United States Agency For International Development

Environmental Assessment

of the

Moghul Khil and Mohammad Agha Intakes Rehabilitation Project

A part of the Rehabilitation of Economic Facilities and Services (REFS) Program

Contract 306-C-00-02-00500-00

Prepared By:

The Louis Berger Group, Inc.

2300 N Street NW

Washington, DC 20037

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EXHIBIT 3-1
POTENTIAL IMPACTS AND MITIGATION

ENVIRONMENTAL CRITERIA	POTENTIAL IMPACTS	Avoidance / Mitigation Action
1.0 PHYSICAL RESOURCES		
1.1 Topography	Embankments	Provisions for the treatment of slops to ensure stabilization are incorporated in the contract provisions. No borrow pits will be excavated.
	Quarry Operations	Only licensed quarrying operations are to be used; if licensed quarries are not available the Sub-Contractor will be responsible for setting up their dedicated crusher plants at approved quarry sites.
	Erosion/Scour	Rehabilitation of an existing spill ways and other drainage facilities is planned. Accordingly, no significant adverse erosion/scour impacts area anticipated. No mitigation actions required.
1.2 Soils	Erosion/Scour	See **1.1** above
	Contamination Due to Spills	Fuel and chemical storage will be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks. Filling and refueling shall be strictly controlled and subject to formal procedures. All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use. The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses. The contract specifications also require the preparation of an Emergency Response Plan to deal with accidents and emergencies, including environmental/public health emergencies associated with hazardous material spills and similar events.
1.3 Seismic & Geological Characteristics	Demand for Quarried Materials	Only licensed quarrying operations are to be used; if licensed quarries are not available the Sub-Contractor will be responsible for setting up their dedicated crusher plants at approved quarry sites.
	Seismic Vulnerability	Earthquake Loading Design is specified for the Project.
1.4 Hydrology	Surface Hydrology	No significant interruptions or diversions or flow are anticipated. No significant increase in water usage is anticipated. Potential impacts during the rehabilitation process will be mitigated through coordination with local land use planning authorities and local residents. Construction camps and other potential sources of secondary impacts must be properly sited and provided with drainage and wastewater facilities. During rehabilitation all projects works should impact as little as possible on the supply of water to the downstream irrigation system and subsequent agricultural lands. There will be no disruption to water supply during rehabilitation works, all waters shall be diverted to ensure constant supply. Rehabilitation activities should be timed so minimal disruption to agricultural areas is achieved. On embankment areas less than three meters in height and where surface runoff is low, ditches shall be placed adjacent to the toe. For higher fills (if any), the ditch shall be separated from the fill by a three-meter wide bench. Construction-related interference with the supply to, of abstraction from, of the pollution of, water resources is prohibited. The Sub-Contractor shall not discharge or deposit any matter arising from the execution of the Work into any waters except with the permission of the regulatory authorities concerned. Existing stream courses and drains must be kept safe and free from any debris and any materials.
	Wetlands	No wetlands of significant biological importance are within the potentially affected area. No mitigation actions, other than those incorporated in the Project, are warranted.
	Subsurface Hydrology	No impacts to subsurface hydrology are anticipated. The Sub-Contractor is required to prevent interference with the supply to, of abstraction from, or pollution of, water resources including underground percolating water…"
	Flood characteristics	No impacts resulting from flood conditions are anticipated. No mitigation actions required.
1.5 Air Quality &	Rehabilitation	- The Sub-Contractor will be required to spray road surfaces, excavation

