



JSC “Rogun HPP”

State Enterprise “Directorate for Flooding Zone of Rogun HPP”

Project Management Group for Energy Facilities Construction under the President of the Republic of Tajikistan

ROGUN HYDROPOWER PROJECT – UPDATED ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Volume III: Environmental and Social Management Plan





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1 INTRODUCTION

- 1.1.1. The Government of Tajikistan has established the Project Management Group (PMG) for Energy Facilities Construction under the President of the Republic of Tajikistan, which is the implementing entity for construction of the Project to oversee the construction and operation of Rogun Hydropower Project (HPP).
- 1.1.2. Some activities during the continued construction and expanded operation of Rogun HPP and the completion of the resettlement program (collectively, the Project) could result moderate or major significant effects on environment and social resources if they are not managed or controlled. These have been identified and described in **Volume 1, Chapter 8: Impact Assessment**.
- 1.1.3. Measures to ensure significant adverse effects are avoided, mitigated, or otherwise reduced to acceptable levels have also been identified. These shall be implemented in compliance with the laws of the Republic of Tajikistan and the ESHS standards of the World Bank and a number of international financial institutions (IFIs) ('the Applicable Standards'). A detailed overview of the Applicable Standards is provided in **Volume I, Chapter 2: Administrative Framework**.
- 1.1.4. The project organization is complex, and all parties will be required to ensure that proper planning, construction, and operating procedures are implemented throughout the procurement, mobilization, construction, and operation phases of the HPP and throughout planning and implementation of the resettlement program.
- 1.1.5. This Environmental and Social Management Plan (ESMP) summarizes the measures that must be taken to ensure that potential impacts are avoided, reduced, or otherwise mitigated during all phases of the Project.
- 1.1.6. The principal objective of the ESMP is to “operationalize” the commitments to ESHS management and mitigation that are identified in the ESIA, in particular in **Volume 1, Chapter 8: Impact Assessment** and in the management plans in Volume 3. This in turn will maximize the benefits to, and minimize the negative impacts on, the people and the environment within the Project’s area of influence.
- 1.1.7. Decommissioning of the Project infrastructure will be subject to a full decommissioning plan in line with requirements in place at the appropriate time. Consequently, ESHS actions associated with the decommissioning phase of the Project are not included in the ESMP.

2 APPLICABLE STANDARDS AND GUIDELINES

2.1.1. The Applicable Standards include the following:

Republic of Tajikistan law, including international agreements to which Tajikistan is a party
The World Bank (WB) Environmental and Social Framework (ESF) (2018) including the ten E&S standards (ESS), as well as the WB Group General Environmental, Health, and Safety (EHS) Guidelines (2007) and relevant Industry Sector EHS.

The European Investment Bank (EIB) Environmental and Social Framework (ESF), consisting of the E&S policy (2022) and revised E&S standards (2022).

EIB Environmental, Climate, and Social (ECS) Guidelines on Hydropower Development (2019).

The European Bank for Construction and Development (EBRD) Environmental and Social Policy and Performance Requirements (PRs) (2019).

Asian Development Bank (ADB): Safeguard Policy Statement (SPS) (2009) and associated safeguard documents.

Asian Infrastructure Investment Bank (AIIB): Environmental and Social Framework (2019, 2021, and 2022).

Environmental and social standards, objectives and goals prescribed by other development financial institutions, including the Islamic Development Bank, the Eurasian Development Bank (EDB); the Saudi Fund for Development (SFD), and the Kuwait Fund for Arab Economic Development (KFAED).

3 ENVIRONMENTAL AND SOCIAL MANAGEMENT

3.1 OVERVIEW

3.1.1. The management of the Project will be guided by project-specific policies and procedures that provide a coherent and cohesive structure to the management of ESHS risks. Collectively, these will comprise the Project's and the various parties' respective Environmental and Social Management Systems (ESMSs). The key objectives of these systems are:

To ensure all activities and persons responsible anticipate and take action to avoid impacts or risks to communities and the environment or to reduce them to acceptable levels.

To help ensure that Rogun JSC and all contractor activities comply with the Applicable Standards.

To identify and assess E&S risks and impacts, both adverse and beneficial.

To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, to minimize, and, where residual impacts remain, to compensate or offset for risks and impacts to workers, affected communities, and the environment.

To promote and provide means for adequate engagement with affected communities throughout the Project life cycle on issues that could potentially affect them, and to ensure that relevant environmental and social information is disclosed and disseminated.

To ensure sufficient organizational capacity and competency exists at all levels within the Project's organization structure throughout the project lifecycle.

To set out a process for monitoring and review the effectiveness of the procedures and policies and to take steps to promote continual improvement.

To ensure that change is managed.

To set out formal reporting and documentation requirements, and responsible parties.

To set out a requirement for Management Review.

3.1.2. The management program will include a number of discrete management plans prepared by various parties to address the potential impacts their actions may cause. Plans to be developed by the various parties, as outlined in this ESMP, are illustrated in Figure 3-1.

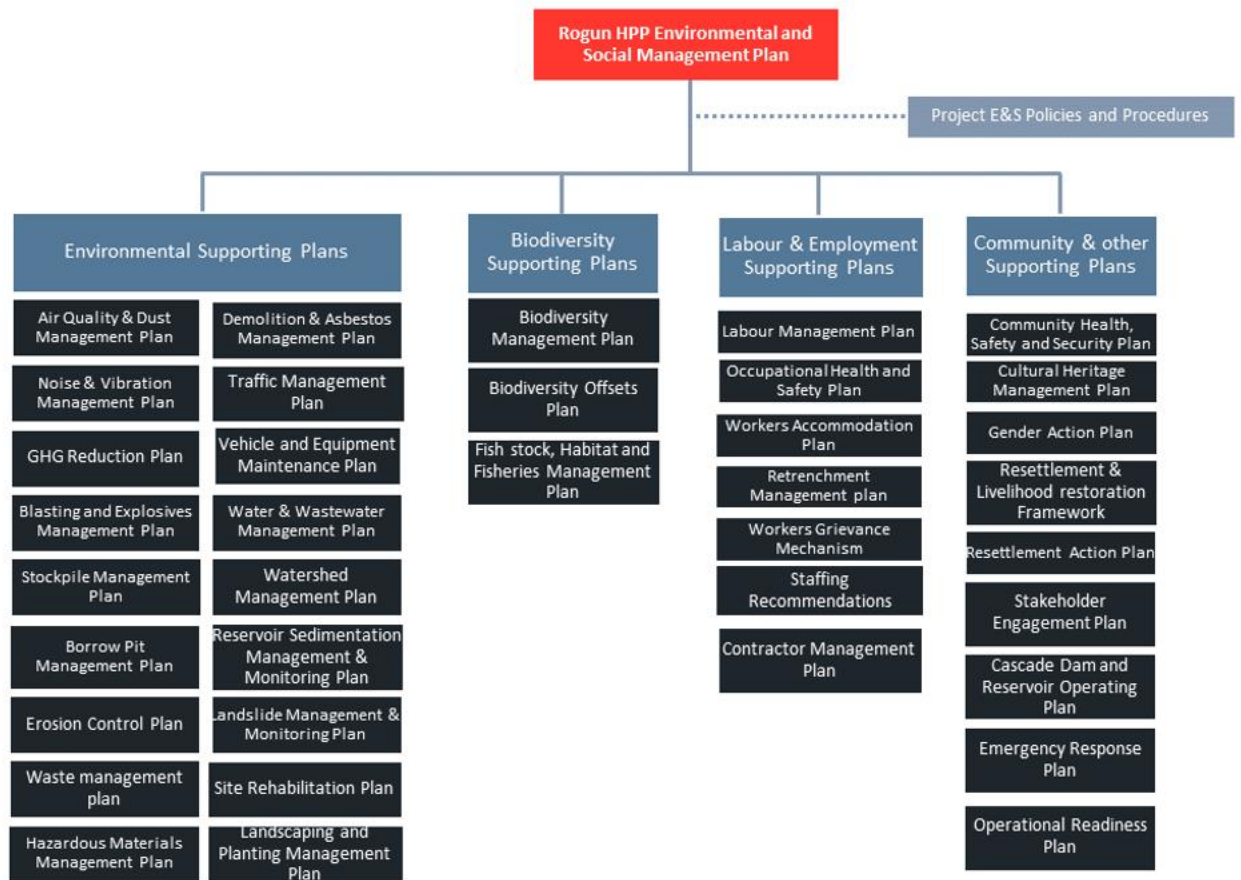


Figure 3-1 - Outline Project ESMP

- 3.1.4. Project procedures and policies will draw on the elements of the established business management process of implementing a Plan-Do-Check-Act (PDCA) cycle.
- 3.1.5. These policies and procedures, ESMP and supporting plans will be “live” documents and tools against which E&S performance can be monitored.
- 3.1.6. Continual improvement of these tools will be achieved through the continual assessment of E&S management performance against the relevant policies, objectives, and specific targets.

