ambient air quality from pollution and sets limits for the pollutant from different industries

3.3.7.3 Noise

Law No. 41 of 2015 on Noise Protection and Control amends previous legislation, regulates methodological issues in noise control, sets limits for exposure times to continuous noise between 80 and 115 dBA, and determines daytime and nighttime standards for outdoor noise exposure. Law 41/2015 includes standards for ambient and occupational noise with correspondent exposure periods. The main gaps identified are:

- Ambient noise monitoring is not consistently conducted, and monitoring data is not available to the public.
- There is no tracking of compliance with occupational noise exposure during the majority of construction activities.
- Selected Noise limits are different from WBG limits.

A brief comparison is presented in the table below.

Table 7: Comparison of National and WBG Noise Limits

	Iraqi Law No. 41 Requirements			WB Requirements		
		Permissible noise intensity decibel			One hour L_{Aeq} (dBA)	
	TYPE OF AREA	DAY 7:00 – 19:00	NIGHT 19:00-07:00	Receptor	Day 07:00–22:00	Night 22:00 - 07:00
	Sensitive areas (Hospitals, clinics, convalescences and residential care homes)	50	40	Residential; Institutional; educational	55	45
	Urban residential areas	60	50	Industrial; commercial	70	70
	Suburban residential areas	55	45			
	Hotels and hostels	55	40			
	Educational institutions (schools, universities, kindergartens etc.)	55	45			
	Industrial areas and public institutions	70	60			
	Commercial and administrative areas and institutions	65	60			
	Private areas (Airport, railway stations, harbors)	70	60			
	Cultural institutions and protected areas	60	50			
	Recreational areas	60	50			
	Residential areas in industrial zones	60	40			

Instruction for the Environment Protection and Improvement Board No. 1, 2011 includes instructions on control of noise levels in Kurdistan Region and sets limits in decibels within different type of activities

3.3.7.4 Hazardous Substances and Wastes

Law No. 27/2009 provides provisions for the handling of hazardous substances and wastes, and stipulates that they should conform to international standards and best practices for the protection of the environment. Instruction No. 3/2015 consists of 5 Articles and aims at organizing the management of hazardous wastes, either by those who produce them, transport or treat them. The producers should determine the types of waste, collect and storage them to be processed, obtain the environmental approval, keep both paper and electronic records on the quantities and types of waste and have transport documents if needed.

3.4 Institutional Framework in the Project Area

General Directorate of Roads and Bridges of Duhok/Directorate of Roads and Bridges of Duhok: Project Owner. Responsibilities include but not limited to: preparation of road infrastructure plans, preparation of design, preparation and issuing tenders for road projects construction, supervision of construction, operating and maintenance of the road infrastructure.

Directorate of Agriculture regulates agricultural research, agriculture, national resources and forestry throughout Duhok Governorate.

Directorate of Water Resources is responsible for the construction, operation and maintenance of water supply and sewage facilities and the water resources management.

Directorate of Environment/Environmental Protection and Improvement Board is the major governmental agency responsible for environmental conservation and protection.

The duties and authorities include but are not limited to:

- Monitoring and verifying environmental elements in coordination with scientific research centers and in accordance to the specifications set by the MOE.
- Inspecting and auditing private and public institutions to ensure compliance with environmental requirements (parameters and specifications).

Ministry of Municipalities and Tourism/Archeological Directorate of Duhok is entrusted with the following responsibilities:

- Develop and implement the archaeological policy of the region with regards to identification, supervision, protection, maintenance, register and restoration of archaeological sites.
- Promote archaeological sites on national and international levels.
- Conduct public awareness about archaeological sites in accordance to prevalent laws and regulations.

Municipalities are responsible for solid and liquid waste management, land use planning within their jurisdiction, licensing of economical and urban activities, construction and maintenance of roads and other infrastructures. It must be mentioned that it is a common practice in Kurdistan Region that a Mayor will act as a "citizen's lawyer" in resolution of issues with the relevant authorities.

Duhok Farmers Union: The not-for-profit cooperative provides free technical assistance and training to farmers. The co-op also facilitates access to low-interest lines of credit to purchase or rent agricultural equipment and supplies — such as seed and fertilizer — and to secure needed farm services at lower costs than the farmers could otherwise find. Also, this co-op negotiates on behalf of farmers with the governmental institutions.

4 Environmental and Social Baseline Conditions

4.1 Physical Environment

4.1.1 Climate

The project is located in the area, which is characterized as sub-humid upland and mountain region with semi-arid Mediterranean climatic conditions. The main annual rainfall ranges between 400 mm and 1 100 mm. The rainy period is November-April. The mean minimum in July is about 22°C. In winter the mean monthly minimum in January is 10°C and the lowest minimum is -11°C.

The prevailing wind direction at the project area is North-West. Wind speed is generally of light to moderate value with wind speeds between 0.74 m/sec at times in November and 1.20 m/sec at other times April to July.

4.1.2 Soils

The area that is characterized as undulating terrain: a transitional area between low plains and the mountainous region in the north and northeast. It consists of beds of gravel, conglomerate and sandstones. Gravel and conglomerate layers alternate with thin layers of reddish loam and clay. The main soil types are:

- Calcic Xerosols
- Gypsum Xerosols

A regional stratigraphic column shows the presence of a thick Jurassic and Cretaceous succession composed of carbonates, shale and anhydrates. At its type locality within Iraqi Kurdistan, the formation is composed of thin-bedded, black bituminous limestone, dolomitic limestone and black papery shale with streaks of thin black chert in the upper part. Top-soil is alkaline, mostly covered by individual or groups of trees or dense forest, where unprotected by natural vegetation the rate of erosion is high and the surface soil is often washed out.

The high content of clay in the top soil is proportional to the increase of dust generation especially during the dry seasons with the decrease of moisture content[3].

The environmentally sensitive receptor is the agricultural lands adjacent to the project area where deposition of dust might result in reduction of soil productivity.

Also, excessive dust generated by construction activities present the safety hazard to road users due to the reduced visibility. The construction workers and communities in the close proximity to

[3] Gherboudj, I., Beegum, S. N., Marticorena, B., and Ghedira, H. (2015), Dust emission parameterization scheme over the MENA region: Sensitivity analysis to soil moisture and soil texture, *J. Geophys. Res. Atmos.*, 120, 10,915– 10,938, doi:10.1002/2015JD023338.

construction activities, such as shop owners and petrol station employees are exposed to the risk of respiratory problems.

4.1.3 Water Resources

The groundwater resources are identified as a shallow aquifer belonging to the Zakho Basin. The Zakho Basin stretches across the border between Iraq and Turkey. In Iraq, the Zakho Basin has a catchment area of about 1,107 km^2. In the early 1980s an estimated total of 24.3 MCM of good-quality (<700 mg/L TDS) water had been abstracted (9.5 MCM from deep wells and 12.3 MCM as spring discharge).

Figure 7: Map of Zakho Basin[4]

The upper, dominant water-bearing formations in the Iraqi part of the Zakho Basin are made up of Quaternary deposits and Neogene clastics formations of the Bai Hassan and Mukdadia Formations and to a lesser extent of Upper and Lower Fars (Injana and Fatha) Formations. They form an unconfined aquifer system with a collective flow type centered on the Khabour River. In Iraq, the Zakho Basin has a catchment area of about 1,107 km^2. Within the catchment, it is assumed that

[4] Source: Compiled by ESCWA-BGR based on Aghanabati, 1993; Stevanovic and Markovic, 2004

31% of the average annual rainfall (707 mm) infiltrates into the ground but only 23% reaches the aquifer systems. A total of 188 MCM/yr of water (160 MCM/yr in the inter-granular aquifer system and 28 MCM/yr in the fissured-karstic aquifer system) enters the basin as renewable resources. A considerable amount of the recharged volume is discharged through springs, especially those issuing from the fissured-karstic aquifer.

The depth to groundwater in the area varies between 20-30 m as shown in the map below. The wells in close proximity to the project are reported to have the depth up to 170-180m with the yield ranging from 20 to 150 m^3/min.

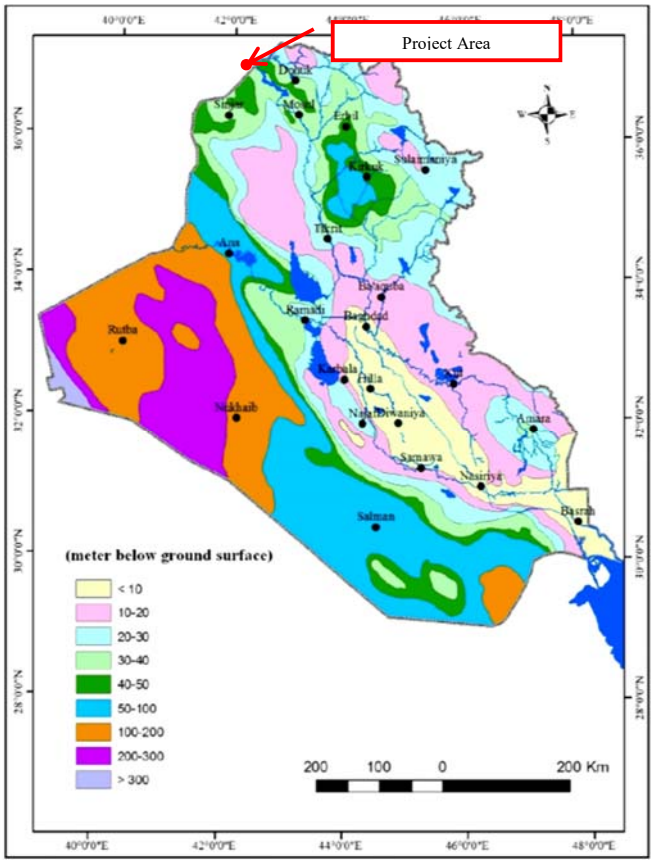

Figure 8: Hydrological Map of Iraq[5]

Surface water resources comprise seasonal runoff valleys. Generally, all the seasonal streams drain towards the Tigris River. The drainage area is characterized as undeveloped cultivated land with

[5] Al-Jiburi, H.K. and Al-Basrawi, N.H. (2015). Hydrogeological map of Iraq, scale 1: 1000 000, 2nd edition. Iraqi Bulletin of Geology and Mining, Vol.11, No.1, p. 17-26.

the catchment slopes ranging from 0.09 to 0.15 %. The catchment area is estimated as ranging from 1, 7 to 2.1 km^2. The peak runoff for 25-year period is evaluated as approximately 1.8 - 4.3 m^3/sec.

