

**DAM REHABILITATION AND IMPROVEMENT PROJECT (DRIP)**  
**Phase II**  
(Funded by World Bank)

**MYNTDU LESHKA CONCRETE DAM STAGE - I**  
**(PIC: ML22HH0006)**

**ENVIRONMENT AND SOCIAL DUE DILIGENCE REPORT**



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## ABBREVIATIONS AND ACRONYMS

AIDS	:	Acquired Immunodeficiency Syndrome
CA	:	Conservation Area
CEA	:	Centre Electricity Authority
COVID	:	Coronavirus Disease
CPMU	:	Central Project Management Unit
CWC	:	Central Water Commission
DBA	:	Dam Break Analysis
DPR	:	Detailed Project Report
DRIP	:	Dam Rehabilitation and Improvement Project
DSRP	:	Dam Safety Review Panel
E&S	:	Environment & Social
EAP	:	Emergency Action Plan
ESDD	:	Environmental and Social Due Diligence
ESF	:	Environmental and Social Framework
ESIA	:	Environmental and Social Impact Assessment
ESMF	:	Environment and Social Management Framework
ESMP	:	Environment and Social Management Plan
ESS	:	Environmental and Social Standard
GBV	:	Gender Based Violence
GDP	:	Gross Domestic Product
GIS	:	Geographic Information System
GRM	:	Grievance Redressal Mechanism
HEP	:	Hydroelectric Project
HIV	:	Human Immunodeficiency Virus
IA	:	Implementation Agency
IPF	:	Investment Project Financing
LMP	:	Labour Management Procedure
MCB	:	Miniature Circuit Breaker
MCM	:	Million Cubic Meters
MDDL	:	Minimum Draw Down Level
MEPGCL	:	Meghalaya Power Generation Corporation Ltd.
MIS	:	Management Information System
MWL	:	Maximum Water Level
NRSC	:	National Remote Sensing Centre
OHS	:	Occupational Health & Safety
PA	:	Protected Area
PAP	:	Project Affected Person
PDO	:	Project Development Objective
PE	:	Physical Environment
PPE	:	Personal Protective Equipment
PST	:	Project Screening Template
PWD	:	Public Works Department
RCC	:	Reinforced Cement Concrete
RET	:	Rare Endangered and Threatened
RFB	:	Request for Bids

RTI	:	Right to Information
SC	:	Scheduled Castes
SCADA	:	Supervisory Control and Data Acquisition
SEA	:	Sexual Exploitation and Abuse
SEAH	:	Sexual Exploitation Abuse and Harassment
SF	:	Screening Format
SH	:	Sexual Harassment
SPMU	:	State Project Management Unit
ST	:	Scheduled Tribes
WB	:	World Bank
WQ	:	Water Quality

# EXECUTIVE SUMMARY

Myntdu Leshka is a Run-of-River hydropower project (3 x 42 MW) built across the River Myntdu, flowing through East and West Jaintia Hills District of Meghalaya. The dam is constructed just downstream of the confluence (Leshka) of the three rivers viz. Myntdu, Lamu and Amshariang, to utilize the discharges from these three rivers with a total catchment area of about 350 sq km. It is a 63 m high concrete dam with live storage of 7 MCM; water is diverted through a 3304 m long Horse-shoe shape tunnel with 3.43 m finished dia to the Lynriang river. Project is owned and operated by MePGCL, which has proposed to undertake rehabilitation measures (structural, non-structural, instrumentation and basic facility enhancement) under the proposed Dam Rehabilitation and Improvement Project (DRIP II) with a view to increase the safety and to strengthen dam safety management.

The Environment and Social Due Diligence has been conducted for decision-making on the sub-project with a view to identify, evaluate and manage the environment and social risks and impacts in a manner consistent with the World Bank ESF. ESDD has been carried out by studying the sub-project information and proposed interventions, assessing the magnitude of E&S risk and impacts with respect to key baseline data in immediate vicinity area. Limited stakeholder consultations with communities living downstream/vicinity of the dam, has been carried out keeping in view COVID19 restrictions.

Activity wise environment and social screening has been carried out to identify risks and impacts to classify the sub-project based on risk level (low, moderate or substantial and high) and recommend commensurate plans/measures to meet identified risks and impacts.

As per the ESDD exercise, risk/impacts that have been identified relate to Water Quality, Physical Environment, labour and SEAH/GBV. These risks are low to moderate and localised, short term and temporary in nature which can be managed with standard ESMP and guidelines. Environment risks of air, water, noise, land use, soil and resource use for most of the activities as well as social risks of labour to labour/community are Moderate. Environment risks of pollution downstream and upstream are categorised as Moderate for works interfacing with water body. Similarly, environment and social risk of labour camp and disposal of debris has been identified as moderate. Risk of all other activities has been identified as Low. These risks are low to moderate and localised, short term and temporary in nature which can be managed with standard ESMP and guidelines. OHS is a substantial risk activity and is being treated separately through OHS plan in accordance with WB ESHS guidelines.