4 MANAGEMENT AND IMPLEMENTATION

4.1.1. As of March 2023, approximately 12,000 workers employed for construction and operation of the HPP and a few hundred for resettlement planning and implementation. This will rise to 15,000 to 20,000 in coming years. About 95 percent of the workforce is Tajik and the remainder expatriates. Construction of the HP will be complete in 2029, with the resettlement program continuing through at least 2032 and possibly slightly longer. The reservoir will reach full supply level in 2036.

4.1.2. The current organization will change when international financing becomes available for continued construction and operation.

4.1.3. The organizations currently responsible for ESHS management of the Project are presented in **Figure 4-1** and include:

- **Project Management Group (PMG) for Energy Facilities Construction under the President of Tajikistan (PMG)** coordinates the key parties involved in the Project, including liaison with international lenders.
- **Employer/Owner – OJSC Rogun HPP (Rogun JSC)** is responsible for ongoing and future operation of Rogun HPP and for ongoing construction of the HPP. Rogun JSC provides supervision of some construction contractors, including the Lot 3 EPC Contractor, Lot 4 early works contractors, other smaller contractors, and of the Employer’s Representative, Tractebel-ELC. Rogun JSC is ultimately accountable for all parties’ compliance with Tajikistan Law and, in future, International Standards.
- **Employer’s Representative – a consortium of Tractebel and ElectroConsult (Tractebel ELC or Tractebel)** provides supervision of the Lot 2 EPC Contractor, including construction and ESHS.
- **EPC Contractor for Lot 1: Voith Hydro GmbH & Co (Voith Hydro)** is responsible for delivery and installation of two runners for the two early generating units in 2024, installation of four new generating units from 2025 to 2029, an. installation of the balance of plant and control equipment. Voith Hydro will mobilize to site beginning in 2024.
- **EPC Contractor for Lot 2: WeBuild (formerly Salini Impregilo SpA)** is responsible for design, procurement, and construction of the coffer dam and main dam, including treatment of the dam base (salt layer, grout curtain, drainage curtain).
- **EPC Contractor for Lot 3: TajikGidroElectroMontazh (TGEM)** is responsible for tunnels and spillways on the right bank that provide adequate flood discharge capacity as the height of the main dam increases and lower tunnels can no longer be used for that purpose. Works under this contract that are not yet completed will be completed by a new Lot3A contractor (see below) and this contract will be terminated.
- **EPC Contractor for Lot 4** is to be appointed when financing is available, expected to be awarded in 2024. The contractor will be responsible for completion of left bank works.
- **Lot 4 ‘early works’ contractors:** two main contractors, **EMZ** and **Tunnel Sadd Ariana (Ariana)**, are implementing preparatory tunnelling and other works in advance of appointment of the Lot 4 EPC Contractor. Both contractors will be terminated and vacate the site upon appointment of the EPC Contractor. ESHS performance of the early works contractors is supervised by Rogun JSC.
- **Other non-EPC contractors** – A number of smaller contractors (approx. 20 plus) are undertaking various preparatory and maintenance works, including Lot 4 preparatory works.

Most of these contractors will also complete their work or have it taken over by EPC Contractors in 2024.

- **State Enterprise, Directorate of Flooding Zone of Rogun HPP (DFZ)** is responsible for developing and implementing the resettlement and livelihood restoration program, which is responsible for resettling over 46,000 people. DFZ employs two main contractors, one for construction at new resettlement sites and another for demolition of relocated villages. DFZ also employs the Forestry Agency within the Committee for Environmental Protection, which carries out land clearance works in advance of flooding, and another contractor that transports property of resettled households to designated resettlement sites. ESHS performance of DFZ's contractors ESHS performance is supervised by DFZ, which has no dedicated ESHS staff but does have engineering capability, including occupational health and safety. Contractors also have personnel (typically site managers) responsible for safety.

4.1.4. A new organizational structure for Rogun HPP will prevail once there is a commitment to international financing which is expected in 2024 (See **Figure 4-2**). The changes will include:

In preparation of financing, PMG will modify the existing Lots 1 and 2 EPC contracts as needed to include ESHS requirements equivalent to those required by World Bank Standard Procurement Documents (SPD) for civil works. PMG has appointed Mott MacDonald to develop and negotiate modifications for Lots 1 and 2 (but not yet for DFZ contracts). PMG will execute the modifications as soon as practicable after financing is available.

Also, in preparation of financing, PMG is tendering and selecting EPC contractors for Lots 3A and 4, which will be awarded as soon as practicable after financing is available. As noted, Lot 3A will include all works not yet completed by TGEM and Lot 4 will include all remaining left bank works. The Lot 3 EPC contract, early works contracts, and other contracts for works not assumed by Lot 3A and Lot 4 EPC Contractors will be terminated, and the contractors will demobilize and leave the site. The current Employers Representative, which is responsible only for Lot 2 at present, will be replaced a Project Management Consultant (PMC). The PMC will supervise engineering and ESHS performance of all four EPC contractors, and any other lesser contractors who remain on the site.

4.1.5. Similarly, DFZ will modify its construction contracts to include appropriate ESHS requirements and will take an active role in managing ESHS performance.

Figure 4-1 Current Organizational Structure

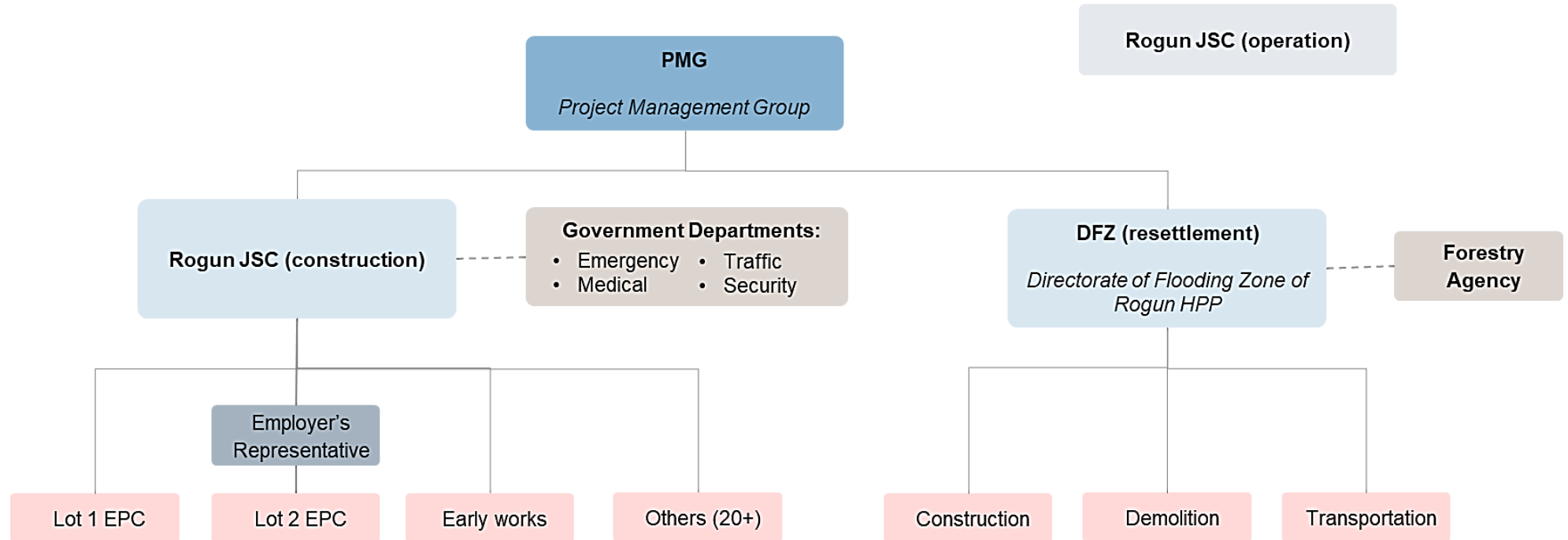
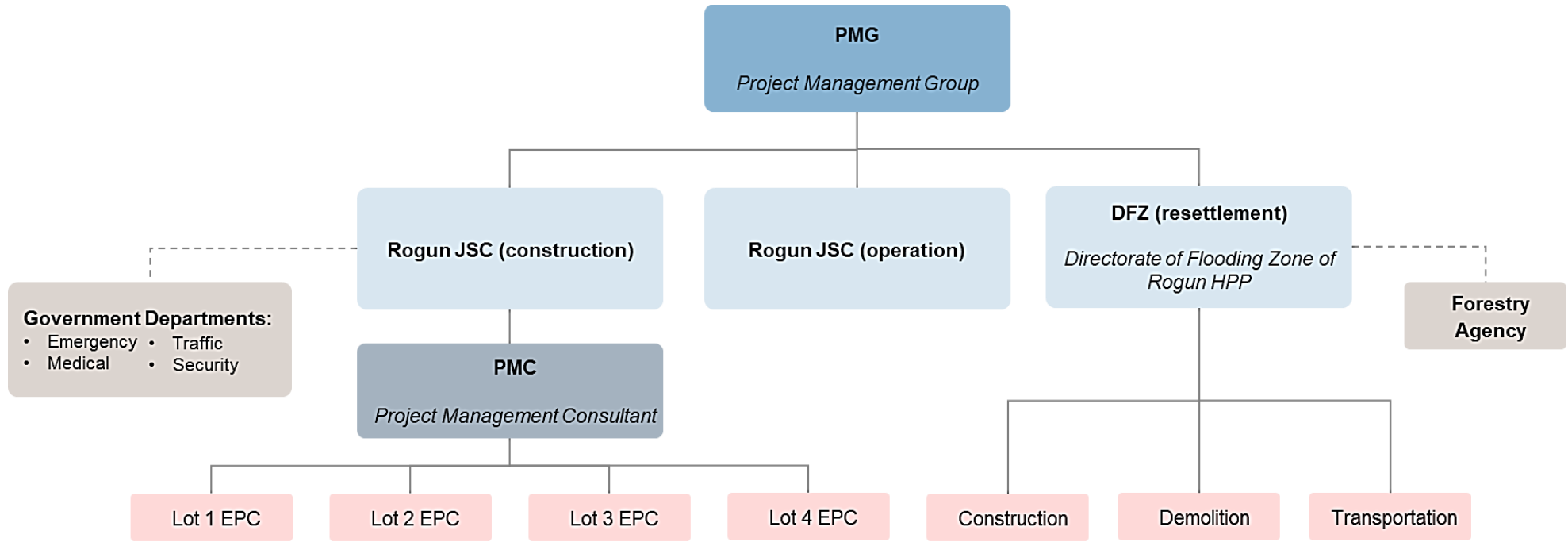