Climate	Impacts	and construction sites. - Trucks carrying earth, sand or stone will be covered with tarps. - Contract provisions allow suspension of work in unfavorable condition. - Machinery and equipment will be fitted with pollution control devices and checked at regular intervals. - Open burning will be prohibited in populated areas.
1.6 Mines and Unexploded Ordnance	Uncontrolled Detonation	The Project has received a Certificate from the United Nations Mine Action Center that there are no mines/UXO at or near the site.
2.0 NATURAL/BIOLOGICAL RESOURCES		
2.1 Flora	Destruction of Habitat	The project is not anticipated to have significant negative impacts to flora within the vicinity of the project.
2.3 Fauna	Destruction of Habitat	The project is not anticipated to have significant negative impacts to fauna within the vicinity of the project.
2.3 Aquatic Habitat	Destruction of Habitat	The project is not anticipated to have significant negative impacts on natural habitats within the vicinity of the project.
2.4 Protected Areas	Rehabilitation Impacts	There are no protected areas within 75 kilometers of the Project site.
3.0 OTHER ENVIRONMENTAL CONCERNS NOTED BY 22 CFR 216		
3.1 Land Use & Development Policies and Controls	Potential PAPs Impacts	No impacts to project-affected persons (PAPs) as that term is generally defined by the international assistance community (i.e., persons whose livelihood is directly or indirectly affected by a project) have been identified. Adoption of guidelines attached as **Appendix B** are recommended in the event that such impacts emerge unexpectedly.
	Rehabilitation Impacts	Coordination with local land use planning authorities is required. Construction camps and other potential sources of secondary impacts must be properly sited and provided with drainage and wastewater facilities.
	Operational Impacts	Impacts are expected to be minimal. No mitigation actions warranted.
3.2 Energy & Conservation	Exploitation of Energy Resources	Impacts are expected to be minimal. No mitigation actions warranted.
	Demand for Petroleum Products	Impacts are expected to be minimal. No mitigation actions warranted.
3.3 Use of Natural / Depletable Resources	Exploitation of Natural Resources	Impacts are expected to be minimal. No mitigation actions warranted.
	Demand for Construction Materials	Impacts are expected to be minimal. No mitigation actions warranted.
3.4 Urban Quality Design of Built Environment	Impacts to Roadside Structures and Activities	Impacts are expected to be minimal. No mitigation actions warranted.
3.5 Historic & Cultural Resources	Demolition or Damage Due to Rehabilitation	No sites of historical or cultural significance have been observed within vicinity of the Project that maybe affected by Project activities. However, contractors are required to consult with provincial-level representatives of the Archaeological Committee under the Ministry of Information and Culture, obtain any necessary clearances in regard to historic and cultural resources prior, and provide written documentation of these consultations to the Contractor prior to the initiation of work. In the event of unanticipated discoveries of cultural or historic artifacts, the Sub-Contractor is obligated to shall take all necessary measures to protect the findings and shall notify the Contractor and provincial-level representatives of the Archaeological Committee and the Ministry of Information and Culture. If continuation of the work would endanger the finding, project work shall be suspended until a solution for preservation of the artifacts is agreed upon.

4.0 ADDITIONAL ENVIRONMENTAL CONCERNS RAISED BY SIMILAR PROJECTS		
4.1 Socio-Economic Considerations	Impacts are Deemed Beneficial	No mitigation actions warranted.
4.2 Public Health & Safety	Disease Transmission	The Sub-Contractor is required to provide basic emergency heath facilities for worker; and encourage programs aimed at the prevention of sexually transmitted diseases as a part of all construction employee orientation programs.
	Access to Heath Facilities	Access to health facilities will not be affected by Project activities. No mitigation actions required.
	Contamination Due to Spills	See **1.4** above.
	Air and Noise Impacts	See **1.5** above and **4.3** below.
4.3 Noise	Noise impacts to sensitive receptors	Impacts are expected to be minimal. No mitigations warranted other than those specified on contract provisions.
4.4 Other Infrastructure Networks	Water Supply & WW Collection Networks	Impacts are expected to be minimal. No mitigation actions warranted.
	Irrigation Systems	Impacts will be beneficial.

- Seismic & Geological Conditions (Item 3.2.3)
- Hydrology (Item 3.2.4)
- Climate and Air Quality (Item 3.2.5)
- Mines and Unexploded Ordnance (Item 3.2.6).

Item 3.3 (Natural/Biological Resources) - the natural/biological aspects of the potentially affected environment. These are discussed under the sub-headings of:

- Flora (Plant Species) (Item 3.3.1);
- Fauna (Wildlife) (Item 3.3.2);
- Aquatic Habitat (Item 3.3.3); and
- Protected Areas (Item 3.3.4).