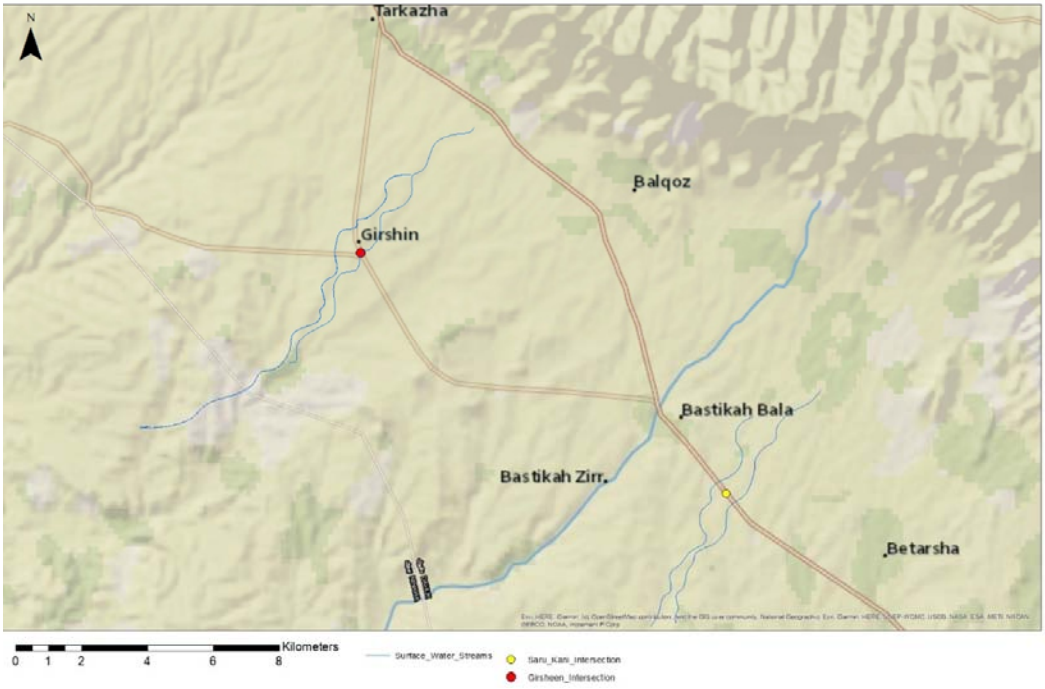

Figure 9: Seasonal Streams in the Vicinity of the Proposed Overpasses

4.1.4 Ambient Air Quality

The main sources of the air pollution in the area:

- Dust generated by agricultural activities
- Emissions of vehicles on the Duhok-Zakho Road

At present, no air quality testing has been done in the project area.

It must be noted, that the environmentally sensitive receptors are the cultivated lands, where the cumulative impact of the dust generated by the construction activities and emissions from machinery and equipment could have a detrimental impact on cultivated lands due to deposit of contaminants.

Another environmentally sensitive receptor is the road users, where the excessive amounts of dust can impair the visibility on the road, thus creating the safety hazard.

Also, the construction crew and employees of the nearby businesses present another environmentally sensitive receptor.

4.1.5 Noise and Vibration

The main source of noise and vibration in the project area is the traffic on the Duhok-Zakho Road, which is the main route for transporting vehicles from Turkish-Iraqi border.

The environmentally sensitive receptor is the employees of the businesses located in close proximity to the project area.

4.1.6 Seismology

The project is located in the area which is defined as the Minor Damage Zone (Zone 2-5 on the Map below) with the seismic activity of IV-V MM.

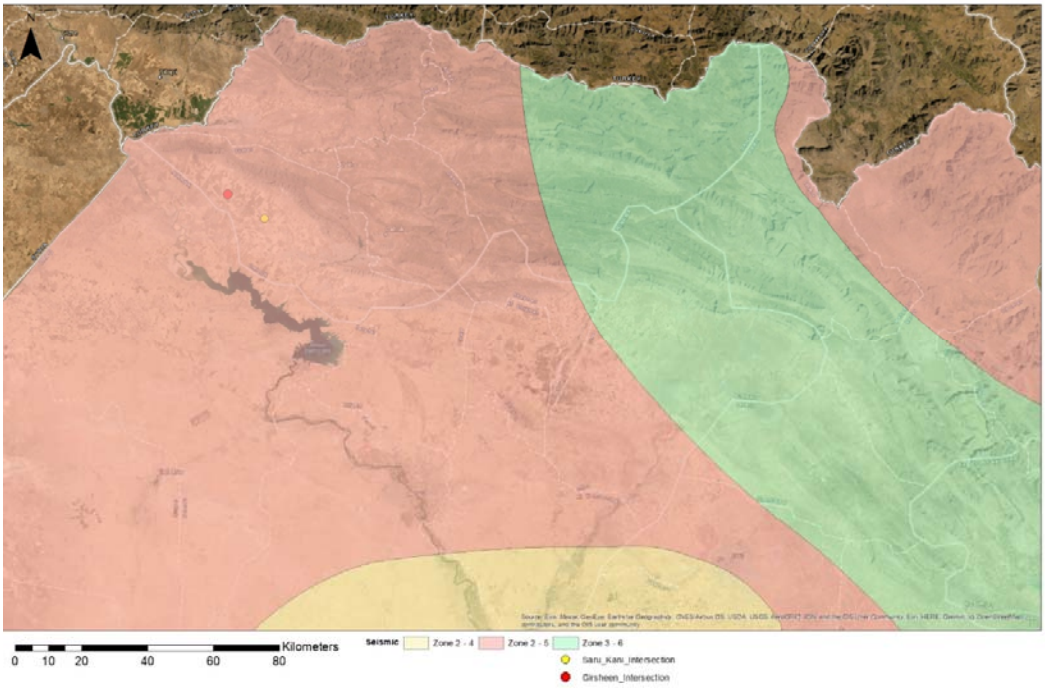

Figure 10: Seismic Map of the Project Area[6]

There might be damage to structures due to the seismic activities. However, during the last year no earthquakes were recorded in the area of the project[7].

4.2 Biological Environment

The area has been subjected to diverse human induced impacts over the millennia such as rain-fed cultivation. Therefore, natural habitats have suffered the significant level of degradation over the

[6] Adapted from: Alsinawi, S.A. (2001) .Seismological Considerations of the Eastern Arab Region. Proceedings of the Euro-Mediterranean Seminar on Natural, Environmental and Technological Disasters, Algers, Algeria

[7] https://earthquaketrack.com/p/iraq/recent (11/13/2020, 7:00pm)

past several hundred years. The terrestrial ecosystem is characterized as Middle East Steppe ecosystem.

Vegetation reflects the Mesopotamian province of the Irano-Turanian eco-region and is characterized by the dominance of the drought-tolerant low shrubs with a variety of grasses and legumes.

Table 8: List of Identified Plants

Common Name	Scientific Name	Conservation Status
Spanish Flag	*Lantana camara*	LC
Clary Sage	*Salvia verbenaca*	LC
Nettleaf Sage	*Salvia urticifolia*	LC
Sagebrush and muqwort spp.	*Artemisia spp.*	LC
Sword Lilly	*Gladiolus palustris*	LC
Anemone	*Anemone coronaria*	LC
Field Bindweed	*Convolvulus arvensis*	LC
Asphodel	*Asphodelus albus*	LC
Star of Bethlehem	*Ornithogalum umbellatum*	LC
Persian oak	*Quercus brantii*	LC
Thistle spp.	*Carduus, Cirsium, and Onopordum*	LC

*LC - Least Concern

The area of the project is located in a general area identified as a fly-way route for migratory birds from Eastern Europe and West Siberia to Mesopotamia and Africa.

Table 9: List of Identified Birds

#	Common Name	Scientific Name	Conservation Status	Presence
1	Common Kestrel	*Falco tinnunculus*	LC	Resident
2	Common Quail	*Coturnix coturnix*	LC	Resident
3	Crested Lark	*Galerida cristata*	LC	Resident
4	Hoopoe	*Upupa epops*	LC	Resident
5	Alpine Swift	*Tachymarptis melba*	LC	Passerine
6	Yellow Wagtail	*Motacilla flava*	LC	Resident
7	Osprey	*Pandion haliaetus*	LC	Resident
8	Stock Dove	*Columba oenas*	LC	Resident
9	Tawny Pipit	*Anthus campestris*	LC	Passerine
10	Meadow Pipit	*Anthus pratensis*	LC	Passerine

#	Common Name	Scientific Name	Conservation Status	Presence
11	Alpine Accentor	*Prunella collaris*	LC	Passerine
12	Eurasian Wren	*Troglodytes troglodytes*	LC	Passerine
13	Lesser Whitethroat	*Sylvia curruca*	LC	Passerine
14	Asian Stonechat	*Saxicola maurus*	LC	Passerine
15	Common Magpie	*Pica pica*	LC	Resident

*LC – Least Concern

The project area does not contain any globally important habitats or ecosystems. There are no Nature Reserves or other legally protected areas in the vicinity of the project or in a close proximity.

No biological receptors are expected to be impacted by the construction of overpasses.