Since risks and impacts are low to moderate category, a standard ESMP customised to sub-project will be prepared in accordance with the ESMF. The customised ESMP will address the following:

- Gender Based Violence or SEA/SH related actions (ESS1)
- Labour Management Procedure (ESS2)
- Resource Efficiency and Pollution Prevention (ESS3)
- Community Health and Safety (ESS4)
- Tribal Development Plan (ESS7)

- Stakeholders Engagement Plan (ESS10)

Overall, the proposed activities within this dam sub-project have low to moderate risks resulting in the overall sub-project to be categorized as Moderate risk category. These risks and impacts can be effectively mitigated with effective implementation of mitigation plans by SPMU/IA, Contractors and monitoring by EMC, SPMU and CWC.

**1.1 PROJECT OVERVIEW**

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The proposed Dam Rehabilitation and Improvement Project (DRIP II) would complement the suite of ongoing and pipeline operations supporting India's dam safety program. The project development objective (PDO) is to increase the safety of selected dams in participating States and to strengthen dam safety management in India. Project Components include:

Component 1: Rehabilitation and Improvement of Dams and Associated Appurtenances (US\$ 577.14 million);

Component 2: Dam Safety Institutional Strengthening (US\$ 45.74 million);

Component 3: Incidental Revenue Generation for sustainable operation and maintenance of dams (US\$ 26.84 million);

Component 4: Project Management (US\$ 68.13 million).

Component 5: Contingency Emergency Response Component (US\$ 0 million).

The project is likely to be implemented for 300 dams in 18 states across the country. The primary beneficiaries of the project are the communities that live in dam breach flood inundation areas and the communities that depend on water, irrigation and electricity services provided by the dams that could be compromised by poor dam performance or failure. In addition to saving lives, improved dam safety will avoid potential flood damage to houses, farm areas, infrastructure (roads, bridges, other public and private infrastructure) and industrial and commercial facilities. Improved dam safety will also reduce the likelihood of service interruptions due to dam failure as well as potentially improving dam service provision, overall efficiency and storage capacity, including during drought periods.

**1.2 SUB-PROJECT DESCRIPTION – MYNTDU LESHKA**

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Myntdu Leshka H. E. Project Stage I (3 x 42 MW) is a Run-of-River Scheme built across the River Myntdu, flowing through East and West Jaintia Hills District of Meghalaya. The dam site is approachable through a project road (10 km long) from the main PWD District Road. The dam is constructed just downstream of the confluence (Leshka) of the three rivers viz. Myntdu, Lamu and Amshariang, to utilize the discharges from these three rivers from a total catchment area of about 350 sq km. The project has a gross head of 334 m and net head of 316.16 m available between Leshka Dam Site and Power House Site, located on right bank of Lynriang river. The project was initially planned in 1999 (DPR) to generate 84 MW (2 \* 42 MW) however, it was reviewed during the detailed engineering design stage by CWC and CEA, in year 2006-07. As a result, after conducting detailed studies, an additional unit of 42 MW was added in January 2009 to enhance its generating capacity to 126 MW (3 \* 42 MW) with an annual design energy of 486 MU. Environment clearance on the third added unit was obtained vide Ir.No.J-12011/35/2008-IA-I dated: 12.08.2008.

The Myntdu Leshka HEP is constructed with a 63 m high concrete dam to impound the water in the reservoir with live storage of 7 MCM to divert the water through the water conductor system consisting of 3304 m long Horse –shoe shape tunnel with 3.43 m finished dia to the Lynriang river. Salient features of the project area are reported below:

<b>Project</b>	Myntdu Leshka H. E. Project Stage I
River	Confluence (Leshka) of the three rivers viz. Myntdu, Lamu and Amshariang
Lat/Long	25 <sup>0</sup> 15' 46.46" N/92 <sup>0</sup> 15' 5.45" E
Hydro Power Generation	3 *42 MW = 126 MW
Catchment Area	350 sq km
<b>Main Dam</b>	
Type	Concrete Gravity Dam
Length	319.60 m
Top elevation	620 m
Elevation of top of upstream solid parapet wall	621.5 m
Height of dam above deepest foundation level	63 m
Lowest river bed level	561 m
Deepest foundation level	557 m
<b>Spillway</b>	
Type of spillway gates	Ogee
Length	28.3 m
Location of spillway	Concrete Dam body, Central spillway
Crest level	587.5 m
Number of bays	7
Discharge capacity at MWL	10440 cumec
Size of spillway gate	8 m wide & 12 m high, radial
Type of energy dissipation arrangement	Flip Bucket
<b>Reservoir</b>	
Maximum water level	618 m
Full Reservoir Level	618 m
MDDL	606.15 m
Live storage	7 MCM
Gross storage	14 MCM
Reservoir spread area (max)	71.13 ha
Year of start of construction	11.03.2004
Date of completion	01.04.2013

### 1.3 PROPOSED INTERVENTIONS/ACTIVITIES AND INTENDED OUTCOMES

Dam Safety Review Panel (DSRP) constituted by CWC, Government of India has inspected and made a review of Myntdu Leshka dam on 31/10/2019 and recommended measures to improve the safety and performance of dam and associated appurtenances in a sustainable manner, and also to strengthen the dam safety institutional set-up.