Figure 4-2 Future Organizational Structure



5 ENVIRONMENTAL AND SOCIAL MANAGEMENT

- 5.1.1. The Project has, as part of the lender process, conducted a standalone ESIA which is additional to the Government of Tajikistan regulatory environmentally permitting requirements. The ESMP incorporates all mitigation measures identified within this ESIA.
- 5.1.2. Enhancement measures may also be identified to increase the positive benefits generated by the Project. The summary of mitigation measures is presented in **Table 5-1**.
- 5.1.3. The Project and EPC contractor(s) will develop the additional management plans as set out in **Figure 3-1**, continue engaging with its key stakeholders around the Project, its impacts and mitigation measures whilst addressing grievances submitted.
- 5.1.4. The Project will also undertake monitoring activities during the construction phase and oversee the implementation of the Project’s E&S commitments. These will be incorporated and continuously updated.
- 5.1.5. The ‘effective date’ is the date when the agreement and transaction become legally binding, and the terms outlined in the contract begin to apply.

Table 5-1 Mitigation Measures

#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe
1. Procurement and Project Preparation							
1	Construction contracts	<ul style="list-style-type: none"> ▪ Lot 1 contract ▪ Lot 2 contract ▪ DFZ contracts 	Unacceptable ESHS impacts.	<ul style="list-style-type: none"> ▪ Modification of existing EPC and DFZ contracts to include ESHS requirements consistent with World Bank World Bank Standard Procurement Documents (SPDs), including relevant requirements (that is, relevant to the contractor’s activities) of Chapter 8, ESMP, SEP, LMP, GAP, etc.) ▪ Negotiations and agreement with EPC Contractors 	Contracts with appropriate ESHS requirements	<ul style="list-style-type: none"> ▪ PMG and JSC Rogun (in part through Mott MacDonald) ▪ DFZ 	<ul style="list-style-type: none"> ▪ Modified contracts agreed by parties: within 30 days of WB Board approval. ▪ Modified contracts executed: within 30 days after effective date.



#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe
				<ul style="list-style-type: none"> ▪ Execution of modified contracts 			
2	Bidding documents	<ul style="list-style-type: none"> ▪ Lot 3A contract ▪ Lot 4 contract ▪ New DFZ contracts 	Unacceptable ESHS impacts.	<ul style="list-style-type: none"> ▪ As required by SPDs, include relevant requirements for ESHS documentation and performance (from ESIA & ESMP, SEP, LMP, ESCP, GAP) in bidding documents for construction contracts. ▪ Require proposals to include: <ul style="list-style-type: none"> ○ Management Strategies and Implementation Plan (MSIP) for management manage risks of preconstruction phase (design and construction of camps, warehouses, workshops, site preparation, etc.), including: <ul style="list-style-type: none"> ○ OHS ○ Labor management ○ Worker COC and GRM ○ Hazmat management ○ Air quality/dust ○ Layout of site(s) ○ Construction standards for accommodations/ workshops, etc. ○ ESHS key personnel for the project (that is, not corporate level):ESHs manager, OHS manager, environmental manager, labor manager, ESHS specialists, at least one safety officer per 50 workers ▪ ESHS Performance Security of at least one percent of the total contract value ▪ Minimum acceptable score for ESHS (pass/fail) 	Contracts with appropriate ESHS requirements.	<ul style="list-style-type: none"> ▪ PMG ▪ JSC Rogun 	<ul style="list-style-type: none"> ▪ Tendering prior to World Bank Board approval. ▪ Contracts negotiated within 60 days of WB Board approval. ▪ Contracts awarded before effective date.



#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe
				<ul style="list-style-type: none"> MSIP and key personnel considered in evaluation factors for award. ESHS specialist briefs evaluation panel on ESHS scoring. ESHS specialist(s) appointed as member of evaluation panel 			
3	Cleanup standards	<ul style="list-style-type: none"> Lot 3 contract Non-EPC contracts 	Contamination of reservoir (2027)	As needed, modification of contracts to include standards for cleanup and site rehabilitation prior to demobilization.	<ul style="list-style-type: none"> Contracts with cleanup standards No contamination of reservoir 	JSC Rogun and PMG	<ul style="list-style-type: none"> Contracts modified: within 30 days after effective date
4	Primary supplier contracts	<ul style="list-style-type: none"> Lot 1 – 4 EPC Contractors plus TGM DFZ contractors (if primary supplier identified in future) 	Risk to primary supply workers	<ul style="list-style-type: none"> Primary suppliers (of concrete and steel liners) to complete labor management declaration form (see LMP). If unsatisfactory response, confirm modification of supplier labor practices or change of supplier. If no response, identify alternative source. PMC to verify 	<ul style="list-style-type: none"> Contracts with appropriate requirements. Primary suppliers in compliance (workers protected) 	EPC Contractors (supervised by PMC) and TGM (supervised by JSC Rogun)	<ul style="list-style-type: none"> Prior to effective date
5	PMC Contract	All contractors	<ul style="list-style-type: none"> Contractor ESHS performance not supervised. Unacceptable impacts 	<ul style="list-style-type: none"> TOR to include requirement to supervise non-EPCs until demobilized. PMC appointed 	PMC contract includes non-EPC supervision	Modify TOR, select and award contract: PMG and JSC Rogun	<ul style="list-style-type: none"> TOR modified: prior to tendering. PMC appointed: within 30 days of WB Board approval
6	DFZ construction and demolition contracts	DFZ Contractors	Unacceptable impacts	<ul style="list-style-type: none"> Modification to contracts to include relevant requirements from Chapter 8 and ESMP, SEP, LRPF, LMP, GAP 	<ul style="list-style-type: none"> Contracts with appropriate requirements 	PMG and DFZ	<ul style="list-style-type: none"> Contracts modified: 90 days after effective date

#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe
					<ul style="list-style-type: none"> No unacceptable impacts 		
7	Preparation for ESHS management	All parties	<ul style="list-style-type: none"> Insufficient ESHS staffing Poor ESHS management Unacceptable impacts 	Appointment of ESHS managers, specialists, and staff in accordance with section 7 below.	<ul style="list-style-type: none"> Adequate staffing ESHS management 	<ul style="list-style-type: none"> PMG JSC Rogun DFZ Contractors 	<ul style="list-style-type: none"> PMG, JSC Rogun, DFZ: 180 days after effective date Contractors: before preconstruction and mobilization
2. Demobilization of Contractors							
2a. Remediation							
8	e Remedial planning for contaminated areas (camps, workshops, etc.) to be inundated	<ul style="list-style-type: none"> Construction camp 1 Right bank and left bank 1110 inundation zone 	Contamination of reservoir	<ul style="list-style-type: none"> Inspection to identify contaminated areas, including asbestos in construction and wastes Identification of repository for contaminated material, including asbestos Development and approval of cleanup plans 	<ul style="list-style-type: none"> ID areas of concern Approved decontamination/containment 	<ul style="list-style-type: none"> Inspection/ID: JSC Rogun Repository/ies identified/developed: JSC Rogun (with CEP) Plan development: JSC Rogun, Contractors Plan approvals: JSC Rogun, PMC, CEP 	<ul style="list-style-type: none"> Inspection: prior to WB Board approval. Cleanup plans: see row 17.
2b. Contamination							
9	Cleanup of Construction Camp 1.	Reservoir	Contamination of reservoir	<ul style="list-style-type: none"> Camps/facilities/accommodations/etc. cleared in accordance with cleanup plans. Cleanup verified by inspection. Site accepted for handover. 	<ul style="list-style-type: none"> Decontamination/containment No contamination of reservoir 	<ul style="list-style-type: none"> Sites cleared: Lot 3 EPC and non-EPCs and JSC Rogun Verification and acceptance: JSC Rogun and CEP 	<ul style="list-style-type: none"> Cleared: within 90 days of effective date (repeated until verified) Verification: 15 days after clearance