4.3 Social Settings

The total population of Duhok Governorate is about 1,200,000 residents. However, due to the political situation in the region the area witnessed the influx of refugees and IDPs, currently numbering over 1,300,000 people.

The governorate of Dohuk is part of the Kurdistan Region of Iraq (KRI) and is made up by the districts of Dohuk, Amedi, Sumel and Zakho. Kurds are the dominant ethnic group, with small minorities of Turkmen and Arabs living across the governorate.

Table 10: Population Characteristics

	Population under the poverty line	Unemployment	Enrollment primary education	Enrollment secondary education	Literacy
Dohuk Governorate	4,9%	8,8%	94,7%	65,7%	69,3%
National Averages	11,5%	11,3%	90,4%	48,6%	79%

Despite being one of the governorates with the lowest poverty numbers, Dohuk governorate scores below average on a number of other development indicators. Notwithstanding the higher than average enrollment rates in primary and secondary schools, illiteracy remains a serious problem in the governorate. The number of people living below the poverty line of $2,5 a day also varies between the districts: 2011 data indicate that12,5% of the population was living under the poverty line in Al-Shikan district, dropping to 0% for the district of Dohuk. The number of people with access to an improved water source (96,2%) or improved sanitation facilities (97,3%) are both above the national average, but the public electricity network fails to deliver a

consistent source of power to the governorate's inhabitants. Limited transport options and financial means hamper access to health facilities.

4.3.1 Features in Project Site:

The Project area, where two overpasses are to be constructed, includes inhabitants of nearby villages, businesses located adjacent to the ROW, as well as farming lands. These are going to be key receptors of the proposed project's impacts.

1. Overpass near Sari Kani:

Table 11: Nearby Receptors to the Sari Kani Overpass

Village	Location	Distance from the overpass project (km)	Estimated population
Shiur	South-east	2.6	1,000
Saru Kani (Sari Kani)	South	2.9	2,000
Gresh	North-east	1.4	500
Sartank	North-west	2.0	1,500
Other features close to project location: Duhok airport (not operational), Duhok power station, industrial zone, and small businesses along the road such as restaurants, as well as extended agricultural and farming lands.			

Source: google maps

2. Overpass near Girsheen:

Table 12: Nearby Receptors to the Girsheen Overpass

Village	Location	Distance from the overpass project (km)	Estimated population
Gir Usman	South-east	1.8	500
Baward	South-west	3.0	1,800
Kurchina	West	3.7	1,500
Other features close to project location: industrial facilities, small businesses along the road such as restaurants, as well as extended agricultural and farming lands and greenhouses			

Source: google maps

5 Anticipated Impacts

5.1 Beneficial Project Impacts

During the project's implementation phase, the following benefits are expected:

Provision of the direct job opportunities for skilled and semi-skilled workers: the project is expected to provide 55 of workers needed at specific time during construction phase, including but not limited to: project component, nature of work required, and time plan. According to the information from previous projects, the daily average number of workers during the peak time will be about 100 US $. They are equipment drivers, auto drivers and rolling drivers, blacksmiths, carpenters, electricians, mechanics, engineers, measurements technicians and others. The local community could theoretically provide a proportion of this temporary labor force dependent on skills needed and the strategies of the individual contractors in sourcing their workforce.

Provision of indirect job opportunities: Economic activity in the project area might be increased through the following supply chain:

- Implementation of works and provision of supplies related to construction, operation and closure of the site and ancillary facilities
- Provision of transportation, freight, and storage services to the project
- Drivers and mini-bus owners will benefit from the transportation of the workers
- Provision of food supplies, catering, and cleaning services
- Provision of construction & auxiliary materials, accessories, engineering, installation, and spare parts
- It is recommended to provide women with work opportunities whenever possible.

After the project implementation, the following positive impacts are expected:

- Improved access to markets, health centers and schools in these areas.
- Improved quality of traveling
- Improved safety, due to improved road condition
- Increased economic activities stemming from the development of businesses and commerce movement.
- Access to information services and remote villages.
- Reducing travelling time which might result in reducing gas expenses.
- Sustainable poverty reduction and local economic and social development.

5.2 Adverse Project Impacts during Construction Phase

The assessment of the potential adverse impacts on different environmental parameters during the construction phase is presented below. M is the magnitude in the sense of degree, extensiveness, or scale. S is the significance of the proposed actions on the specific environmental characteristics

and conditions. Magnitude and significance are presented on scale from 1 to 10, 1 being the least and 10 being the highest.

Table 13: Impacts Significance Evaluation Matrix – Construction Phase

Receptor	Construction Activities																	Impact Severity
	Scale	Cleaning	Assembly work	Excavation	Foundation construction	Columns construction	Girders installation	Deck erection	Waste Disposal	Construction Camp	Paving	Machinery & Transportation	Crack Cleaning	Guardrails installation	Electric cables installation	Lighting poles installation	Signage installation	
Soil	M	2		2	3	3			3	3	2	2	2	1	1	1	1	Minor
	S	1		1	2	2			2	3	1	1	1	1	1	1	1	
Water Resources	M	3							3	4	2	2	2					Minor
	S	1							2	2	1	1	1					
Air	M	4	2	4	4	4	4	4	4	2	4	4	4	1	1	1	1	Moderate
	S	3	1	3	3	3	3	3	3	1	3	3	3	1	1	1	1	
Noise & Vibration	M	5	5	5	5	4	4	4	4	3	4	4	4	5	5	5	5	Moderate
	S	4	4	4	4	3	3	3	3	2	3	3	3	4	4	4	4	
Biodiversity	M	1							1	1	1	1	1					Negligible
	S	1							1	1	1	1	1					
Public Health & Safety	M	5	5	5	5	5	5	5	5	4	5	7	3					Moderate
	S	2	2	2	2	2	2	2	2	1	3	2	2					
Occupational Health and Safety	M	5	5	5	5	5	5	6	4	3	6	7	3	5	5	5	5	Moderate
	S	3	3	3	3	3	3	4	3	2	5	6	2	4	4	4	4	

Receptor	Construction Activities																	Impact Severity
	Scale	Cleaning	Assembly work	Excavation	Foundation construction	Columns construction	Girders installation	Deck erection	Waste Disposal	Construction Camp	Paving	Machinery & Transportation	Crack Cleaning	Guardrails installation	Electric cables installation	Lighting poles installation	Signage installation	
Social Settings	2	2	2	2	2	2			2	2	2	4						Minor
	1	1	1	1	1	1			1	1	1	2						

The impacts of the construction phase are expected to be minor to moderate. Below is the description of the anticipated adverse impacts.

5.2.1 Impacts on Soil

The main potential adverse impacts on soil are:

- Soil erosion due to the excavation activities and leaving open excavated areas during rain events or in the vicinity of existing watercourses.
- Land contamination: due to the inadequate disposal of the effluent, solid waste, and construction debris, leakage of fuel and oil from the equipment; Accidental spillage of fuel and lubricants during transportation of the construction materials.

The impacts are expected to be minor.

5.2.2 Impacts on Water Resources

During construction phase, water will be needed for domestic and potable use of the staff (estimated at 60 l/d per worker), for soil watering and spraying to suppress dust and to clean the equipment and the work site offices. The water supply requirements will be provided by trucks through licensed service provider from sustainable water source. The source of this water is via the local water network in locations identified by the municipality. Normally, the same source of water is used for spraying and equipment cleaning. Drinking water is provided as bottled water. Other potential impacts on water resources may be due to the following:

- Alteration of water flow and drainage due to debris disposal in unauthorized areas blocking the natural drainage patterns and existing culverts.
- Contamination of surface water: spillages of chemicals and hydrocarbon products; removal of debris from the water channel; disposal of the raw sewage from the construction camp directly into the water courses; disposal of generated solid waste from the construction camp and construction debris on ad hoc basis as is also the common practice in the area. Surface water contamination can be the source of groundwater contamination due to leaching of contaminants into the soil and eventually infiltrating into the aquifer.
- Contamination of groundwater through the leachate from improperly disposed construction debris and materials containing hazardous matter. Improper wastewater disposal, such as from construction camp facilities, on soils may also percolate to groundwater causing contamination of subsurface/groundwater table
- Contaminated wastewater by engine oils or lubricant after washing of equipment or by accidental spills may percolate to the soil thus polluting the ground waters and affecting its ecosystem. Due to the underlying rock structure mostly comprising of lime stone, the impact is considered minor due to the potential filtration of effluent before reaching the groundwater levels.
- Run-off: during rainy events, stormwater is expected to carry sediments and other hazardous substances from the construction site, if construction materials and aggregate

stockpiles are not managed properly. This would result in land contamination and pollution to immediate physical and biological surroundings.

The overall impact related to water resources is considered minor.

5.2.3 Impacts on Air Quality

The main sources of air pollution are:

- Cleaning activities raising dust such as debris removal;
- Increased dust levels due to excavation and transportation activities, especially transport of the debris in open vehicles; The dust and particulate matters may occur also from accumulated piles of stored inert waste material (stockpiles of ground asphalt, rubble, gravel, and also sand) at/ or near the site prior to their removal for disposal.
- Air pollutants typically associated with the combustion of fossil fuels, such as nitrogen oxides (NOx), sulfur dioxide (SO2), carbon monoxide (CO), and particulate matter (PM), volatile organic compounds (VOCs) and metals that may also be associated with emissions from vehicles, equipment, and materials.

The impact is considered moderate.

5.2.4 Noise and Vibration Impacts

The main sources of noise during construction phase are the noises produced by the operation of the construction machinery.

The noise emission levels are expected to exceed the EHS Guidelines for noise levels (presented in the Table below) and the noise impact is considered as moderate and poses a significant health risk to the workers using the equipment.