The objectives of the project are to be achieved through investments for physical and technological improvement activities, managerial upgrading of dam operations, management and maintenance, with accompanying institutional reforms. The project will improve the safety and operational performance of dam and mitigate risks to ensure safety of downstream population and property. The following rehabilitation proposals as described in the PST have been formulated based on DSRP recommendations and these proposals form the basis for preparation of present ESDD report.



## **1. Structural Rehabilitation Works (Civil Works)**

### **Reservoir**

- Construction of Step Concrete Wall near Intake at Left Bank collapsed on the 20<sup>th</sup> July 2019 near Intake.
- Construction of Step Stone Masonry Wall Above Staff Quarter near View Point and D.G. Set at Right Bank.
- Construction of Step Protection Wall below D.G. Set at Right Bank.
- Re-Construction of Grill Railing at Top of Retaining Wall constructed at the area of Masonry wall collapsed on 20<sup>th</sup> July 2019 near Intake.
- Construction of Protection/Step Stone Masonry Wall in the Reservoir rim at Right Bank.

### **Dam and Dam Block/Reach (Concrete) - Upstream Face**

- Grouting in the Upstream face of the Dam Body and Second Stage concreting at Stop-Log groves.
- Repairing of 2nd Stage Concrete in Block-Outs of Chute Spillway including Face Concreting over the existing eroded surface at Crest Level of Chute Spillway

### **Crest of Dam (Dam Top)**

- Topping with fresh Concrete Mix with Epoxy compound at Dam Top.
- Providing Protection Railing at Block No. 18 & 19.
- Renovation of Dam Control room and Stairways including painting.
- Extension the height of Cable Trench from D.G. Set to Dam Control Room upto Power Intake.
- Watch Towers 2 Nos.
- Providing Digital Sign Boards at Concrete Dam.

### **Downstream Face**

- Grouting in the downstream Second Stage Concreting of the Gate groove guides inc. Crack inside.
- Repairing of cable tray from Dam Control Room to all power pack house.

### **Gallery/Shaft and Drainage (Concrete): Inspection Gallery**

- Remaining of Uplift Pressure Pipe and Porous Pipe.
- Repairing of Gallery drain inc. Hand Railing and making V-Notch inside the Gallery.
- Providing Lifting arrangement for Sump Well Pump and Protection Railing.
- Supplying and installation of 30 HP Submersible Pump (Standby) with permanent pedestal inc. Piping System.
- Cleaning of silt and sludge of Foundation Gallery and Sump-well including procurement of 30 HP sludge pump.
- Curtain Grouting.

## **Electrical**

- Repairing HPSV/MH fitting junction boxes and associated auxiliaries to replace the damaged top lantern poles and fixture.
- Repairing of Internal Electrification with water proof wire, socket, switch, MCB, etc. inside gallery.
- Repairing of illumination system in the walkway Down Stream of the Dam.

## **2. Structural Measures for Ensuring Hydrological Safety**

### **Spillway and Energy Dissipation Structures:**

#### **Spillway Gates (Radial Gates)**

- Painting of all Radial gates inc. trunion, girder etc. with suitable rust preventive Epoxy Paint as Recommended by CWC.
- Procurement, fixing and testing of Rubber Seals for all Gates.
- Painting of Stop-log gate.
- Changing of Trunion hubs including renovation of Trunion Assembly for all Radial Gates, Horizontal Plate Girder, fixed Seals of the Gates, Anchored etc.
- Providing Safety Railing and drilling of drain holes at horizontal girders inc. Welding Works in the bottom most of Radial Gate's Arm.
- Providing Permanent Hoisting Arrangement for Motorize Operating for Chute Spillway Gate with Permanent Roofing, Safe Platform and Stairway.

### **Hoists and Operating Mechanisms**

- Supplying of New Remote control panel at Control room for Radial Gates.
- Renovation and Testing of Local Control panel for Radial Gates at Power Pack and Testing of Motor and all other Components of Power Pack.
- Changing of Hydraulic Piping System for Gate No. 3, 4, 5, 6, & 7 including Painting (with SS Pipe).
- Overhauling/Greasing of Rope of Gantry Crane including Painting.

### **Spillway Bridge, Hoist Bridge, Trunion Level Bridge Catwalks**

- Providing Protection Pipe Railing at Piers.
- Repairing and Providing additional support of Spillway Bridge.
- Providing approach Stairway/Walkway to reach Bucket Lip.

### **Approach Bridge, operation Platform and cabin (for intake/outlets):**

- Providing Permanent Roofing with Safe Platform and Stairway at Power Intake and Construction of additional supporting pillar of steel deck bridge at Power Intake including Repainting of Steel deck Bridge of Intake Structure.
- Construction of Permanent hatch cover of power Intake including bracing support and Painting of Intake gate including Hatch cover and Lifting beam at Power Intake.

### **Intake/Outlet Gates and Water Conveyance Structures.**

- Motorize operating arrangement 10 HP Motor for Emergency Gate.
- Providing Side/Guide Plate in the Intake's Emergency Gate and Procurement of brake shoe of intake gate.
- Under Water cleaning the trash rack bell mouth including painting.

### **Chute Spillway**

- Providing Drain Hole in the Chute Spillway Gate.
- Providing High Strength Concrete M90 in the Chute Spillway and Grouting on the Main Spillway and Chute Spillway.
- Making Platform and steps required to facilitate the people to reach the Spillway crest level.