#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe
							<ul style="list-style-type: none"> Handover: within 180 days after effective date
10	Cleanup of working area on left bank.	Reservoir	Contamination of reservoir (2027)	<ul style="list-style-type: none"> Contamination cleared or contained in accordance with cleanup plans. Removal of all facilities and equipment Verification/acceptance of clearance 	<ul style="list-style-type: none"> Removal/ decontamination No contamination of reservoir 	<ul style="list-style-type: none"> Sites cleared/ contained: Lots 2 & 3 EPCs, non-EPCs. Verification: JSC Rogun and CEP 	<ul style="list-style-type: none"> Cleared: within 90 days of effective date (repeated until verified) Verification: 15 days after clearance Handover: within 180 days after effective date
11	Cleanup of Rogun JSC areas to be inundated	Reservoir	Contamination of reservoir (2027)	<ul style="list-style-type: none"> Removal of contaminated materials/decontamination Removal of all facilities and equipment Verification/acceptance of clearance 	<ul style="list-style-type: none"> Removal/ decontamination, site clearance No contamination of reservoir 	<ul style="list-style-type: none"> Sites cleared/ contained: JSC Rogun: Verification: CEP 	<ul style="list-style-type: none"> Cleaned: within 120 days of effective date (repeated until verified) Verification: 15 days after clearance
12	Clearance of resettled villages	Reservoir	Contamination of reservoir	<ul style="list-style-type: none"> Removal/Decontamination of septic systems/ latrines Demolition of structures, removal of debris Authorization to remove debris and demobilize for site. <p>Note: no significant change from present course</p>	<ul style="list-style-type: none"> No contamination of reservoir 	<ul style="list-style-type: none"> Removal/demolition: DFZ demolition contractor Release: DFZ and CEP 	<ul style="list-style-type: none"> As required by CEP
2c. Asbestos							
13	Identification of asbestos sitewide	Lots 1-4 EPC Contractors	Exposure to asbestos	<ul style="list-style-type: none"> Investigate to identify any presence / potential presence of asbestos sitewide and at all resettlement sites—see row 8 Production of Asbestos Register 	<ul style="list-style-type: none"> ID areas of concern 	<ul style="list-style-type: none"> Inspection: JSC Rogun 	<ul style="list-style-type: none"> See row 8.
3. ESHS Management Planning							



#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe
3a. Update Management Plans							
14	PMG and JSC Rogun ESHS Management Plans	<ul style="list-style-type: none"> ▪ EPC Contractors ▪ Communities ▪ Environment 	<ul style="list-style-type: none"> ▪ Ineffective ESHS management ▪ Unacceptable impacts 	Development and implementation of ESHS management plans: <ul style="list-style-type: none"> ▪ Stakeholder engagement and GRM ▪ Biodiversity management and No net Loss Plan ▪ Labor Management Plan including worker GRM and COC ▪ Community health, safety, security Plan ▪ Cultural heritage management plan and chance finds procedure. ▪ Gender action plan ▪ Fish stock, habitat, and fisheries plan 	<ul style="list-style-type: none"> ▪ Effective ESHS management ▪ No unacceptable impacts 	PMG and JSC Rogun	<ul style="list-style-type: none"> ▪ Plans and guidelines disclosed prior to or WB Board review. ▪ Implementation: after effective date
3b. Standards & Guidelines							
15	PMG and JSC Rogun EPC Contractor Guidelines and Standards	Lots 1-4 EPC Contractors	<ul style="list-style-type: none"> ▪ Ineffective planning ▪ Poor performance ▪ Unacceptable impacts 	Development of guidelines (to include standards and minimum requirements) and plans for Contractor ESHS program/plans to manage: <ul style="list-style-type: none"> ▪ OHS ▪ Labor, including GRM and COC ▪ Traffic ▪ Erosion control ▪ Materials and wastes ▪ Emergency preparedness/response ▪ ESHS training, including SEA/SH/GBVAccommodations ▪ Air quality/dust ▪ Water/wastewater 	<ul style="list-style-type: none"> ▪ Effective management programs ▪ No unacceptable impacts 	PMG and JSC Rogun (through Tractebel and/or PMC)	<ul style="list-style-type: none"> ▪ Guidelines developed and approved: prior to effective date: . ▪

#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe
				<ul style="list-style-type: none"> ▪ Noise and vibration ▪ Explosives and blasting 			
16	DFZ contractor ESHS Guidelines	<ul style="list-style-type: none"> ▪ Resettled households ▪ Construction contractor ▪ Responsible ministries 	<ul style="list-style-type: none"> ▪ Noncompliant housing/ infrastructure ▪ Unacceptable construction impacts 	<ul style="list-style-type: none"> ▪ Development of guidelines (standards and minimum requirements) for contractor plans to manage: <ul style="list-style-type: none"> ○ OHS ○ Air quality/dust ○ Labor ○ Drainage ○ Worker GRMs ○ Emergency response ○ Waste ▪ Requirements imposed on resettled households for construction of new houses to meet Tajik building standards. ▪ Infrastructure required to be designed and constructed in compliance with Tajik building standards 	<ul style="list-style-type: none"> ▪ Contractors aware of responsibilities ▪ Safe and stable houses ▪ Safe and stable infrastructure 	<ul style="list-style-type: none"> ▪ Guidelines: DFZ ▪ House building requirements: DFZ to impose requirements. ▪ Infrastructure requirements: DFZ to collaborate with Ministries 	<ul style="list-style-type: none"> ▪ Guidelines: 30 days after WB Board approval ▪ Requirements on resettlers: 30 days after effective date. ▪ Infrastructure: 30 days after effective date
3c. New Management Plans/Strategies							
17	ESHS Program Update	Lot 2 EPC	Substandard ESHS management Unsafe conditions	<ul style="list-style-type: none"> ▪ New program/plans or modifications to existing ESHS plans to be developed in accordance with JSC Rogun guidelines (see row 15), including: <ul style="list-style-type: none"> ○ Occupational Health, Safety, and Security Plan ○ Labor Management Plan, including Workers GRM and CoC ○ Workers Accommodation Plan ○ Retrenchment Management Plan ○ Subcontractor Management Plan 	<ul style="list-style-type: none"> ▪ Effective ESHS controls during construction 	<ul style="list-style-type: none"> ▪ Plan changes: Lot 2 EPC Approval: PMC 	<ul style="list-style-type: none"> ▪ New/Proposed changes: within 3 days after contract modification (see row 1) ▪ Plans approved: within 6 months of effective date (when acceptable)



#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe
				<ul style="list-style-type: none"> ○ Traffic Management Plan ○ Erosion Control Plan ○ Waste Management Plan ○ Emergency Preparedness & Response plan ○ ESHS training ○ Air Quality & Dust Management Plan ○ Water & Wastewater Management Plan ○ Noise & Vibration Management Plan ○ Blasting & Explosives Management Plan ○ ○ Borrow Pit/Quarry Management Plan ○ Demolition & Asbestos Management Plan ○ Stockpile Management Plan ○ Site Rehabilitation and Demobilization Plan ○ ○ Hazardous Materials Management Plan ○ Site Rehabilitation and Demobilization Plan ○ GHG Reduction Plan ○ Vehicle & Equipment Maintenance Plan <p>Plans to require mitigation in accordance with Volume 1, Chapter 8 and guidelines in row 16</p>			