Table 14: Noise Emission Levels dB (A) and Distance to the Equipment

Type	Distance between Equipment and Recipient		
	5m	20m	50m
Loader	90	78	70
Grader	90	78	70
Vibration Roller	86	74	66
Bulldozer	86	74	66
Sprayer	87	75	67
Generator	98	86	78
Impact drill	87	75	67
Impact piling	112	100	92
Concrete mixer	91	79	71
Concrete pump	85	70	62
Pneumatic hammer	84	86	78

However, the noise will not be continuous and no noisy activities will be allowed to take place at night to prevent any inconvenience for the nearest community. As for on-site workers, the personal protective equipment should be used in order to reduce the impact of the noise and for the all period of work

The overall noise impact is considered to be of moderate significance.

The construction equipment inevitably produces vibration, and in some cases the vibration can be quite severe posing the health risk to the personnel handling the equipment. The impact of vibration is considered moderate.

5.2.5 Community Health and Safety

During construction, the Contractor is expected to establish detours and diversions, in coordination with concerned authorities. However, risk of traffic accidents is expected on road users, as well as pedestrians of the nearby localities. In addition to traffic accidents, public safety would be at risk if transportation from and to the construction site, as well as unauthorized access to construction site are not controlled.

The risk to public safety is considered moderate. Areas of most danger to public include:

- Where heavy equipment is moving in and out of construction area
- The sites of loading of the debris
- At storage areas for construction materials, fuel and surplus spoil.
- At unprotected unmarked excavation areas
- Increased risk of road accidents due to detours and diversions
- Impacts on community Health and Safety are expected to result from emissions of gaseous pollutants and dust, increased background noise levels, uncontrolled dumping of construction waste, accidental falls in temporary excavated trenches, accidents from vehicles, etc.
- Waste accumulation in illegal dumping and potential burning of construction waste
- Probability of diseases transmission to community from workers including Hepatitis C, B and COVID 19

5.2.6 Occupational Health and Safety

All construction sites are inherently unsafe. The substantial risks to public safety as discussed above are limited by occasional and casual acquaintance the public will generally have with the proposed construction activity. For those employed on the project the risks are more varied and omnipresent. The impacts are considered moderate. These are:

- Inhaling of hazardous substances and extended exposure to dust

- Risks of falling while working at heights
- Health risk due to the extended exposure to noise and vibration
- Accidents involving construction vehicles and equipment;
- Physical hazards from maintenance work and waste
- Fire Hazard
- Slippage and Falling
- Manual handling and lifting
- Electrocution
- Contact with live power lines
- Heat exhaustion
- Increased risk of spread of communicable diseases in general and in specific COVID-19
- Undiscovered UXO/ERW may present additional risks to public and to employees therefore the extreme caution should be exercised while moving the debris despitethe fact that the area have received clearance from the armed forces.

However, the risks to workers on construction sites are well understood and documented and providing normal, internationally accepted Health and Safety procedures are followed, they can be minimized.

5.2.7 Waste Management

During construction phase the main sources of liquid waste generation are:

- Sewage from construction camp facilities
- Wastewater resulting from some construction activities containing high suspended solids
- Oil residues and industrial fluids from washing of equipment and vehicles
- Waste oil, grease and de-greasing solvents from vehicle and equipment servicing.

The main sources of solid waste are:

- Paper, discarded packaging and crates, redundant plant, used tires and broken or failed concrete products
- Construction debris such as removed fragments of the destroyed bridge section
- Residential containing organic waste from construction camps
- The main impact of the inadequate waste disposal is potential contamination of soil and surface water resources, eventually infiltrating to groundwater resources.

5.2.8 Construction Camp Impacts

The construction camp has a number of facilities that if not adequately managed might potentially be detrimental to the environment. The impacts of the construction camp are considered as moderate and limited in magnitude and duration. The construction camp activities which can cause an impact are:

- Housing of construction crew and canteen (minimal in this project)
- Storage of construction materials

- Parking lot and maintenance area for the construction machinery and equipment
- Septic tank for the housing and canteen and disposal of effluent
- Accidental spillage of hazardous materials
- Accumulation of discarded and excessive materials
- Accumulation of construction debris and residential solid waste

Since the project envisions employment of nationals and preferably from local population the impact of the labor influx is very minor. The number of people to be employed on the site from the local community is expected to be 28 persons, and the technical staff to be employed will be the mix of national experts and local experts. The impact on the community is anticipated to be very minor since the technical personnel employed not from the local community is expected to stay at the site only during the working hours.

See Annex 3 for "Environmental Requirements for Contractors" and "Environmental and Social Liabilities of CTP Contractors" for more details.

5.2.9 Impacts on Social Settings

The project will not include extensive excavation in undisturbed areas and only for the replacement of the existing communications; therefore, the impact on topography is considered minor.

- The project does not require temporary nor permanent land acquisition. Lands of labor camp will be located inside the construction site that is owned by GDRB.
- Storage of equipment and construction materials. The contractor will lease lands in order to store the construction materials
- Temporary site storage areas in the roads. The contractor will rent site storage areas in order to store the equipment and excavation tools, in addition, temporary equipment for workers' services. As well as, the contractor will coordinate with the district in order to provision sanitation and potable water services.

The temporary impacts on traffic during the period of construction will be primarily of two types in the intersections connecting the entrances to the overpass and the road leading to the alternative route, especially during the movement of the vehicles transporting debris and construction activities. The impact is considered minor.

During the project implementation there is a possibility of escalated concerns/complaints not managed properly from the community as well as the project's different types of workers.

The social impacts include:

Child labor: According to Iraqi National Labor Law No.12/2015, child labor should be prohibited especially in dangerous works. This risk should be carefully handled in the ESMP and strict obligations and monitoring should be applied in the contractor obligations. The risk is considered minor.

Temporary Labor Influx: The implementing contractors rely on using a number of workers and technicians during construction works, about 80 workers are expected to be present in the project site. They might work in parallel or in sequence. The number of workers varies according to the size of the work in each construction stage. Temporary workers may have impacts on the project area in terms of:

- Risk of social conflict: There are no potential effects of temporary labor influx on the culture of the society in the project areas; this is due to the focus of the implementing companies on the labor, whom are often from areas adjacent to the project areas.
- Increased risk of illicit behavior and crime: the implementation companies and the contractors should revise the criminal records of the workers, in order to avoid the risk of illicit behavior and crime in the project areas.
- Increased risk of communicable diseases and burden on local health services: the implementation companies should take care of the workers' health in order to avoid the spread of communicable diseases, including COVID19.

Given the limited number of workers (80 workers) and being from the same rural communities. The impact related to labor influx tends to be minor.

Gender Based Violence (GBV): The presence of workers in the project sites might entail various forms of gender-based violence (GBV). They are as follows:

- Harassment of women and young girls by workers, this might lead to honor crimes
- The probability of limitation of women and young girls' mobility in the project sites,
- Discrimination against women in terms of employment.

The project will be implemented in rural area that has experienced pre-existing social conflict (particularly at the time when ISIS was in the area). However, the security situation in the area is now considered to be stable. Additionally, workers are mainly recruited from the project area of influence and they follow the same norms and traditions. Therefore, will all these factors taken into consideration the risk of GBV would be classified to be of minor significance.

5.3 Anticipated Adverse Impacts during Operational Phase

Following the maintenance work and during the project operation phase, it is expected that the the traffic volume may also increase due to the improved conditions of the road network. This might cause potential risks related to community safety (traffic accidents).

The main impacts during operational phase are:

Soil: minor impacts during the regular maintenance activities during the maintenance paving and scheduled structural repairs that might involve resurfacing of the pavement and localized excavation. Accumulated debris and accidental spills could potentially cause the soil contamination. The impact is considered minor.

Water resources: Accidental dumping of the debris during the resurfacing prior to paving and scheduled structural repairs might cause diversion of the water flow and creation of the shallow areas and localized ponds. The impact is minor.

Air quality: Environmental effects of the vehicle emissions include acidification of soil and surface waters, adverse effects on crops and animal species, and damage to buildings and structures. During the operational phase the main impacts on the ambient air quality are expected to be from the traffic emissions using the road.

Noise and Vibration: Noise is considered as a minor impact during operational phase.

Vibration due to traffic takes the form of a low frequency disturbance that produces physical movement in buildings and their occupants that can be transmitted through the air or the ground. Ground born vibration produced by interaction between wheels and the road surface is typically of lower frequency, 8 – 20 Hz. Poor road condition is the prime factor in determining the susceptibility of buildings to traffic vibration which will not apply to the newly overpasses

Land use impacts are considered very minor and are related to inadequate waste management.

Road accidents: although the new overpasses would enhance vehicle movement and provide more safety measures for road users, still accidents are expected due to over speeding. This risk applies to both road users and pedestrians. With setting speed limits, adequate signage, and ensuring proper patrolling, these impacts should be minor.

The increase of traffic accidents due to the increased speed is expected to be very minor, since the road is equipped with the speed control road signs and stationary speed control equipment.

Utilities and Infrastructure: the facilities are using their own sources of power, and therefore no impacts are anticipated on the electric grid in the area.

Socio-Economic impacts: During the operational period, the project is expected to result in positive socio-economic outcomes for the local communities. However, the GRM will be kept operational for one year after completion of works and will help address the complaints of the local community through an accessible, fair and transparent means of reporting any emerging adverse impacts, and a means of obtaining mitigation

5.4 Indirect, Cumulative, and Residual Impacts

Indirect impacts are considered to be minor due to the limited duration of the construction activities. Nevertheless, inadequate waste management and accidental spills of hazardous materials could potentially have an impact on the groundwater quality. The impact is exacerbated by inadequate waste management practices in the project area.

The main cumulative impact anticipated through implementation of this project is the incremental effect on of construction waste disposal on the waste management in the area already suffering from the lack of disposal facilities.

The other cumulative impact is the increase of the traffic flow at the existing diversion routes.

Residual or irreversible impacts are considered to be very minor and mostly concern the use of the construction debris dumping sites as permanent municipal waste disposal areas. Another residual impact will be the increased level of noise due to traffic movement.