### **Energy Dissipation Structures**

- Dewatering in the RCC Bucket Lip and Tail Pond.
- Construction of coffer bunds including making safe access approach road.
- Design check of Radial Gates, Intake Gates and Emergency Gate, hoisting equipment including Platform etc. with respect to the new Seismic Design Parameters studies.

## **3. Non-Structural Measures**

- Flood forecasting equipment & all weathered station.
- Topographical Survey for the downstream River Section for Conducting DBA including the dam layouts.
- Dam Break Analysis and structural integrity health studies of these existing dams.
- Flood Routing and Spillway model studies.
- Reservoir operation Manual/Guidelines.
- Emergency Action Plan.

## **4. Basic Facilities Improvement**

### **Basic Dam Facilities**

- Construction of RCC Building for Site and Security Personnel at Dam Site.
- Construction of Security Shed at Left Bank at Dam Site.
- Extension of D.G. Set Control Room.
- Construction of Roof Covering for 250KVA D.G. Set with Protection Railing.
- Painting of Roof Covering of D.G. Set 320 KVA and Protection Railing.
- Construction of Drinking Water Source at Dam Site.
- Construction of Drinking Water Storage Tank and Pipe Line from storage Tank to Dam Control Room.
- Extension the height of Cable trench from D.G. Set to Dam Control Room up to Power intake.
- Dismantling of Existing Stone Masonry Guard Wall and Providing new Pipe Railing at Right Bank of Dam.
- Repairing of Existing Side Drain and Masonry wall at Right Bank of Dam.
- Painting of Water Level Pillar at both Left and Right Bank Pillar.
- Providing Pipe Line water for water supply from source to Staff quarter and Control Room.
- Supplying of Office Equipment's (LED, Computer, Printer, Plotter Machine, Xerox Machine, Digital Board Furniture, Office Furniture etc.).
- Providing and fixing Sign Board/Name Plates showing the salient features of project.
- Providing RCC Pedestal for 320 KVA D.G. Set.
- Turfing on both side of the Downstream.

- Renovation of the site offices and inspection bungalow

#### **Access Road**

- Metalling including Black Topping of a Road along the Pdengshakap to Damsite CH.0.00 – 11.00 KM.
- Metalling including Black Topping at Inspection Bungalow CH.0.00 – 150.00 M.
- Construction of Stepped breast wall to prevent erosion at CH.9.45-9.95KM of road from Pdengshakap to Damsite.
- Construction of Catch water drain at CH.9.50-9.90KM of road from Pdengshakap to Damsite.
- Construction of Stepped retaining wall to prevent soil erosion CH.10.40-10.70KM of road from Pdengshakap to Damsite.

#### **5. Instrumentation, SCADA, Surveillance system, etc.**

- Surveillance equipments including Dam Instruments.
- High Mass Lightning on both sides of the Abutments.

#### **6. Tourism/Fisheries/Hydropower Development**

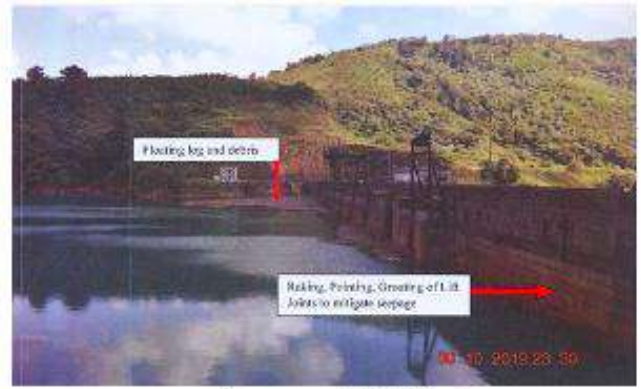
- Studies for development of Small Hydro Power Project downstream of Dam.
- Supply of Motor Boat for Dam for inspection purpose.
- Supply, installation and Erection of 1 MW Floating Solar Panel.

The above Tourism Development/ Fisheries Development/ Secondary power hydel / Solar Power have not been considered as part of present ESDD as feasibility studies including various options and their possible impacts on environment and social are yet to be carried out. ESDD on these sub-components will be conducted separately once the planning/design and feasibility studies are completed.

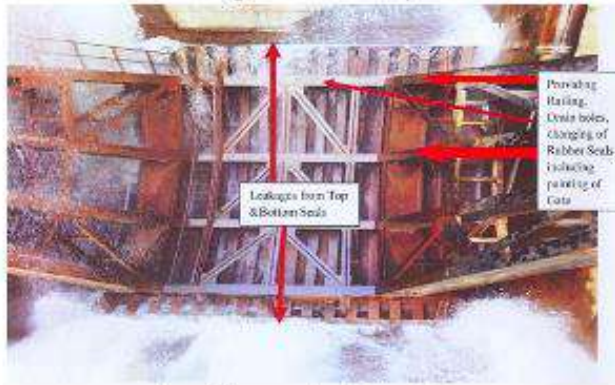
**Figures 1.1** provide photographs of key infrastructure proposed for rehabilitation works; **Figure 1.2** provide current status of approach road with width of its ROW and **Figure 1.3** provide locations of major interventions.