#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe
4. Preconstruction and Construction Phase							
18	Land allocation for camps	Lots 1, 3A, and 4 EPC Contractors	Exposure of workers to contamination	<ul style="list-style-type: none"> Verification that previously used land has been cleared and released (see above) Allocation of land for shops/accommodations/facilities 	Uncontaminated land, suitable for facilities	<ul style="list-style-type: none"> Verification: JSC Rogun and CEP Allocation: JSC Rogun 	<ul style="list-style-type: none"> Verification: 15 days after clearance Allocation: immediately after verification
19	Preconstruction phase (contractor facility/site preparation)	Lots 1, 3A, and 4 EPC Contractors	<ul style="list-style-type: none"> Substandard ESHS management Unsafe conditions Air, water, soil pollution 	<ul style="list-style-type: none"> If needed, modifications to MSIP to fully address risks during pre-construction phase. Pre-construction-phase mobilization authorization MSIP implemented (dust, drainage, hazmats, land-clearing, traffic, safety, etc.) Accommodations designed and constructed to meet IFC/EBRD guidelines. Workshops, warehouses, etc., designed and constructed to meet international standards. Development of ESHS management program/plans in accordance with JSC Rogun guidelines (see row 15), to cover, as needed, : 	<ul style="list-style-type: none"> MSIP addresses all pre-construction phase risks. No unacceptable risks and impacts to workers, community, or environment. Effective ESHS controls during construction 	<ul style="list-style-type: none"> MSIP change requirements: JSC Rogun MSIP changes: EPC Contractors MSIP final approval: PMC¹ Design and construction: EPCs Plan preparation: EPCs Plans approved: PMC. 	<ul style="list-style-type: none"> MSIP changes: within 30 days after appointment Preconstruction mobilization: after MSIP approved. Implementation: throughout preconstruction phase ESHS plans prepared: 30 days after preconstruction mobilization Plans approved: TBD (when acceptable)—prior to mobilization for construction

¹ If there are delays in PMC appointment prior to mobilization of Contractors, JSC Rogun may require Tractebel to assume PMC responsibilities until the appointed PMC can assume its responsibilities.



#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe
				<ul style="list-style-type: none"> ○ Occupational Health, Safety, and Security Plan ○ Labor Management Plan, including Workers GRM and CoC ○ Workers Accommodation Plan ○ Retrenchment Management Plan ○ Subcontractor Management Plan ○ Traffic Management Plan ○ Erosion Control Plan ○ Waste Management Plan ○ Emergency Preparedness & Response plan ○ ESHS training ○ Air Quality & Dust Management Plan ○ Water & Wastewater Management Plan ○ Noise & Vibration Management Plan ○ Blasting & Explosives Management Plan ○ Borrow Pit/Quarry Management Plan ○ Demolition & Asbestos Management Plan ○ Stockpile Management Plan ○ Site Rehabilitation and Demobilization Plan ○ Hazardous Materials Management Plan ■ Plans to require mitigation in accordance with Volume 1, Chapter 8. 			



#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe
				<ul style="list-style-type: none"> ▪ Plans to identify mitigations to be applied (see Volume 1, Chapter 8), locations, responsibilities, frequencies, etc.), ▪ Plans approved 			
20	ESHS Program Update	Lot 2 EPC	Substandard ESHS management Unsafe conditions Air, water	<ul style="list-style-type: none"> ▪ As needed, new program/plans or modifications to existing ESHS plans for: <ul style="list-style-type: none"> ○ OHS ○ Labor, including GRM and COC ○ Traffic ○ Erosion control ○ Materials and wastes ○ Emergency preparedness/response ○ ESHS training ○ Accommodations ○ Air quality/dust ○ Water/wastewater ○ Noise and vibration ▪ Explosives and blasting ▪ Plans approved 	Effective ESHS controls during construction	<ul style="list-style-type: none"> ▪ Plan changes: Lot 2 EPC ▪ Approval: ER/PMC 	<ul style="list-style-type: none"> ▪ New/Proposed changes: within 30 days after contract modification (see row 1) ▪ Plans approved: within 6months of effective date
21	PMC Mobilization	PMC and Contractors	<ul style="list-style-type: none"> ▪ Poor ESHS performance ▪ Unacceptable impacts 	<ul style="list-style-type: none"> ▪ Mobilize to site. ▪ Review and approval of Contractor ESHS management programs/plans 	<ul style="list-style-type: none"> ▪ Contractor ESHS performance supervised. ▪ Contractor compliance with ESHS standards 	PMC	<ul style="list-style-type: none"> ▪ Mobilization: as specified in TOR (to overlap Tractebel)

#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe
22	ESHS Supervision	EPC and DFZ Contractors	<ul style="list-style-type: none"> Ineffective ESHS management Unacceptable ESHS impacts 	<ul style="list-style-type: none"> Approval of EPC Contractor management program/plans Supervision of ESHS performance Employment of Ecological Clerk of Works. Enforcement of ESHS requirements in contracts and application of remedies (warnings, written notices, removal, suspension, withholding of payment, etc.) in accordance with contracts 	<ul style="list-style-type: none"> Contractor compliance ESHS management programs implemented 	<ul style="list-style-type: none"> EPCs: PMC DFZ contractors: DFZ 	<ul style="list-style-type: none"> Approval: within 30 days of effective date Supervision and enforcement: throughout pre-construction and construction
4a. Mitigation							
23	Reservoir Instability Risks	<ul style="list-style-type: none"> Reservoir 	<ul style="list-style-type: none"> Slope instability risks Landslides 	<ul style="list-style-type: none"> Investigate and survey the banks of the reservoir to establish slopes at risk of instability due to the varying water levels. Undertake intervention works to stabilize the slopes where possible. 	<ul style="list-style-type: none"> No unacceptable impacts 	<ul style="list-style-type: none"> Rogun JSC 	<ul style="list-style-type: none"> Investigation: within 3 months of effective date.
24	Soil Conservation	<ul style="list-style-type: none"> Environment 	<ul style="list-style-type: none"> Loss of soil 	<ul style="list-style-type: none"> All new land-clearing and land disturbing activities kept to a minimum. Before inundation, former arable land should be made available to communities to recover topsoil for use elsewhere. As per mitigation in accordance with Volume 1, Chapter 8. 	<ul style="list-style-type: none"> No unacceptable impacts 	<ul style="list-style-type: none"> Rogun JSC 	<ul style="list-style-type: none"> Implementation: within 3 months of effective date.
5. Construction							
25	Contractor Mobilization	EPC and DFZ Contractors	<ul style="list-style-type: none"> Project delays 	<ul style="list-style-type: none"> Mobilization of equipment and workers 	<ul style="list-style-type: none"> Effective ESHS controls No unacceptable impacts 	<ul style="list-style-type: none"> Approval and authorization for EPCs: PMC 	<ul style="list-style-type: none"> Mobilization: after ESHS plans approved.



#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe
			<ul style="list-style-type: none"> ▪ Ineffective ESHS controls ▪ Unsafe conditions ▪ Unacceptable impacts on workers, communities, environment 			<ul style="list-style-type: none"> ▪ Mobilization: Contractors 	
26	Construction (and demolition)	Contractors	<ul style="list-style-type: none"> ▪ Poor ESHS management ▪ Unacceptable impacts 	Implementation of management program/plans (see rows 19 and 20)	<ul style="list-style-type: none"> ▪ Ineffective ESHS management ▪ Unacceptable impacts 	<ul style="list-style-type: none"> ▪ EPC and DFZ Contractors 	<ul style="list-style-type: none"> ▪ Throughout mobilization and construction (and demolition)
27	ESHS supervision	See row 22					
6. HPP Operation							
28	Update of studies	Rogun HPP	<ul style="list-style-type: none"> ▪ No recognition of risks ▪ Inefficient operation 	Appoint consultants to complete studies to update information on seismicity, climate/hydrology, and sedimentation	<ul style="list-style-type: none"> ▪ Improved understanding and mitigation of risks ▪ Efficient operation 	<ul style="list-style-type: none"> ▪ JSC Rogun 	<ul style="list-style-type: none"> ▪ TBD
29	ESHS Planning	<ul style="list-style-type: none"> ▪ Workers ▪ Communities ▪ Environment 	<ul style="list-style-type: none"> ▪ Poor ESHS management ▪ Unacceptable impacts 	<ul style="list-style-type: none"> ▪ Update current program/plans and/or develop new program/plans for: <ul style="list-style-type: none"> ○ ESHS Policy Statement ○ OHS ○ Labor, including GRM and COC ○ Waste and materials management 	<ul style="list-style-type: none"> ▪ Effective ESHS management ▪ No unacceptable impacts 	<ul style="list-style-type: none"> ▪ Development: JSC Rogun ▪ Approval: WB (Lender) 	<ul style="list-style-type: none"> ▪ Plans developed: 90 days after effective date. ▪ Plans approved: when acceptable