6 Environmental and Social Management Plan

In order to manage the Environmental & Social impacts in line with KRG policies, and policies of funding agencies for the project, an Environmental and Social Management Plan (ESMP) has been prepared. The ESMP contains management measures avoidance, mitigation, as well as enhancements that would be implemented during the construction and operation/maintenance phase of the project. ESMP also defines the monitoring parameters, frequency of monitoring and monitoring responsibility, as well as cost estimate of mitigation measures and monitoring where applicable.

It covers the measures on and near the highway right-of-way and also in the construction-related sites such as camps, asphalt mixing plants, equipment workshops, etc.

The Environmental and Social Management plan matrices are prepared for the proposed project during construction and operation /maintenance phases. The main element of ESMP is the cost of implementation which shall be integrated into the contactor's cost.

Table 15: ESMP during Construction Phase

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
1	Air quality	Vehicle emissions ▪ Contractor to keep vehicles and machinery properly operated and maintained. ▪ Contractor to minimize unnecessary vehicle idling. ▪ Switch off any engine as soon as it is not used. Dust ▪ Minimize dust from materials (such as sand, cement) and construction activities (such as excavation) by using covers, storage, control equipment, and increasing moisture content. ▪ Prepare concrete before going to the site to avoid movement of materials (gravel, sand, cement) if possible ▪ Minimize dust from vehicle movements, using water sprays or appropriate. ▪ Avoid the burning of materials on site. ▪ Switch off any engine as soon as it is not used. Hazardous Emissions ▪ Avoid storage of hazardous materials in open areas without proper covering; ▪ Provide adequate ventilation for work areas	Contractor	Resident Engineer PMT	The bidders will be able to include these costs in their bidding. Additional cost for air quality testing to establish the baseline to be conducted by the third party: 1500 US $
2	Noise	Noise and vibration management ▪ Avoid or minimize transport through community areas. ▪ Switch off any engine as soon as it is not used. ▪ Working at night is prohibited. ▪ Contractor to minimize unnecessary vehicle idling ▪ Muffling of the equipment; ▪ Additional health check-ups for personnel handling the vibrating and noisy equipment	Contractor	Resident Engineer PMT	Additional cost for medical check ups 2000 US $

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
3	Water resources	Water run-off management (drainage plan) ▪ In the event that sediment is transported onto the road it should be cleaned using a street sweeper or by physically sweeping the street in cases of small areas to ensure the sediment is not washed into the drainage system with water runoff. ▪ Raw materials used in construction, which can be carried by water runoff, must be located and stored away from paths for water runoff. ▪ Road curb inlets must be checked and cleaned to ensure the water runoff is flowing into the drainage system. ▪ Where possible or appropriate, schedule works to avoid heavy rainfall periods (i.e. during the dry season) and modify activities during extreme rainfall and high winds. ▪ Carry out any activities that could cause pollution in designated areas ▪ Use topsoil to fill up potential pools to avoid stagnant water ▪ If surface drainage is disturbing the construction process, utilizing ditches, dikes and/or sandbags to divert this drainage from entering excavations	Contractor	Resident Engineer PMT	Hydrogeological Investigation: 500 US $
4	Soil	Soil management ▪ Excavated soil (and/or topsoil) is appropriately stored, and reused for back filling in holes or trenches whenever possible. ▪ Marking excavation with physical boundaries (barriers, tape or fence) ▪ Preventing loose material (soil and equipment) from falling or rolling into the excavation by removing this material to a minimum of 0.5 metre from the edge of the excavation	Contractor	Resident Engineer PMT	Delineation of excavated areas: 300 US $; Emergency soil testing in case of accidental spills: 1000 US $

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
		▪ Disposal of contaminated soil by truck to nearest authorized dumping areas. ▪ Use topsoil to fill up potential pools to avoid stagnant water ▪ If surface drainage is disturbing the construction process, utilizing ditches, dikes and/or sandbags to divert this drainage from entering excavations. Adverse weather Site engineer is to monitor weather on a daily basis. No construction activities to be undertaken in strong winds or rains.			
5	Construction Camp	• Location of the camp should be agreed with the local beneficiaries • Location of the camp outside known aquifer recharge zones • Provision of adequate infrastructure for effluent collection; • Timely disposal of effluent • Timely disposal of solid waste • Provision of collection pits for collection of used machinery oils; • Adequate vehicle maintenance • Transporting wastes to the designated disposal sites	Contractor	Resident Engineer PMT	No additional costs
6	Waste Management	<u>General</u>: ▪ Keeping the site clean and tidy: a. Ensure there is no loose materials or debris lying around the site including the perimeter; and b. Vehicles are regularly checked for cleanliness (general aspect and making sure no leaks are occurring) ▪ Burning of waste is prohibited ▪ Reducing construction waste related to on-site construction and off-site manufacture or fabrication. ▪ Reusing the material on site (in situ or for new applications) whenever it is possible	Contractor	Resident Engineer PMT	Additional costs for disposal of hazardous materials: 3000 US $

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
		▪ Monitoring the amount of site construction waste created to make sure it does not affect the surrounding and the adjacent areas. - Waste is not blocking pathways - Construction waste will be gathered in a specific zone of the construction site ▪ Contractor to evacuate any construction waste that are not possible to reuse, by truck to nearest authorized dumping site pre-agreed with the local authorities and distanced from the environmentally sensitive receptors and on a regular basis to avoid accumulation; ▪ All used motor oil, lubricants, etc. are to be collected in closed bins to avoid leakage and transferred to the refinery for processing ▪ All staff will avoid littering in the open. Workers to use bins to throw garbage. <u>Hazardous materials</u>: ▪ Provide adequate secondary containment for fuel storage tanks and for the temporary storage of other fluids such as lubricating oils and hydraulic fluids. ▪ Use impervious surfaces for refuelling areas and other fluid transfer areas. ▪ Provide portable spill containment and clean-up equipment on site, and train staff in the safe use of it. ▪ Provide adequate sanitation facilities serving all workers (mentioned in HSE). ▪ Paints with toxic ingredients or solvents or lead-based paints will not be used			

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
7	Public Health and Safety	▪ Set up warning signs in the workplace: o All safe footpaths are marked; construction materials are not blocking pathways o Site entrances and exits are clearly marked for visitors and delivery drivers to see; and o If present, site reception is clearly signposted OR all visitors are escorted to the reception. ▪ Providing separate traffic routes for pedestrians and vehicles, where possible ▪ Guiding traffic into a single lane and meeting traffic needs to be regulated only allowing traffic to pass in one direction at the time. The most common method of regulating traffic on rural roads is to employ flagmen with stop/go signs at both ends of the diversion when the route diversion is initiated. For longer duration the signs of diversion should be installed equipped with lighting for night hours. ▪ Designating specific parking areas for workers' and visitors' vehicles outside the construction area. ▪ Avoid or minimize transport through community areas. ▪ In compliance with national regulations the Contractor will ensure that the construction site is properly secured and construction related traffic regulated. ▪ The site will be clearly visible and the public warned of all potential hazards by signposting and barriers / fencing ▪ Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for pedestrians where construction traffic interferes. ▪ Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement	Contractor	Resident Engineer PMT	Additional costs for marking and signage: 300 US $

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
		▪ If required, active traffic management by trained and visible staff at the site for safe passage for the public ▪ Ensuring safe and continuous access to all adjacent office facilities, shops and residences during construction			
8	Occupational Health and Safety	▪ There is posted material indicating the nearest police station and hospital (with accident and emergency facilities). ▪ The contractor must take reasonable steps to prevent unauthorized people accessing the site. ▪ Training on handling of UXO/ERW ▪ Avoid the burning of materials on site. ▪ Provide a first aid kits in different places of the work site with the appropriate number of materials given the number of workers on site. The locations of the first aid kits will be provided to all workers. ▪ Providing extinguishers on work site. ▪ If work involving the use of flammable materials is being carried out, stop people smoking and do not allow other work activities involving potential ignition sources to take place nearby. ▪ Providing site boundaries by installing suitable physical boundaries (barriers, tape or fence). ▪ Marking excavation holes with physical boundaries (barriers, tape or fence) ▪ The contractor should put up barriers or covers in the area of openings and excavations. ▪ Store building materials (such as pipes, manhole rings, and cement bags) so that they cannot topple or roll over. ▪ Keep walkways and stairways free of tripping hazards such as trailing cables, building materials, and debris. ▪ Everyone who works on any site must have access to adequate toilet and washing facilities, a place for preparing	Contractor	Resident Engineer PMT	No additional costs; the cost is imbedded in mandatory HSE measures

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
		and consuming refreshments, and an area for storing and drying clothing and personal protective equipment (PPE). ▪ Contractor to ensure PPE (personal protective equipment) is used by all workers on site. ▪ Materials and equipment are tidily stacked, protected and covered where necessary. Additionally, there is adequate space for new materials to be stored in secured covered areas to avoid damage, theft, and to protect these items from weather conditions. ▪ Scaffolding for work in elevated areas should comply with the OSHA "General Requirements for Scaffolds §1926.451" ▪ Falling accidents are the main risks of working on heights. The workers should be provided with the full-body harness and comply with the use of it at all times. ▪ Prepare the evacuation plan for the workers in case of acts of terrorism and violence in the area that threaten the safety of the personnel; ▪ Establish the evacuation routes and agreement with the authorities and army for evacuation and transferring injured personnel to the hospitals ▪ Implement an Emergency Response Plan to manage major incidents if they should occur, such as equipment accidents in the vicinity of the construction site. ▪ Adopt and implement a health management system for the workers, to ensure through medical check-ups, they are fit for work and that they will not introduce disease into local communities			
9	Handling Complaints	▪ Reducing impacts on the community through community and neighbour engagement.	Resident Engineer	PMT	No additional costs