In addition to these requirements, Paragraph 216.6 of the Procedures states that "… *Environmental Assessment(s) should include discussions of ….. possible conflicts between the proposed action and land use plans policies and controls for the areas concerned; energy requirements and conservation potential of various alternatives and mitigation measures; natural or depletable resource requirements and conservation potential of various requirements and mitigation measures; urban quality; historic and cultural resources; design of the built environment; reuse and conservation potential of various alternatives and mitigation measures; and means to mitigate adverse environmental impacts*". Accordingly, these issues are addressed under the following heading and subheadings:

Item 3.4 (Other Environmental Concerns Noted by 22 CFR 216) describes these aspects of the environment under the following sub-headings:

- Land Use and Development Policies & Controls (3.4.1)
- Energy & Conservation (3.4.2)
- Use of Natural/Depletable Resources (3.4.3)
- Urban Quality/Design of the Built Environment (3.4.4)
- Historic and Cultural Resources (3.4.5)

EXHIBIT 4-1
ENVIRONMENTAL MITIGATION FINAL DESIGN CHECKLIST

For Air Quality, Water, Soil, Noise and Social Impacts

AIR QUALITY

Potential Impact Source	Mitigation Objective	Mitigation Checklist Do designs and bid documents include the following provisions?	Implementation Mechanism & Responsibility
Material Transport	Minimization of dust during transport of construction material	Rock, sand and other dust producing material will be sprayed prior to transport. Trucks must be covered with tarps. Only approved transport routes will be used.	Required by Project Contracts. Enforced by the Supervising Engineer (SE).
Material Storage	Minimization of dust during storage of construction material.	Stockpiles of materials shall be sited in sheltered areas away from sensitive areas and covered with tarps if required.	Required by Project Contracts. Enforced by SE.
Emissions from Construction Equipment & Solvents	Avoidance of excessive emissions due to poorly maintained equipment.	Contract stipulations require all construction equipment to meet acceptable standards and to be properly maintained and located at least 500 meters from the nearest sensitive receptor. Solvents and volatile materials must be used and stored properly to the satisfaction of the SE.	Required by Project Contracts. Enforced by SE.
On-Site Burning	Avoidance of smoke and gases which may constitute a nuisance.	On-site burning to be banned in populated areas	Required by Project Contracts. Enforced by SE.
Dust Generating Operations	Avoidance of dust generating operations during periods of high wind	In periods of high winds, dust generating options shall not be permitted within 200 meters of sensitive sites given the direction of the prevailing wind.	Required by Project Contracts. Enforced by SE.

WATER QUALITY

Potential Impact Source	Mitigation Objective	Mitigation Checklist Do designs and bid documents include the following provisions?	Implementation Mechanism & Responsibility
Uncontrolled Runoff During Project Works	Avoidance of inadequately planned runoff due to development of staging areas, labor camps, etc.	Runoff from during project works will be strictly controlled as a part of construction supervision activities. Monitoring will be undertaken as a routine part of construction supervision.	Required by Project Contracts. Enforced by SE.
Disruption of Irrigation	Avoidance of interruptions to irrigation flows due to project works.	Irrigation systems have been taken into account in design and at no time will water supply be interrupted due to project works. Alternative water sources will be developed as warranted due to temporary interruptions.	Required by Project Contracts. Enforced by SE.
Effects of Construction Camps & Staging Areas	Avoidance of inappropriate wastewater disposal and runoff.	Provisions for the location and design standards for land use, drainage, health facilities, etc., are established by construction documents.	Required by Project Contracts. Enforced by SE.