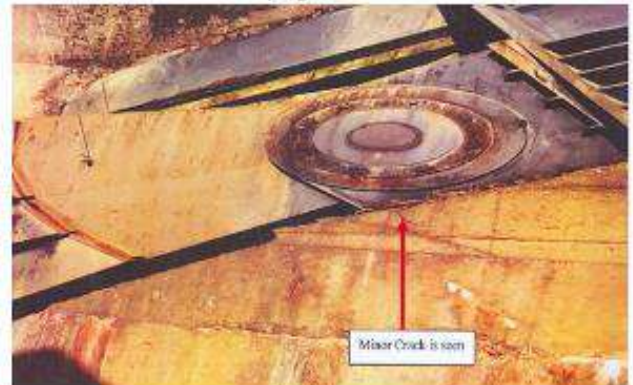
**Damaged of Dam Top**



**Seepage at Lift Joints**



**Damaged Rubber seals of Radial Gates**

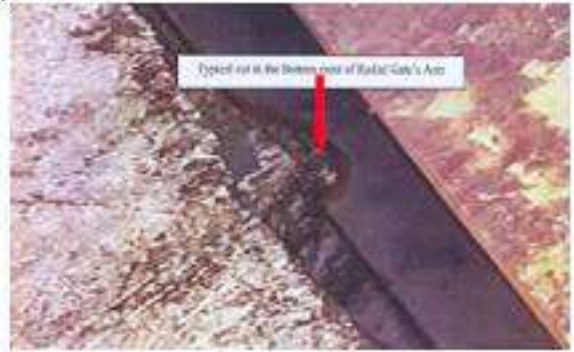


**Minor Crack of Trunion of Gate No.3**

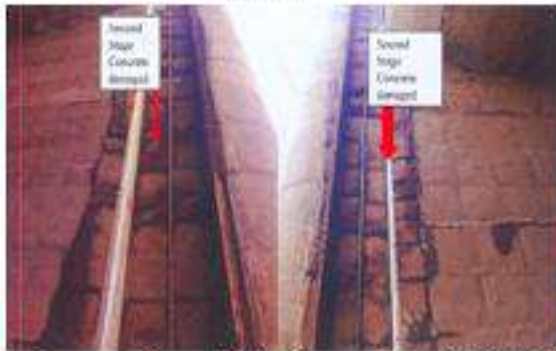




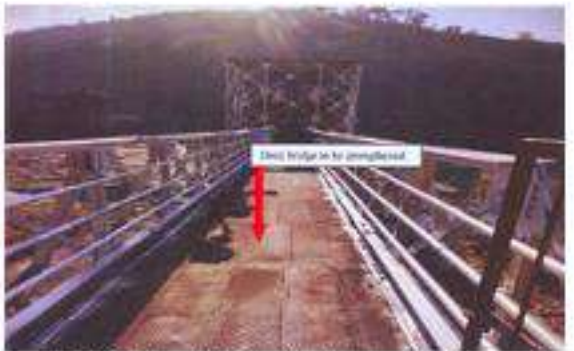
Radial Gate Guide Plate & Second Stage Concrete Eroded



Typical cut in the bottom most of Radial Gate's Arm



Damaged Second Stage Concreting on STOP LOG Grooves Guide Plate



Deck Bridge of the intake to be strengthened



Leakages in the Hydraulic Piping system



Leakages in the Hydraulic oil from Power Pack



Damaged Hydraulic Piping system and Cable Tray



Damaged Power Pack System





Damaged Motor of Radial Gate No.5



Leaching inside the dam Gallery, Foundation pipe choked



Porous pipe choked



Damaged Control Room Terrace



Landslide at upstream Right Bank



Landslide at Left Bank and Security Shed Collapsed



Damaged Approached road to dam



Figure 1.1: Selected Photographs of Improvement/Intervention area









Figure 1.2: Current Status of Approach Road with Width of its ROW





Figure 1.3: Project Area showing major intervention locations

## 1.4 IMPLEMENTATION ARRANGEMENT AND SCHEDULE

As can be seen from the list of activities proposed under dam rehabilitation project; these activities can be divided into civil works main package, other package and instrumentation. Civil work will be carried out by contractor(s) as these are labour intensive activities and would be completed over a period of 3 years. SPMU/IA will hire contractor(s) based on national open competitive procurement using a Request for Bids (RFB) as specified in the World Bank's -Procurement Regulations for IPF Borrowers, July 2016, (Revised August 2018 Procurement Regulations), and is open to all Bidders as defined in the Procurement Regulations. Following is the overall implementation and procurement schedule:

a) Overall Phasing of Project Implementation:

Proposed Starting of implementation (MM/DD/YYYY) : 01/04/2020

Proposed Ending of implementation (MM/DD/YYYY) : 31/03/2023

Implementation Duration (months) (MM) : 36 Months

b) Timeline phasing of implementation:

Sl. No.	Description	From (month/year)	To (month/year)	Status of Procurement Process
1	Civil Works – main package	01/04/20	31/03/23	Under estimate stage
2	Other Packages	01/04/20	31/03/23	Under estimate stage
3	Procurement – instrumentation, goods, inspection vehicles	01/04/20		