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
		▪ In cases of where there are minority communities speaking a different language in the area or working on site, notices are printed in the common local language. ▪ Provide the proper GRM for handling complaints			
10	Physical cultural resources	▪ In case of accidental discovery stop all works and contact the responsible authority within 24 hours; ▪ Provide training to the construction crew on the mode of conduct in case of accidental findings	Resident Engineer	PMT	No additional costs
11	Workers Influx/Workforce-Community Interactions	• Prepare, adopt and implement a project and workers Grievance Redress Mechanism (GRM). • Develop work procedures, defining a Code of Appropriate Conduct for all workers, including acceptable behavior with respect to community interactions and train workers on its content. • Ensure the provision of information regarding Worker Code of Conduct in local language. • Contractor to avoid hiring "at the gate" to discourage spontaneous influx of job seekers • Train all workers on GBV risks and related sanctions. • Ensure that management and security staff are adequately trained to identify and eradicate all forms pertaining to GBV and gender-based discrimination. • Introduction of strict sanctions (i.e. dismissal) for workers involved in any form of abuse, inappropriate behavior or GBV • Considering ways to minimize entry/exit to site or the workplace, and limiting contact between workers and the community/general public	Contractor	PMT	No additional costs

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
		• Implementing a communication strategy with the community, community leaders and local government in relation to COVID-19 issues on the site.			
Total cost US$ (construction phase)					10,000 US $

Table 16: ESMP during Operation Phase

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
1	Air quality including odors	▪ Water spraying for dust control in maintenance areas; ▪ Draining of ponds to prevent stagnation; ▪ Provide traffic regulation measures to avoid traffic congestion.	Operator	RBD	Included in regular maintenance costs
2	Noise	▪ Advance warning to public ahead of planned maintenance and repair activities; ▪ Restriction on maintenance activities on working hours to 8.00-19.00 during working days and avoidance of works during holidays unless needed on emergency basis. ▪ Provide traffic regulation measures to avoid traffic congestion.	Operator	RBD	Included in regular maintenance costs
3	Traffic	▪ Informing the public about schedule of repair and maintenance works ▪ Provision of temporary alternative access roads/ by-passes ▪ On the spot traffic management	Operator	RBD	Included in regular maintenance costs
4	Handling Complains	▪ Compliance with GRM for one year following opening of the overpasses 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	Operator	RBD	Included in regular maintenance costs

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US$
5	Water resources	▪ Timely and adequate disposal of debris generated by maintenance activities and solid and liquid waste; ▪ Maintaining the drainage ditches and manholes unblocked	Operator	RBD	Included in regular maintenance costs
6	Soil	▪ Maintaining the drainage channels unblocked; ▪ Adequate disposal of waste	Operator	RBD	Included in regular maintenance costs
7	Solid and hazardous wastes	▪ Use of non-toxic paints for repairs; ▪ Storage of hazardous materials used for repairs in sealed containers; ▪ Disposal of waste to authorized disposal sites;	Operator	RBD	Included in regular maintenance costs
Total cost US$ (Operation phase)					No additional costs

7 Environmental and Social Monitoring Plan

The ESMP will be shared with the contractor who will be contractually obligated to abide by it, with financial clauses associated to this obligation. Impacts are mitigated by detailed mitigation measures.

The following tables present monitoring measures in order to perform a non-harmful implementation of the project works to the environment and to reduce the risk of negative environmental impacts as far as possible.

Table 17: Monitoring Activities during Construction Phase

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervis
1	Air quality including odors	Site inspection with the photo documentation; Air quality testing	• Ambient Air quality parameters:PM10, PM2.5, SO2, NOx, CO, Ozone and HC • Compliance with dust abatement measures	Once prior to the start of construction works to establish the baseline and once during the construction phase during the dry season in case of receiving complains of the adjacent community.	Contractor through approved third party.	Resident engineer
2	Noise	Site inspection measuring the level of noise	• Compliance with the time limitations; • Switching off the equipment not in use; • Use of protective gear	Weekly	Contractor	Resident engineer
3	Water resources	• Site inspection with photo documentation; • Water testing	Inspection: • debris accumulation in water drainage areas; • Alteration of water courses; • Signs of spillage of hazardous materials Water testing: pH, Turbidity, Electrical Conductivity (EC), Color, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Chemical Oxygen Demand (COD),	Inspection: • Bi-weekly during the rainy season, and after sporadic rains • Once a month during the dry periods Water testing: in case of spillage of hazardous materials in surface water courses	Contractor through approved third party.	Resident engineer

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
			Biological Oxygen Demand (BOD), Polychlorinated Biphenyls (PCBs)				
4	Soil	• Site inspection with photo documentation; • Soil testing	Inspection: signs of soil erosion, evidence of spills of fuel and lubricants Soil testing: pH, temperature, organic content, poly-aromatic hydrocarbons (PAHs); Faecal coliforms and Total coliforms	• Inspection: bi-weekly; • Soil testing in case of accidental spills	Contractor through approved third party.	Resident engineer	Testing done by accredited laboratories. Additional cost 3000 US $
5	Waste Management	• Site inspections • Maintaining a record of type, quantity, and disposal location of solid and liquid waste generation;	• Storage conditions of hazardous materials; • Disposal at designated sites • Contracts with approved waste disposal contractors • Receipts form disposal sites (if available) • Photo documentation	Inspection: bi-weekly	Contractor	Resident engineer	No additional costs
6	Construction Camp	• Site inspections	• Storage conditions of hazardous materials; • Disposal at designated sites • Contracts with approved waste disposal contractors • Receipts form disposal sites (if available) • Photo documentation	Inspection: bi-weekly	Contractor	Resident engineer	No additional costs

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
7	Traffic	Site inspections	Site surveillance for the presence of fencing/barriers and warning signs, and traffic speed limitations Records on any traffic accidents project-related	Monthly	Contractor	Resident engineer	No additional costs
8	Handling Complains	• Maintaining records of filed complaints and responses	• Time of response to the complaint; • Number of complaints	Monthly	Resident engineer	PMT	No additional costs
9	Public health and safety	• Inspection and photo evidence • Maintaining records of injuries and accidents with cause and location	• Provision and use of personal protective equipment to workers • Installing construction and warning signs	Inspection: bi-weekly	Contractor	Resident engineer	No additional costs
10	Occupational Health and Safety	• Contractor is to prepare OHS Plan to be improved by the supervision Engineer according to the OSHA guidelines • Monitor and report on implementation and integration of H&S Plan by all project personnel throughout the project.	• activities and facilities are in compliance with the H&S Plan	Daily	Contractor	Resident Engineer	No additional costs
11	Workers Influx/Workforce-	All mitigation measures have been implemented (in specific those related to the	• Number of complaints received from the community with regards to workers' behavior in general and the time it took	Monthly	Contractor	Resident Engineer	No additional costs

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
	Community Interactions	code of conduct including GBV and other labor influx risks,) The Code of Conduct has been prepared and formally adopted Number of complaints received from the community with regards to workers' behavior in general and the time it took to solve them. Training records % of workers trained on Code of Conduct % of workers trained on GBV	to solve them. Training records % of workers trained on Code of Conduct % of workers trained on GBV				
Total cost US$ (Construction phase)							8,000US $

Table 18: Monitoring during Operation Phase

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
1	Air quality	Air quality monitoring	Ensure the bridge in the operational condition and there are no hold ups of traffic that can produce excessive exhaust emissions; Inspection on the dust generation by the vehicles	Upon receiving a complaint	Operator	GDRB	No additional costs
2	Noise	Noise level monitoring	Ensure the noise levels are within the acceptable limits	Upon receiving a complaint	Operator	GDRB	No additional costs
3	Water resources	• Surveillance; • Water testing	• Ensure the drainage channels and culverts are clear of debris • Visual inspection for the signs of spillage • Water quality testing: pH, Turbidity, Electrical Conductivity (EC), Color, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Polychlorinated Biphenyls (PCBs)	Surveillance: • Bi-weekly during the rainy season • Monthly during the dry season Water testing: in case of accidental spills Upon receiving a complaint	Operator	GDRB	500 for water testing

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US$
4	Soil	• Surveillance; • Soil testing	• Ensure the drainage channels and culverts are clear of debris • Visual inspection for the signs of spillage • Soil testing: pH, temperature, organic content, poly-aromatic hydrocarbons (PAHs)	Surveillance: • Bi-weekly during the rainy season • Monthly during the dry season Soil testing in areas of the accidental spills and upon receiving a complaint	Operator	GDRB	300 for soil testing
5	Solid and hazardous wastes	• Surveillance; • Maintaining records of quantities of waste and location of its disposal	Waste disposed at designated areas	Monthly	Operator	GDRB	No additional costs
8	Access and traffic	• Surveillance	Presence of warning signs at maintenance site	During maintenance and repair works	Operator	GDRB	No additional costs
9	Health and Safety	• Surveillance; • Maintaining records of quantities of waste and location of its disposal	• Adequate warning about scheduled maintenance works; • Timely and adequate disposal of waste	Monthly	Operator	GDRB	No additional costs
10	Handling Complaints	Record keeping on received complaints	Number of complaints and responses	Quarterly	Operator	GDRB	No additional costs
Total cost US$ (Operation/Maintenance phase)							800 US $ per year

8 Public Participation and Consultation

In order to fulfill the WB requirements and due to the COVID-19 pandemic, a virtual stakeholder meeting was conducted to obtain sound information on the possible impacts on the local communities on 5.11.2020. The participants of the meeting included the following stakeholders:

- Representative of GDRB
- Representatives of the Directorate of Environment
- District governor of Siemel
- Headmen of the neighboring communities

All participants agreed that the construction activities will have a strong positive impact from the social perspectives on the locals.