#	Activity or Issue	Receptor	Potential Adverse Effects	Mitigation Measures /Enhancement	Indicators / Target Outcome	Responsible Body	Indicative Timeframe	
				<ul style="list-style-type: none"> ○ Air quality (underground) ○ Watershed management ○ Emergency planning and response ▪ Plans are to become part of the Cascade dam and reservoir operating plan. ▪ Approval of program/plans 				
30	ESHS Implementation			Implementation of management plans, including: <ul style="list-style-type: none"> ▪ Program/plans in row 29 ▪ Plans from row 14 (SEP, GAP, BMP and No Net Loss, Fisheries) 			<ul style="list-style-type: none"> ▪ Row 24 plans: after approval, throughout operation ▪ Row 12 plan: after effective date, throughout operation 	
7. Resettlement Program								
31	RPF	Current and future resettlers	Resettlers worse off than before	Completion of updated LRPF	<ul style="list-style-type: none"> ▪ Compliance with ESS5 ▪ Resettlers no worse off 	<ul style="list-style-type: none"> ▪ DFZ 	<ul style="list-style-type: none"> ▪ Prior to WB board approval 	
32	RAP 2	Ongoing resettlement program		<ul style="list-style-type: none"> ▪ Completion of updated RAP2 ▪ Implementation of RAP2 ▪ Completion audit in accordance with LRPF 			<ul style="list-style-type: none"> ▪ DFZ 	<ul style="list-style-type: none"> ▪ Updated RAP2: Before effective date ▪ Implementation: through 2025 ▪ Completion audit: in accordance with RAP2
33	RAP 3, 4, <i>et al.</i>	Future resettlement program		Development and implementation of future RAPs in accordance with RPF			<ul style="list-style-type: none"> ▪ DFZ 	<ul style="list-style-type: none"> ▪ In accordance with LRPF

6 MONITORING

- 6.1.1. Monitoring of the effects of construction and operational activities on workers, communities, and the environment will enable the effectiveness of ESHS mitigation to be evaluated and improved. Supervision by the PMC and by DFZ will verify that contractors are complying with the ESHS requirements of their contracts and their management programs and plans or allow actions to bring them back into compliance.
- 6.1.2. JSC Rogun's ESHS management plans (see rows 14 and 29 in **Table 5-1**) will establish requirements for monitoring, including what is to be monitored, how it will be monitored, where and when monitoring will take place, who will conduct the monitoring, and what records will be kept of monitoring results. The plans will also specify response actions for conditions or actions that are not in compliance with the ESCP and/or approved management plans.
- 6.1.3. It is not possible at this stage to define contractors' monitoring requirements with any precision. That will be defined in JSC Rogun's management plan guidelines (see row 15 the contractors' ESHS management plans (see rows, 19 and 20 in **Table 5-1**), which will have to be approved by the PMC (acting on behalf of JSC Rogun and PMG). The management plans will requirements for what is to be monitored by the contractor, how it will be monitored, where and when monitoring takes place, who will conduct the monitoring, and what records will be kept of monitoring results. The plans will also specify response actions for conditions or actions that are not in compliance with contracts and/or approved management plans.
- 6.1.4. Monitoring will range from more or less continuous observation of site conditions (e.g., visible dust (aboveground) or haze (belowground), safety of working conditions, vehicle conditions, etc.) by ESHS managers and staff as well as site managers and supervisors to scheduled or unscheduled inspections (e.g., of workplace safety or of drainage control) to measurements of specific parameters (e.g., atmospheric gasses) by specialists to continuous recording of various parameters/conditions. Monitoring may also include interviews with workers or supervisors and/or review of records. Each management plan will specify the multiple methods that will be used (see

- 6.1.5. **Table 6-1** for examples) and the frequency of monitoring. If possible, the PMC and possibly contractors will use the CCTV system operated by JSC Rogun to enhance their monitoring capabilities.
- 6.1.6. In addition to the “self-monitoring” by JSC Rogun and Contractors that is required by their management plans, the PMC will supervise EPC Contractor ESHS performance and compliance with ESHS requirements of their Contracts and DFZ will monitor its contractors’ ESHS performance and compliance with their contracts.
- 6.1.7. Actions arising from all inspections will be collated into a centralized Corrective Action Register (CAR) for monitoring follow up and close out of the findings of the inspection. Instances of noncompliance will be addressed as described in contracts and in section 9 below. The CAR will be reviewed monthly as part of ESHS progress meetings, and the closeout rate will be monitored during weekly ESHS meetings.

Table 6-1 Monitoring Program to be Defined in Management Plan

Type of Monitoring	Objective	Responsible party	Approximate Frequency	Output
Continuous observation	Identify issues of concern (visible dust, unsafe conditions)	All parties: <ul style="list-style-type: none"> Site managers Supervisors ESHS managers and staff PMC 	Continuous	<ul style="list-style-type: none"> Issues recorded/ reported as appropriate. Actions taken
OHS routine workplace inspection	Targeted inspection of work practices and conditions	<ul style="list-style-type: none"> Contractors' site managers Contractors' ESHS managers Contractors' safety managers and officers PMC 	Daily (selected locations)	<ul style="list-style-type: none"> Conditions/ practices observed. Improvements needed. Actions taken.
Routine environmental site inspection	Targeted inspection of implementation and effectiveness of mitigation measures	<ul style="list-style-type: none"> Contractors' site managers Contractors' ESHS managers and specialists PMC 	Occasional Weekly Daily	<ul style="list-style-type: none"> Environmental inspection register Actions taken.
Routine labor inspection	Assess labor management practices	<ul style="list-style-type: none"> Contractors' HR managers and specialists PMC 	Weekly spot checks, records reviews	<ul style="list-style-type: none"> Labor register Actions taken
Security Inspection	Assess Security Management and practices	<ul style="list-style-type: none"> ESHS managers PMC 	Weekly	<ul style="list-style-type: none"> Security inspection register Actions taken
Routine accommodation and amenities (kitchens, sanitation, etc.) Inspection	Condition of workers' accommodations	<ul style="list-style-type: none"> Contractors' HR specialists PMC 	Weekly.	<ul style="list-style-type: none"> Accommodation inspection checklist. Actions taken

7 TRAINING, AWARENESS AND COMPETENCE

- 7.1.1. All personnel employed or visiting Project sites will be trained on relevant ESHS topics, including the jobs or activities they are to perform, the risks and impacts their actions may cause, and the measures they and others must take to avoid or minimize the ESHS risk and impacts.
- 7.1.2. The PMC will develop and provide induction training to all who visit the HPP construction site and the DFZ or their contractors (as required by DFZ) will develop and provide such training to those who visit DFZ construction or demolition sites. Each management plan developed by Contractors and JSC Rogun (see **Figure 3-1**) will include requirements for training site managers, ESHS managers and specialists, and supervisors and others who may be exposed to or cause risks and impacts.
- 7.1.3. Training will include formal training sessions as well as regular “toolbox talks” undertaken prior to commencement of daily construction activities. All training will be documented, including the topic, trainees, trainer, location, date, and time of each session. Some training, such as for drivers or blasters, may require issuance of a certificate or license.
- 7.1.4. Induction training will include, but not necessarily limited to:
- Definition of the environment.
 - Need for environmental protection and management.
 - Impact of construction activities on the environment.
 - Adequate mitigation measures against such impact.
 - Emergency Preparedness and Response Plan.
 - Code of Conduct and social responsibility during construction, such as being considerate to local communities, community health, with a focus on the prevention of sexually transmitted infections, and gender specific requirements.
 - Project policies and objectives.
 - The Project ESMP.
 - Health and safety plans and procedures.
 - Key occupational health and safety (OHS) hazards and controls on site.
 - Current applicable regulations.
 - Grievance mechanisms.
- 7.1.5. Additional specialist training will be provided as needed, including as required by Tajik regulatory requirements, to ensure understanding and effective implementation of Project ESHS requirements.

8 MANAGEMENT OF CHANGE

- 8.1.1. An effective change management will underpin every element of the Project's management systems. This includes a number of elements that are specifically designed to check and identify changes in E&S performances, risk profile, and management effectiveness in order to ensure that issues are recognized and that actions are taken to address the issues, including changes to the systems.
- 8.1.2. This ESMP as well as the management plans prepared by JSC Rogun and contractors are intended to be "live" documents that will be revised, revised, and updated on a regular basis to ensure they remain relevant and are effectively mitigating the risks identified in this ESIA and during Project performance.
- 8.1.3. JSC Rogun will review and, if necessary, update its management plans on an annual basis. Changes will be submitted to and approved by the World Bank and/or other Lenders as appropriate.
- 8.1.4. Construction contractors, both EPC Contractors and DFZ's contractors, will review and update their plans on a semi-annual basis (that is, twice per year) or as required by the PMC or DFZ, respectively. Changes will be submitted for review and approval by the PMC or DFZ, as appropriate,
- 8.1.5. This ESMP will be reviewed and updated by PMG on at least a bi-annual basis. If there are material changes to Tajikistan legal requirements or Lender requirements, the ESMP will be updated within 90 days of the changes.