## 1.5 PURPOSE OF ESDD

The overall project (DRIP II) was categorized as High Risk as per the internal Environment and Social Risk Classification of the Bank. The Environment and Social Due Diligence has been conducted to use it as a tool for decision-making on the sub-project with the following specific objectives:

- i. To identify, evaluate and manage the environment and social risks and impacts of the sub-project in a manner consistent with the ESSs;
- ii. To adopt a mitigation hierarchy approach to the project's E&S risks i.e. a) anticipate and avoid risks and impacts; b) minimize or reduce risks and impacts to acceptable levels, if not avoidable; c) once risks and impacts have been minimized or reduced, mitigate; and (d) where significant residual impacts remain, compensate for or offset them, where technically and financially feasible;
- iii. To help identify differentiated impacts on the disadvantaged or vulnerable, if any, and to identify differentiated measures to mitigate such impacts, wherever applicable;

- iv. To assess the relevance and applicability of environmental and social institutions, systems, laws, regulations and procedures in the assessment, development and implementation of projects, whenever appropriate; identify gaps, if any exist, and
- v. To assess borrower's existing capacity, gaps therein, and identify areas for enhanced capacity towards management of E&S risks.
- vi. Based on the categorization of Environment and Social risks and impacts of the Dam sub-project, to determine whether ESIA is to be carried out using independent third-party agency or a generic ESMP customized to mitigate E&S risks and impacts will suffice.

## **1.6 APPROACH AND METHODOLOGY OF ESDD**

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The following approach has been adopted for ESDD:

- i. Study sub-project information, proposed interventions, their magnitude and locations and carry out assessment of each proposed intervention to identify the magnitude of E&S risk and impacts;
- ii. Review relevance and applicability of national and state legal requirements and Bank's ESF policy, standards and directives and preliminary assessment of applicability of legal requirement and ESS framework (2-8)
- iii. Conduct site visit to understand baseline environment and social settings, proposed activities under the sub-project, their location and sensitivity, if any.
- iv. present key baseline data essential for impact assessment in immediate vicinity area of proposed interventions from secondary sources, such as land-use, protected areas in vicinity, ascertain presence of indigenous (schedule tribe)/vulnerable people, etc.
- v. Undertake institutional assessment to identify existing capacities & relevant gaps to manage E&S risks and impacts
- vi. Conduct preliminary stakeholder consultations to help identify potential stakeholders; to provide information on the proposed interventions; to identify issues and concerns; and ascertain appropriate mechanisms for continued engagement
- vii. Carry out activity wise environment and social screening and identify risks and impacts. Classify the sub-project based on risk level (low, moderate or substantial and high) and recommend commensurate plans/measures to meet identified risks and impacts.

Stakeholder consultations with communities living downstream/vicinity of the dam, have been carried out in a limited way under the current circumstances due to COVID and these shall held as soon as situation is conducive for holding such consultations.

## **2.1 POLICY AND LEGAL FRAMEWORK**

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India has well defined environmental and social regulatory framework. The regulation applicability depends on nature of work and location of work. Broadly legislation can be divided into four categories viz environmental, forests, wildlife conservation and social. The applicability analysis of regulations pertaining to all the above four categories was carried out. The applicability of World Bank ESF comprising, 10 ESSs (ESS1 to ESS10) to the proposed rehabilitation proposals and Standard specific requirements were analysed. Further, a comparison of national environmental and social regulations versus World Bank's ESS has been carried out along with the gap analysis. Applicability of Indian regulations, World Bank's ESS along with comparison and gap analysis is discussed in ESMF.

Central Water Commission, Ministry of Jal Shakti, Government of India has prepared "Operational Procedures for Assessing and Managing Environmental Impacts in Existing Dam Projects" and is under publication as a guiding document for the dam owners to systematically address in advance the environmental safeguard requirements and have discussed in detail all applicable legal requirement. Reference has been drawn from this document as well, while carrying out applicability analysis.

Indian environmental regulations requiring environment clearance is for new dam projects specifically for the purpose of hydropower generation and/or irrigation projects and vary with generation capacity for hydropower projects and culturable command area served by irrigation projects. Forest related clearances become applicable, if new or any modification in any existing project requires diversion of forest land for non-forestry purposes. Wildlife Clearance process gets triggered if the project is in proximity to protected area or activities are proposed within protected areas (CA).

Therefore, for the proposed dam rehabilitation activities at Myntdu Leshka Dam, which are limited to dam area and do not require any additional private or forest land and do not fall within any protected area; regulatory clearances will not be applicable as per Indian regulation.

## **2.2 DESCRIPTION OF INSTITUTIONAL FRAMEWORK**

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The sub-project will be implemented by Meghalaya Power Generation Corporation Limited (MePGCL), Meghalaya. The mandate of MePGCL is:

- Medium and Major Hydro Power Projects
- Management of floods, including construction of major dams and drainages
- Management and Preservation of Water Resource
- Investigation of Hydro Power Projects

For implementation of the sub-project, SPMU has been set up in which the Director (Generation), MePGCL is the Nodal Officer. Team comprise of Dam Manager, SE (C), HSM, MePGCL, assisted by 3 (three) Executive Engineers and 8 (eight) Assistant Executive Engineers; besides other Field Engineers in the rank of AE's/JE's who reports directly to their respective Executive Engineers. All EE's reports to Dam Manager.