8. No claims were recorded or alleged regarding the ownership of the land where the construction activities are to take place; all agreed that project area is a governmental land property.
9. No vegetation cover, crops, plants, trees, etc. will be removed in order to execute the rehabilitation activities.
10. No infrastructure will be negatively affected due to the construction activities.
11. Information about a grievance mechanism was introduced. All participants were informed that they can submit their complaint to either site engineer, or to community leader or to PMT during construction.
12. The participants do not anticipate any damage to the buildings or infrastructure during the construction activities;
13. No change to demographics or social structure will be induced by the project activities;
14. Local residents do not use any part of the land required for the project for personal purposes.

A suggested form for carrying out public consultations is included in Annex 4.

9 Grievance Redress Mechanism

The project will establish both **Grievance Redress Mechanism (GRM)**. Information about the grievance handling system described below will be distributed at an early stage of the project to all project affected people through regular information channels used by the project, including initiating meetings at the start of the project where feasible, public meetings during project implementation, brochures/pamphlets in Kurdish and Arabic Languages, posting on notice boards and online when necessary. The process of raising a complaint should be explained by reaching out the community or by conducting a meeting with community representatives. It is important that community representatives include women at all times.

Transparency and accountability should be core elements of the Project. Comprehensive GRM will be set up to account for all potential complaints arising from the project's potential impacts. This will cover all types of complaints including those associated with gender-based violence (GBV), sexual exploitation and abuse (SEA), and sexual harassment (SH). The latter complaints will be directed to a separate unit and handled separately.

The goal of the GRM will be to increase transparency and accountability and to reduce the risk of the project inadvertently affecting citizens and serves as an important feedback and learning mechanism that can help improve project impact. The objective will be to provide channels for project stakeholders to provide feedback on project activities via a mechanism that allows for the identification and resolution of issues affecting the project, promptly and effectively in a culturally appropriate manner and at no cost. This includes safeguards-related complaints pertaining to this ESMP and the World Bank's OP/BPs as a whole.

The community GRM will be developed at the General Road and Bridges Directorate/Project Management Team with dedicated personnel and made accessible to all.

The following types of grievances are anticipated:

- Damage to existing infrastructure
- Traffic and access-related impacts
- Road accidents related to project's traffic impacts
- Community health & safety
- GBV, SEA and SH
- Impacts associated with generated waste

- Noise and air quality impacts

As a minimum, the project will establish the following channels through which citizens/beneficiaries/PAPs can make complaints regarding project-funded activities:

a) A dedicated phone line[8]
b) A dedicated address[9] to send written letters
c) Feedback boxes located at project sites
d) Verbal or written complaints to community leaders, or to a dedicated local focal point, or project staff directly or through project meetings. If project stakeholders provide verbal feedback/complaint, project staff will lodge the complaint on their behalf, and it will be processed through the same channels.
e) Periodic project meetings, each of which shall include a fair representation of all project's stakeholders including women and the elderly.

The GRM will comprise of a set of operating procedures to ensure successful implementation. The procedures will include the following set of measures as a minimum:

- Receipt, acknowledgment and registration
- Grievance verification and assessment
- Conduct field inspections in order to verify and confirm the authenticity and eligibility of the reported grievance. The field inspection could include interviews with different parties involved.
- Response and Feedback including Referring cases to other GRMs, if necessary and/or to the courts and/or to a third party
- Agreement and implementation of the response
- Track, and evaluate the process and results

In case an agreement could not be reached, the borrower could play the role of a mediator via well-trained voluntary mediators following a pre-set time frame.

For the community GRM, a multi-stage mechanism will be used comprising of but not necessarily limited to the stages listed below:

[8] Phone lines on the focal social and environmental focal points at the GDRB of the Duhok governorates will be shared as soon as they are assigned.
[9] For each sub-project , the address of the nearest GDRB will be identified and shared with the community.

1- Receipt, acknowledgment and registration

As mentioned, the GRM will enable aggrieved stakeholders to communicate their grievances through a variety of accessible channels: phone, letter, fax, social media applications including sharing photos of the grievance site and location, in-person meeting, and others. It is proposed that complainants have the option to provide their names or keep it anonymous. However, only a reply contact is required in order to update the complaints of the status of his grievance. In certain situation this could also be optional as per the complainant's choice.

While recognizing that many complaints may be resolved" on the spot" and informally by the PMTs' Directorate-GRM staff. There are still opportunities to encourage these informal resolutions to be logged into a GRM database to (i) encourage responsiveness; and (ii) ensure that repeated or low-level grievances are being noted in the system. The following describes the receipt, acknowledgment and registration process:

- The complainant submits the grievance through one of the dedicated channels indicated above.
- The complainant is requested to use to the extent possible a grievance template which will be shared in hard/soft copies and also available to download from the website
- If the complainant wishes to submit the grievance orally via phone or in person, the project staff will lodge the complaint on their behalf, and it will be processed through the same channels.
- Requests for confidentiality will be considered. This option shall be made clear to the complainant in the Grievance template and/or in cases of oral submissions.
- In case of confidentially option request, it is also important that the complainant chooses to provide contact details or any other suitable means for him/her to be updated on the status of their complaints/grievances.
- All received grievances shall be logged into the community grievance log.
- In all cases, the staff in charge should provide a timely communication back to the complainant(s) that their grievance has been received, will be logged and reviewed for eligibility and provide them with the registration number.

2- Grievance verification and assessment

- In order to verify the grievance, it should be discussed with the complainant, investigated and evidence gathered to the extent possible. This should include field inspections if needed in order to conduct interviews and gather information about the incident or the case.

The GRM staff will need to make a decision with regards to the eligibility of the grievance or whether it should be directed to other mechanisms or to a different office within the Ministry and its Directorates, or to a different organization altogether . The following represents the proposed eligibility criteria:

- Does the complaint indicate that any of the programs' projects has caused a negative economic, social, or environmental impact on the complainant, or has the potential to cause such an impact?
- Does the complaint specify what kind of impact has occurred or may occur, and how the program has caused or may cause that impact?
- Does the complaint indicate that those filing the complaint are the ones who have been impacted, or are at risk of being impacted; or that those filing the complaint are representing the impacted or potentially impacted stakeholders at their request?
- Does the complainant provide enough information for GRM staff to decide on the first three questions?

3- Response and Feedback

- **As an initial response**, the complainant will be informed with the eligibility results as well as all the steps being taken to address his concerns. This initial response shall be provided via a formal letter; an email; or a phone call within 3 working days from the date of receipt of the grievance.
- **For eligible and straightforward grievances**, GRM staff will provide a response without further investigation within 10 days from the initial date of receipt of the grievance, where actions are proposed to resolve the complaint and agreement on the response is sought with the complainant.
- **For eligible grievances that require further assessment**, GRM staff will further engage with the complainant via a phone call or a formal meeting in order to collect further information. Based on this, they will provide a response within 14 days from the initial date of receipt of the

grievance, where actions are proposed to resolve the complaint and agreement on the response is sought with the complainant.

- There will be a time limit of 7 days from the day of receipt **for fast track responses** in case of complaints alleging serious harm or violations. Immediate response will be taken where required.
- In all the above mentioned scenarios, the response should include a clear explanation of the proposed response including any alternative options, while clarifying to the extent possible the rights of the complainant, and the choices he has including the following: 1- to agree to proceed; 2- request for a second round of assessment; 3- to consider any other organizational, judicial or non-judicial possibilities.
- In case the grievance feedback is satisfactory to the complainant, the response should be implemented.
- In case the grievance feedback is not satisfactory to the complainant, he/she has the right to appeal within 5 working days. In such case, a second tier should be initiated where the GRM staff will attempt to propose alternative options and carry out additional investigation in order to meet the concerns of the complainant, and other stakeholders. The GRM staff should send their response within 7 days from the date of the appeal. The second tier response should also include a clear explanation of the proposed response including all alternative options and the choices the complainant has as described above.

4- Agreement and implementation of the response

- If the grievance has been resolved, the GRM staff will document the actions taken, time it took to resolve the grievance and satisfactory resolution.
- If the grievance has not been resolved, the GRM staff should document additional information including actions taken, communication with the complainant, and the final decisions made by the complainant and the organization with regards to any other alternatives.
- In general, confidentiality should be maintained in GRM documentation, if the complainant has requested so.
- In all cases, the total number of grievances should be recorded including time it took to resolve them, as well as the number of unresolved cases.

10 Conclusion

The ESMP concludes that the proposed construction of the overpasses on Segment 2 will have an overall significant beneficial impact on the affected population. The implementation of the recommended mitigation measures especially during the construction phase will ensure that potential negative environmental impacts are addressed.

Annex 1: Procedures for Public Consultations during COVID-19 Pandemic

It is recommended to avoid any group meetings, face-to-face meetings and public consultation events.

Virtual engagement may include communication by phone, text, e-mail, phone or video conference calls and webinars. Any technology that resonates with the targeted stakeholders and allows for researcher/stakeholder interactions can be harnessed to assist with engagement. Examples of engagement modes and ways that might be utilized include:

- Phone (One-on-one calls between consultant and stakeholders),
- Group conference calls,
- Having discussions via a closed Facebook group,
- Videoconference platforms,
- Hosting online meetings with stakeholders.

It is strongly recommended to:

- Ensure that new modes of engagement are feasible and acceptable to stakeholders,
- Let stakeholders be the guide and to ask for their preferred way to engage remotely,
- Be sensitive to barriers stakeholders may face in engagement using a particular method (e.g., lack of internet access),
- Whenever possible, offer multiple ways to engage. For example, you might provide an option to call in to an online meeting via phone, and send materials out in advance via WhatsApp,
- Ask for stakeholder feedback throughout the project and work to address any issues hindering their engagement,
- If using videoconferencing or other online platforms:
    - Provide participants with necessary technological tutorials or technical support in advance, including written instructions for utilizing the technology.
    - Understand that stakeholders' technological literacy will vary, and be willing and available to answer questions.
    - Have a facilitator from the targeted community work with you to adjust stakeholders to the technology used.
    - When possible, have a lower-tech option for engaging, such as the option to call in to a videoconference via phone

Annex 2: World Bank Operational Procedures relevant to the Project

OP/BP 4.01 Environmental Assessment

This policy is triggered if a project is likely to have significant adverse environmental impacts in its area of influence. For category A projects, a comprehensive ESIA will be required with emphasis in integrating environmental measures in project planning, design, implementation and operation, in addition to help ensure the environmental soundness and sustainability of investment projects.