9 INCIDENTS, NON-CONFORMANCES, AND CORRECTIVE ACTIONS

- 9.1.1. If monitoring observations, inspections, or reviews of records (by the Contractor or by the PMC or DFZ) reveal that Contractors or others are not complying with applicable requirements, including ESHS requirements of the contract and approved management plans, this will be documented and followed up until there are satisfactory responses and compliance. Instances of noncompliance with ESHS requirements will be addressed immediately or as soon as practicable, with required response actions commensurate to the risk of the nonconformance (which could range from simple non-use of proper PPE to life-threatening misuse of equipment).
- 9.1.2. All but the most minor instances of noncompliance will be documented and repeat violations will always be documented. All parties (that is, PMC, DFZ, and Contractors) will implement a graduated system of penalties for workers and contractors who repeatedly violate ESHS requirements, including proper use of PPE. The process shall begin with verbal warning, proceeding to written notice, and continuing through dismissal of personnel for repeated violations.
- 9.1.3. Similarly, a graduated system of penalties should be applied to supervisors and managers, and to companies, if there are repeated instances of safety or other violations or issues associated with work or workers under their supervision.
- 9.1.4. To ensure compliance, the PMC and DFZ should apply the full range of remedies that are allowed by the respective contracts, up to and including removal of personnel or withholding payment for interim certificates until works are completed in compliance with contract requirements, including ESHS requirements.
- 9.1.5. It is important that ESHS managers and personnel have the authority to suspend works immediately if breaches of ESHS requirements are observed that could lead to injury, property damage, or serious environmental harm. In such a case, only the project manager and/or the ESHS manager would have the authority to allow work to resume, and only then if the issue(s) had been resolved.
- 9.1.6. In addition, all personnel must be aware that they may refuse to undertake a task if they are in fear of serious injury or death. In such a case, the supervisor and project manager must investigate and order appropriate action to reduce the risk or change the job.
- 9.1.7. In addition to actions taken to resolve and investigate incidents, contractors will also need to submit reports as specified in the next section.

10 ESHS REPORTING

10.1.1. ESHS performance will be reported as follows, and as shown in **Figure 10-1**:

EPC Contractors will submit monthly reports to the PMC and the PMC will summarize these reports and their own ESHS supervision activities in their own monthly reports to JSC Rogun. Infrastructure construction and demolition contractors will submit monthly reports to DFZ. JSC Rogun and DFZ will submit quarterly reports to PMG. PMG will submit semiannual (twice per year) reports to the World Bank and other Lenders.

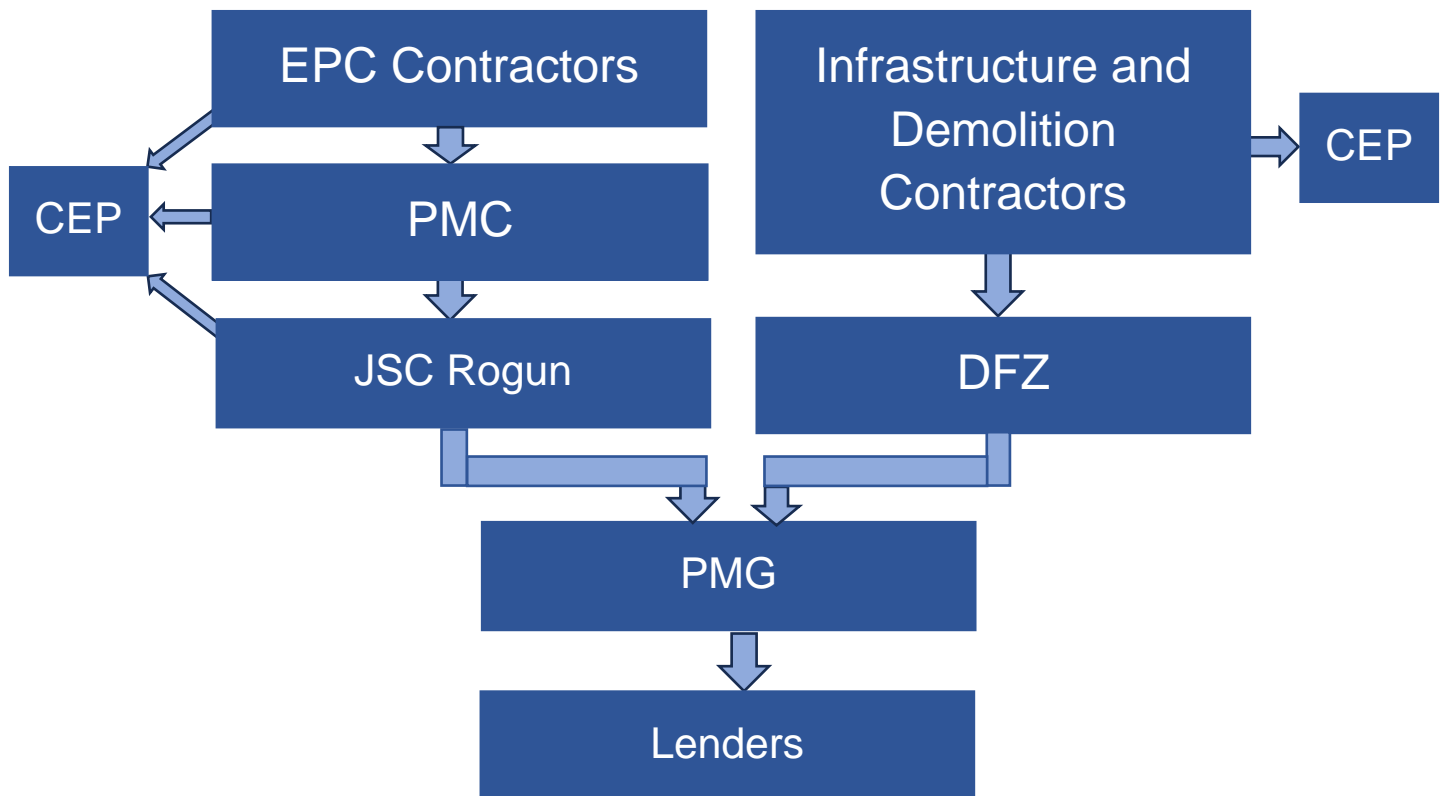


Figure 10-1 ESHS Performance Reporting

10.1.2. Reports by the PMC and by contractors will be as required in the respective contracts and in contractors' approved management plans. Contractors' monthly reports will be required to include at least the following details of environmental, social, and health and safety performance, some of which may be in addition to what may be required by the contracts:

- Status of violations and corrective actions reported as outstanding in the previous month's report
- Summary of activities undertaken and completed in the previous month, including ESHS-related training.
- Workforce: number of workers (including subcontract workers), number of local vs other Tajikistan vs foreign, number women and men, number of new hires, and number of terminations and reasons

- Summary of ESHS monitoring/supervision activities: person-days by ESHS specialists, number of inspections, areas visited, etc.)
- Results of ESHS supervision actions: issues identified, and actions taken (warnings or dismissals, stop work orders, requirements for safety equipment or new PPE, other actions)
- Description of environmental issues observed (spills, improper materials storage, improper waste management, etc.) and actions taken to bring into compliance.
- Description of consultations with local authorities and local community members, including who participated, reasons, and outcomes.
- Description of environmental issues observed (spills, improper materials storage, improper waste management, etc.) and actions taken to bring into compliance.
- Description of consultations with local authorities and local community members, including who participated, reasons, and outcomes.
- Summary of stakeholder grievances received during period and to date, number resolved during period and to date, and number outstanding. For grievances not resolved as of the end of the period, the report should provide a description of grievance, reason for lack of resolution, and actions to be taken in the coming period.
- Summary of worker grievances received during period and to date, number resolved during period and to date, and number outstanding. For grievances outstanding over 30 days, the report should provide a description of grievance, reason for lack of resolution, and actions to be taken in the coming period.
- Activities to be undertaken in the next month and any issues that are expected to be encountered.

10.1.3. Reports by the PMC to JSC Rogun, by JSC Rogun to PMG, and by DFZ to PMG will summarize the above for contractors they supervise, with some emphasis on workforces, occurrence and resolution of violations, and grievance management, and will describe their own supervision own activities. In addition, DFZ will report to PMG a summary of resettlement activities undertaken and completed in the previous month and to be undertaken in the next month.

10.1.4. Throughout construction, PMG will submit a quarterly report to the World Bank and other Lender(s) that summarizes ESHS performance on the Project, as specified in the ESCP.

10.1.5. In addition to scheduled reports, significant issues and events will be reported immediately (i.e., within 24 hours) by the contractors to the PMC to JSC Rogun, by JSC Rogun and DFZ to PMG, and by PMG to Lender(s). Such issues and events will include severe injuries or fatalities to workers, damage to private property or injuries to community members, significant spills or releases of hazardous substances to the environment, protests or incidents of unrest associated with the Project, and other incidents as defined in the ESCP.

10.1.6. Any such incident will be investigated to identify root causes and actions taken to prevent recurrence. Investigations and actions taken will be documented in root cause analyses, which will be submitted to the World Bank and other Lender(s) within two weeks unless additional time is granted for further investigation and action.