The Environment Division is headed by the Executive Engineer (C) under SE, Design circle, MePGCL, and is responsible for day to day activities related to the environmental aspect. The overall in-charge is the Director (Generation), MePGCL. In addition, A High Level Technical Committee consisting of personnel from Technical, Finance and safeguard sections to handle Legal, Environment and Social Aspects will also be constituted directly under the supervision of the Director (Generation) with Chief Engineer as its Member Secretary.

In addition, need based appointment of Environment and Social Experts to enable preparation of Environment Management Plans as well as for support in implementation of mitigation measures will also be taken up by the office of the Director (Generation), MePGCL. MePGCL will hire experts from outside department or seek deputation of staff with relevant experience to facilitate issues related to the environment and social aspect during implementation of the sub-project, under DRIP II.

SPMU will designate Nodal Officer(s) (full time in-house engineering staff with E&S expertise) to coordinate and supervise E&S activities. They shall be at the level of Executive Engineer/ Deputy Directors and shall provide commensurate time to comply with E&S related activities. Brief TORs for these Nodal E&S officers is included in ESMF. The SPMU, in case in-house expertise not available, will hire the qualified staffs on need basis to support management of E&S risks including Environmental and Social Experts for ensuring compliance with the Bank's ESF and ESS's and ensuring that these activities shall be implemented as per the procedures.

Presently, no formal system has been established for dealing with external complaint or a formal GRM. There is no internal complaint committee as per Sexual Harassment Act either at dam level, which will be implemented before start of work. A Grievance Redress Mechanism (GRM) will be established and operated by the contracted agencies to address Project workers workplace concerns before start of the work. SPMU will have oversight responsibility on the functioning of the GRM.

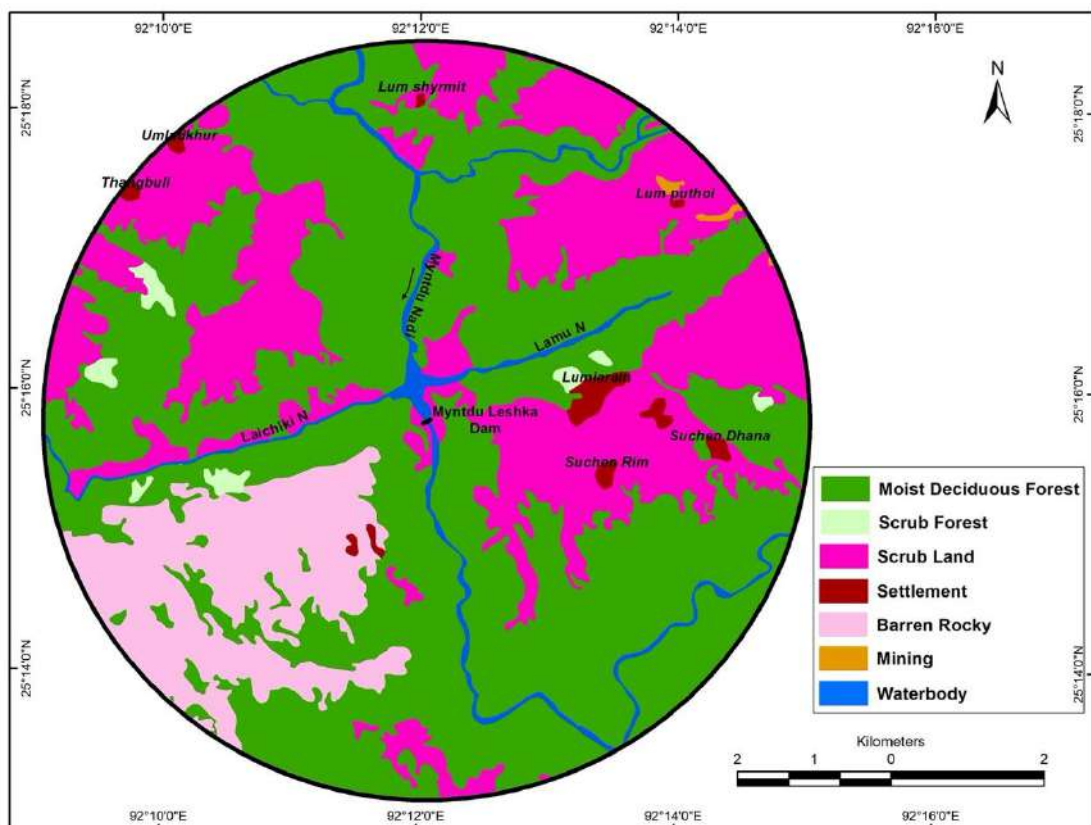


Assessment of physical, ecological and socio-economic conditions at dam site and immediate surrounding has been carried out based on secondary information and site observations; as discussed below.