The Environmental Assessment takes into account the natural environment (air, water, and land); human health and safety; and social aspects (involuntary resettlement, physical cultural resources, etc.) in addition to trans-boundary and global environmental aspects. This operational policy states the roles of the Bank and the Borrower:

The Bank mainly screens and sets the environmental assessment category and advises the borrower in terms of the Environmental Assessment requirements. The Bank reviews the findings and recommendations of the EA to determine whether they provide an adequate basis for processing the project for Bank financing. When the borrower has completed or partially completed EA work prior to the Bank's involvement in a project, the Bank reviews the EA to ensure its consistency with this policy. The Bank may, if appropriate, require additional EA work, including public consultation and disclosure.

The Borrower assists the bank in proper screening and will be responsible for carrying out environment assessment in compliance with the Bank's rules and national laws. The Borrower will also be responsible in consulting project affected persons and local Non-Governmental Organizations. The Borrower will disclose the draft/final documents and respond to any feedback provided from the Bank and/or the Public/stakeholders.

The World Bank Policy on Access to Information – 2013

In addition to the safeguards policies and procedures, the Access to Information Policy is also relevant. To promote transparency and facilitate accountability, Bank Access to Information Policy supports decision making by the Borrower and the Bank by allowing public access to information on environmental and social aspects of projects, in an accessible location and in understandable language and format, suitable to key stakeholders. The Bank ensures that project- relevant environmental and social safeguard documents, including the procedures prepared for subprojects, are disclosed in a

timely manner before formal start of a project appraisal. The policy requires disclosure in both English and the local language and must meet the standards of the World Bank.

Annex 3: Environmental and Social Liabilities of CTP Contractors

Further to enforcing the compliance of environmental management, contractors are responsible for complying with health and safety requirements where they are to provide insurance for construction laborers, staff attending to the construction site, and citizens for each sub-project. The insurance requirements and clauses are stated in the procurement manual and reflected in the bidding documents complying to the Iraqi labor law. Monitoring of these components is integrated in bidding evaluation, and site visits reports.

Implementation of CTP program provides some short-term and fewer long-term job opportunities for local community; this information is cited from CTP's baseline section.

The environmental and social management of the construction works becomes essential parts of a works contract upon its conclusion and their implementation is mandatory for a contractor. The GDRB, as an owner of construction works, will be responsible for enforcing compliance of contractor with the terms of the contract, including adherence to the ESMPs.

The following procedures prevail, in addition to the supervisor engineer judgment:

- Deduction of environmental noncompliance will be added as a clause in the Bill of Quantities (BOQs) section, referring to annex in the bidding document detailing the deduction procedures;
- Environmental penalties shall be calculated and deductions are to be included in each submitted invoice;
- Mitigation measures in Environmental and Social Monitoring Matrices (ESMM) annexed to the relevant ESMP is the reference for environmental notes and penalties;
- Each impact depicted in the ESMM if not properly mitigated to be counted an environmental/social note;
- For minor infringements and social complaints, an incident which causes temporary but reversible damage, the contractor will be given environmental and social note/ stop and alert to remedy the problem and to restore the environment. If reviewing the action by the Environmental and Social Officer (ESO) showed that restoration is done satisfactorily no further actions will be taken;
- For social notes: the ESO will stop and alert the contractor to remedy the social impact, the ESO will follow the issue until solved. If contractor didn't comply to remediation request, stop will be considered under no excused delay;
- If the contractor hasn't remedied the environmental impact during this given time, the ESO/supervisor engineer in cooperation with Local Technical Consultant will:
  - Stop the work and give the contractor an environmental and social note correlated to financial penalty according to the non-complied mitigation measure depicted in the biding document and the following procedures for National Competitive Bids and Shopping Bidding Documents;
  - The ESO after the given time frame are to review the action, if ESO sees that restoration is done satisfactorily no further actions will be taken, otherwise and if Contractor hasn't remedied

the situation within 1 day any additional days of stopping work will be considered no excused delay;

- When ESO issue an environmental/social note, it might depict one or more environmental penalty; and
- If repeating the noncompliance to ESMF penalties approached (3-5) % of the contract value, the ESO will raise the formal recorded environmental and social notes and the deduction history to the GDRB in order to take a legal action. Considering that bidding document include environmental penalty in the BOQ, the ESMP and deduction procedures in annexes and referred to in particular conditions.

The following form will be used for the environmental/ social note:

Environmental and Social Note No ( )	
Municipality	Date
Project Name	
Site Location	
Contractor	
The Environmental Note	
Municipality Supervisor /Engineer	
Local Technical Consultant	
Contractor Representative on time of note	
Submitted to Contractor Representative	
Copy Submitted to GDRB on	
Hour	
Date	

Procedures for National Competitive Bids and Shopping Bidding Documents:

As mentioned above, environmental and social notes might contain one or more environmental penalty applicable for deduction.

- For social notes: stop and alert the contractor to remedy the action;
- For environmental notes: refer to the ESMP for the note to verify how many notes illustrated in the note;
- Deduction rate starts with 0.1% of contract value; and
- Deduction rate increase by 0.05% of the contract amount after each fifth note.

For National Competitive Bids:

ESMP Compliance Penalty for National Completive Bids

ESMF Compliance Penalty		
No.	**Environmental and Social Note**	**Penalty**
1	1	Stop and alert
2	2+3+4+5+6	Stop and deduct 0.1% of the contract amount for each mitigation measure in the environmental note. Minimum amount of deduction is 150 Euro
3	7+8+10+11+12	Stop and deduct 0.15% of the contract amount for each mitigation measure in the environmental note Minimum amount of deduction is 225 Euro
3+1	Next five notes	Each 5 notes + deduction would be: N= percentage of deduction of (N-1) + (0.5* percentage of deduction of (N-1)) For example: Stop /Deduct 0.1%+0.05(0.1%) of the contract amount for each mitigation measure in the environmental note. Minimum amount of deduction is 300 Euro
5	Note +1	If penalty rate approach 5% of contract cost it is recommended to stop work and send official request to MOB of the proposed action according to bidding documents and procurement manual

Deduction is to be calculated by the relevant GDRB Engineer (ESO) and to be reviewed by the supervisor engineer where he is to consider the environmental Note (N), and the deduction for N.

Deduction for N= [percentage of deduction of (N-1) + (0.5* percentage of deduction of (N-1)]* contract Amount.

If Penalties Rate approach 5% of Contract cost its recommended to stop work, and send official request to GDRB of the proposed action according to bidding documents and procurement manual.

Municipality can decide if a mitigation measure has a significant impact and might require setting its noncompliance penalty rate based on its significance.

For Shopping Bidding Documents:

- For social notes: stop and alert the contractor to remedy the action;
- For environmental notes: refer to the ESMP for the note to verify how many notes illustrated in the note;
- Deduction rate starts with 0.1% of contract value; and
- Deduction rate increase by 0.05% of the contract amount after each fifth note.

ESMP Compliance Penalty for Shopping Bidding Documents

ESMF Compliance Penalty		
No.	**Environmental and Social Note**	**Penalty**
1	1	Stop and alert
2	2+3+4+5+6	Stop and deduct 0.1% of the contract amount for each mitigation measure in the environmental note. Minimum amount of deduction is 40 Euro
3	7+8+10+11+12	Stop and deduct 0.15% of the contract amount for each mitigation measure in the environmental note Minimum amount of deduction is 60 Euro
3+1	Next five notes	Each 5 notes + deduction would be: N= percentage of deduction of (N-1) + (0.5* percentage of deduction of (N-1)) For example: Stop /Deduct 0.1%+0.05(0.1%) of the contract amount for each mitigation measure in the environmental note. Minimum amount of deduction is 80 Euro

5	Note +1	If penalty rate approach 3% of contract cost it is recommended to stop work and send official request to MOB of the proposed action according to bidding documents and procurement manual

Deduction is to be calculated by the GDRB (ESO) and to be reviewed by the Supervisor Engineer where he is to consider the environmental Note (N), and the deduction for N.

Deduction for N= [percentage of deduction of (N-1) + (0.5* percentage of deduction of (N-1)]* contract Amount.

If Penalties Rate approach 3% of Contract cost its recommended to stop work, and send official request to GDRB of the proposed action according to bidding documents and procurement manual.

The GDRB (ESO) can decide if a mitigation measure has a significant impact and might require setting its noncompliance penalty rate based on its significance.

Annex 4: Public Consultations

1	In your opinion, would the construction of overpasses have positive impact on the residents of the area?	yes	no
2	Are there any claims on private land ownership in the project area?	yes	no
3	Would there be any damages to income generating crops, trees, and vegetation due to the construction activities?	yes	no
4	Would there be any losses of income of local residents due to the construction activities?	yes	no
5	Would there be any damages whether permanent or temporary which would affect the livelihood of the residents due to the construction activities?	yes	no
6	Would the construction activities require relocation of the residents of the area, whether permanent or temporary?	yes	no
7	Is there any usage by local residents of the facilities or land of the facilities by the local residents?	yes	no
8	In your opinion, would there be any negative social impacts due to the construction activities?	yes	no
9	Would there be any changes to the demographics or social structure in the project area induced by the construction activities?	yes	no
10	Would there be any damages to the structures or houses induced by the construction activities?	yes	no
11	Will the project improve the operations of transportation and reduce the isolation of the communities adjacent to the overpass?	yes	no
12	Is there any need for warning and directional signage during the construction activities?	yes	no