SOILS

Potential Impact Source	Mitigation Objective	Mitigation Checklist Do designs and bid documents include the following provisions?	Implementation Mechanism & Responsibility
Inadequate Slope Stabilization	Minimize soil loss during slope creation and due to erosion and slope failure in the longer-term.	Side slopes standards have been established to reduce erosion potential and/or, if necessary, stabilized, covered with rip-rap or other material to prevent soil erosion. Where appropriate embankment slopes will be stabilized by re-vegetation with grazing resistant plant species, placement of fiber mats, rip-rap, rock gabions, or other appropriate technologies.	Incorporated in design. Enforced by SE. Operational maintenance by MPW.
Soil Loss Due to Water-Related Erosion		Discharge zones from drainage structures will be furnished with rip-rap when warranted, particular in instances in which drainage structures are installed and/or road formation levels are raised and create bare slopes that require stabilization. Down drains/chutes will be lined with rip-rap/masonry or concrete to prevent erosion.	Incorporated in design. Enforced by SE. Operational maintenance by MPW.
Uncontrolled Runoff from Project Works & Labor Camps	Avoid soil due to poorly designed and/or maintained constructor and labor camps.	Runoff will be controlled by proper siting of camps and staging areas.	Required by Project Contracts. Enforced by SE.

NOISE

Potential Impact Source	Mitigation Objective	Mitigation Checklist Do designs and bid documents include the following provisions?	Implementation Mechanism & Responsibility
Construction Machinery	Minimize high noise levels, vibrations at time of occurrence	Use equipment conforming to international standards and directives on noise and vibration. Maintain exhaust systems in good working order, properly design engine enclosures, use intake exhaust silencers and regularly maintain noise generating equipment.	Required by Project Contracts. Enforced by SE.
Pile Driving	Minimize high noise levels, vibrations and time of occurrence.	To be mitigated through use of : - Time limits for pile-driving activities. - Bored piles in sensitive areas. - Shrouds where warranted.	Required by Project Contracts. Enforced by SE.
Paving And Other Rehabilitation Activities.	Minimize high noise levels and times of occurrence.	Limited construction hours in sensitive areas. Use of properly maintained equipment. Use of noise barriers where warranted. Public notification of construction activities and timing of activities generating significant noise and vibration levels.	Required by Project Contracts. Enforced by SE.

SOCIAL

Potential Impact Source	Mitigation Objective	Mitigation Checklist Do designs and bid documents include the following provisions?	Implementation Mechanism & Responsibility
Disruption of Economic Activities	Minimize loss of income due to disruptions.	Unavoidable disruptions will be compensated per the recommended Guidelines and Irrigation Study for the Rauzwa area.	GOA and SE.
Temporary Impacts Due to Rehabilitation Works	Minimize temporary impacts to residents and surrounding environment.	Coordinate all construction activities with neighboring land uses and respect rights of local landowners. Maintain and clean up construction camps.	Construction requirements enforced by SE.
Health and Safety Impacts to Workers	Attend to the health and safety of Workers	Provide local, basic emergency health facilities for workers and incorporate programs aimed at the prevention of STDs.	Construction requirements enforced by SE.
In-migration of Labor	Avoidance of social tensions. Due to competition for resources.	Mitigated by control of labor camps (if any) employee orientation and public information programs.	Construction requirements enforced by SE.

HISTORIC AND CULTURAL RESOURCES

Damage to Cultural and Historic Sites during Project Works	Protect Sites of historic and cultural importance	Placement of suitable fencing and barriers near sites of known antiquities, and historic and cultural resources. Adhere to accepted international practice and all applicable historic and cultural preservation requirements of the GOA In the event of unanticipated discoveries of historical or cultural artifacts the Contractor will notify the MIC.	GOA and SE

- Controls of hazardous materials.

- Transport of dust-generating items using tarps and other devices to minimize impacts.

- Spraying of road surfaces, excavation and construction sites to keep them moist for dust control as determined advisable by the SE.

- **Water Quality Impacts.** Potential water quality impacts during the rehabilitation phase will also be mitigated through the controlled location of asphalt plants and similar sources of runoff, erosion controls, proper siting and provision of facilities at construction camps as tabulated by **Exhibit 4.1** with compliance assured through the oversight of the SE.

- **Soils Impacts.** Potential soil impacts will be mitigated through the control of waste disposal practices and runoff as tabulated by **Exhibit 4.1** as a routine part of construction supervision and enforced through the monitoring of the SE.

  - Embankment & Erosion Prevention Requirements

  - Mining/Quarry Activities – I.e., the requirement that only licensed quarrying operations are to be used for material sources, if available, and the contingency