11 ESTIMATED COSTS

- 11.1.1. As previously noted, PMG will oversee the ESHS performance of JSC Rogun and DFZ; DFZ will supervise ESHS performance of its contractors; JSC Rogun will oversee the PMC's supervision; and the PMC will in turn supervise the EPC Contractors. All of this is intended ensure that all parties are fully implementing the required mitigation measures during the procurement, preconstruction, construction, and operation phases. These measures include training for workers, so they are familiar with their own personal responsibilities as well as their employers'.
- 11.1.2. The first level of monitoring during construction will be conducted by the contractors in routine management of ongoing activities. This will be supplemented by nearly continuous monitoring by the PMC and DFZ and periodic monitoring by JSC Rogun and PMG.
- 11.1.3. In addition, there will be independent third-party audits of various aspects of ESHS performance by all parties during construction, as follows:
- OHS performance: to be conducted at least twice a year for two years after the effective date and annually thereafter (a total of 11 from H2 2024 through 2029)²
 - Audit of environmental performance: to be conducted at least annually through 2029 and at contractor demobilization (a total of six audits from 2024 through 2029)
 - Audit of labor management practices: to be conducted biannually (every two years) through the end of construction in 2029 (a total of four audits from 2025 through 2029)
- 11.1.4. Overall, staffing for ESHS management and implementation by most organizations is considered to be significantly understaffed at present. This is not the case for the Lot 2 EPC Contractor, whose staffing is generally considered adequate or nearly adequate for current responsibilities.
- 11.1.5. Similarly, staffing by the Employer's Representative, Tractebel, would be considered adequate if a few more specialists were added, especially expatriates.
- 11.1.6. These two organizations' current (and in the case of Tractebel, augmented) staffing levels were therefore used to extrapolate required staffing for future supervision by the PMC and future implementation by contractors.

PMC: Tractebel currently has 10 HSE staff to supervise Lot 2 ESHS performance. These 10 managers and staff supervise the ESHS performance of the approximately 4,000 employees of the Lot 2 EPC Contractor and subcontractors. These 10 staff include an expat HSE manager, a local deputy, a local administrator, and seven local shift HSE specialists (three for 15-day shifts of daytime workers and one for each of the four day-night shifts). An additional HR specialist will be needed to supervise subcontractors' labor management (this is not currently required, and it is assumed that an HR manager already handles labor management of direct employees'), an additional expat administrative support person is also reported to be needed, and an expat environmental manager would also be advisable, as this is function is somewhat overlooked at

² An independent OHS expert, financed by the Technical Assistance grants, has been appointed to conduct semiannual audits beginning in H2 2023, and this will continue after the effective date.

present. In addition, an additional HSE specialist for each of the four day/night shifts would be advisable as well. This would come to a total of 17 managers and staff, including three expats, to supervise 4,000 workers. If this ratio of 17:4,000 is applied to an expected workforce of all EPC Contractors of 16,000, the PMC will require up to 68 ESHS staff. This would include six to eight expats, including ESHS manager, safety manager, environmental manager, and additional specialists.

EPC Contractors: There are currently 54 ESHS managers and specialists employed by WeBuild and its main subcontractor, including five expatriate employees. These are responsible for the activities of 4,000 workers. While adequate for WeBuild itself, the subcontractor has insufficient safety officers, and would need an additional 10 or more to reach a minimum ratio of one safety officer per 100 workers. However, this is balanced by the fact that WeBuild staffing includes 11 laboratory personnel, and it is doubtful the other EPC Contractors will need that level of staffing for laboratory work, so this estimate is considered high. Again, extrapolating the 54 ESHS personnel for a workforce of 4,000 to a workforce of 16,000 results in a total of up to 216 ESHS personnel required once all EPC Contractors are in place, including 20 expatriates.

- 11.1.7. ESHS staffing for construction and operation is presented in **Table 5-1**. Staffing and costs shown here are for ESHS management planning, implementation, and supervision of the construction program (including the biodiversity “Clerk of Works” required by the Biodiversity Management Plan). Required DFZ staffing for the resettlement program are provided in the RPF.

Table 11-1 ESHS Staffing for Construction and Operation

Nominal position	PMG	JSC Rogun (construction)	JSC Rogun (Operation)	DFZ	PMC	EPCs	DFZ Contractors
ESHS Manager	1	1	1	1	2	4	1
Safety/HSE specialist	1	2	1	0	47	168	1
Environmental specialist	1	2	1	0	6	16	0
Social specialist	1	1	1	0	1	4	0
Labor specialist	1	1	1	1	6	16	0
Administrator	1	1	1	1	6	8	0
ESHS advisor	0.5	0.5	0	0	0	0	0
OHS advisor	0.5	0	0	0	0	0	0
Total	7	8.5	6	3	68	216	2
Local/Tajik	6	8	6	3	56	196	2
Expatriate	1	0.5	0	0	12	20	0

- 11.1.8. Rough estimates of payroll and other costs for managers and staff were used to arrive at an annual cost for ESHS personnel (costs are assumed to be inclusive of salary, benefits, travel costs,

accommodations, etc.). In addition to approximate office overheads for the expense of purchasing computers, office equipment, supplies, instruments, vehicles etc. This was estimated at \$5,000 per employee. This is shown in **Table 11-2**.

Table 11-2 Estimated Annual Cost for ESHS Management and Staffing

Category of manager/staff	Number of managers and staff	Average payroll and other cost	Estimated office overheads	Annual payroll and other costs
Local/Tajik	277	\$62,500	\$1,385,000	\$17,312,500
Expatriate	33.5	\$250,000	\$170,000	\$8,375,000
Total	310.5		\$1,555,000	\$25,687,500

- 11.1.9. Assuming costs are incurred from 5.5 years from the second half of 2024 through 2029, the total cost for ESHS management and staffing through HPP construction would be \$141,281,250 .
- 11.1.10. Other costs of ESHS management and implementation are estimated in Table 11-4Table 11-3. In general, these would include costs for ESHS planning that is done by appointed consultants (as opposed to staff whose costs are accounted for above), the audits mentioned in paragraph 11.1.3 and for the relatively few capital items that would be required.

Table 11-3 Estimated Costs for ESHS Planning and Implementation

Cost element	Party incurring cost	Cost/Expense
Development and update of management programs/plans	JSC Rogun, DFZ, Contractors (development through appointed consultants)	\$1,500,000
Cleanup of Construction Camp 1, Left and Right Banks, and other areas in advance of inundation by 2027	JSC Rogun, Lots 1 and 3 Contractors, non-EPC Contractors	\$2,000,000
Wastewater treatment	JSC Rogun, Contractors	\$3,000,000
Waste treatment/ management	JSC Rogun, Contractors	\$2,000,000
Tunnel ventilation (other than Lot 1)	Contractors	\$1,000,000
Safety equipment, instruments, laboratory testing, etc.	JSC Rogun, Contractors	\$2,000,000
Third party audits (21)	PMG	\$2,100,000
Total		\$13,600,000

- 11.1.11. It is important to note that ESHS performance during construction should be considered an integral part of the works, not as a separate component of the construction process. This makes it

inappropriate to estimate the costs of mitigating impacts as if it could be separated from construction without mitigation.

- 11.1.12. The EPC Contractors who will be undertaking all works will be international firms with a demonstrated track record of ESHS performance, including integration of good international industry practice into normal construction practices.
- 11.1.13. In addition, although some measures may be considered “mitigation” and required by the ESMP, they are not considered separately since they are essential to the successful completion of the works. This would include such things as ventilation of the powerhouse or removing debris from the reservoir since both are essential to successful operation.
- 11.1.14. The PMC is expected to recognize the characteristics of these paragraphs and consider that a milestone eligible for payment is to be considered complete only if it is completed in compliance with all requirements of the respective contract, including ESHS requirements. Thus, the PMC is expected to recommend payment of interim payment certificates only if the milestone is complete in compliance with ESHS requirements of the contract, which would include the approved management plans. The same would be true for DFZ contracts.
- 11.1.15. The costs of the resettlement and livelihood restoration program are estimated in detail in the RPF and summarized in Table 11-4

Table 11-4 Estimated Costs of Resettlement Program

Cost element	Cost/Expense
RAP2/LRP2 2018-2025 (1605 households)	\$83,900,000
Future RAPs/LRPs	\$296,400,000
Total	\$380,300,000

- 11.1.16. The total cost of ESHS management staffing, other ESHS program costs, and the resettlement program costs are shown in **Table 11-5**. As can be seen, over 70 percent of costs are estimated to be for resettlement of households, and most of the remainder for employment and managers and staff to implement the ESHS programs of PMG, JSC Rogun, DFZ, and contractors.

Table 11-5 Total Estimated Cost of ESHS and Resettlement Programs

Cost element	Cost/Expense
Management and Staffing	\$141,281, 250
Other ESHS Costs	\$13,600,000
Resettlement Program Costs	\$380,300,000
Total	\$535,181,250



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