## 3.1 PHYSICAL ENVIRONMENT

### Land Use/Land Cover

The project surrounding area land use and environmental sensitivity was analysed using GIS techniques. Land use/ land cover map within 5 km radius of dam is presented at **Figure 3.1**. As can be seen from the map, present land use around dam is predominantly moist deciduous forest, scrub land, waterbody (reservoir) and barren rocky. However, as discussed under Chapter 1 about project description, the project activities will be confined to dam body only and no structural interventions are proposed beyond existing dam boundaries. Seven villages are falling in 5 km radius on downstream of dam namely - Lumiarain, Lum Puthoi, Lum Shyrmith, Umladkhur, Thangbuli, Suchen Rim and Suchen Dhana.



*[(Source: Digital data on land use/land cover maps using bhuvan prepared by National Remote Sensing Centre (NRSC) with North East Space Application Centre, Meghalaya along with further refinement using Google Earth]*

**Figure 3.1: Land Use and Land Cover Map of 5 km radius around Dam site**

### **Natural Hazards**

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Potential of natural hazards such as earthquake and flooding have been assessed.

Project falls in most active earthquake zone V, and dam design has taken care of this aspect as well. Detailed engineering design checks are carried out on the basis of revised earthquake design parameters and taken into consideration various loading conditions as per relevant IS codes. *Zones, viz. Zone II, III, IV and V. Zone II is the least active and Zone V is the most active.*

Original Design Flood of the project at MWL is 10440 cumec while the revised design flood as per latest review on 19.12.2019 by CWC has been worked as 10559 cumec which almost same. Maximum observed flood peak so far has been observed a 5832 cumec on 01.05.2019.

### **3.2 PROTECTED AREA**

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No protected area or conservation/community reserve has been observed up to 20 km from Myntdu Leshka dam site location. Nearest protected area is Narpuh Wildlife Sanctuary and nearest boundary is about 22 km from Myntdu Leshka dam site location.

### **3.3 SOCIAL ENVIRONMENT**

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The Myntdu Leshka Dam is located across the river Myntdu, flowing through East & West Jaintia Hills district in the state of Meghalaya. The proximity villages' areas i.e. villages which fall within 5 km distance from the dam, these are Lumiarain, Lum Puthoi, Lum Shyrmit, Umladkhur, Thangbuli, Suchen Rim and Suchen Dhana. The project area falls within the Schedule VI<sup>1</sup> areas of Meghalaya. The East West Jaintia Hills district has only one (01) town namely Jowai and five (05) Community & Rural Development Blocks namely Thadlaskein, Amlarem, Laskein, Khliehriat and Saipung C. & R.D. Blocks. The number of villages in the district is 537 out of which 498 are inhabited and the remaining 39 are uninhabited.

Natural economic resources namely forestry, minerals and mining, agriculture, fishery etc. play a vital role in the development of economic infrastructure of the district. Forests play a vital role in the economy of the district and provide large quantities of timber for construction of building, making of furniture as well as fuel and fodder besides ensuring conservation of water and soil etc. Most of the economic mineral resources of the district are associated with tertiary formations of Eocene age. The minerals associated with the formations are Limestone, Coal, Phosphorite, Lithomargic clay, etc.

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<sup>1</sup> Schedule VI of Article 244 (2) & Article 275 (1) of the Constitution of India makes separate arrangements for the tribal areas of **Assam, Meghalaya, Mizoram, and Tripura**. As per the recommendation in the Constitution, a provision has been made for creation of District Councils and Regional Councils to provide due representative structures at the local level to the tribal population.



The district economy is basically agrarian as it is rural based with agriculture contributing significantly towards state GDP. Agriculture thus plays a great role in the overall economic development of the district and the state. The generation of income and employment also depends upon the agricultural activities. In the district, the available fishing resources are either in natural pond or river. Fisheries are yet to be developed in a scientific manner. The traditional and old method of fish culture has been practised by the fish farmers in the district.

The brief demographic characteristic of the district is given in the table below:

<b>No. of Households</b>	<b>66,028</b>	<b>Household Size</b>	<b>06</b>
<b>Total Population</b>	<b>395,124</b>	<b>Population (0-6 age)</b>	<b>90,911</b>
Male	196,285	Boys (0-6 age)	46,011
Female	198,839	Girls (0-6 age)	44,900
Sex Ratio	1,013	Sex Ratio (0-6)	976
<b>Population (SC)</b>	<b>1, 317 (0.33%)</b>	<b>Population (ST)</b>	<b>376,099 (95.19%)</b>
Male	784	Male	185,866
Female	533	Female	190,233
<b>Literates</b>	<b>187,527</b>	<b>Literacy Rate (in %)</b>	<b>61.64</b>
Male	87,371	Male	58.14
Female	100,156	Female	65.06
<b>No. of Workers</b>	<b>154,180</b>	<b>Cultivators</b>	50,844 (32.98%)
Male	88,839	<b>Agricultural Labours</b>	35,766 (23.20%)
Female	65,341	<b>Household Industrial Workers</b>	2, 004 (1.30%)
<b>No. of Main Workers</b>	<b>110,617</b>	<b>Other Workers</b>	65,566 (42.53%)
<b>No. of Marginal Workers</b>	<b>43,563</b>		

*Source: Census of India, 2011 (District Handbook)*

As can be seen from district data above, 95% population is tribal. Although no physical interventions planned with community interface, these tribal areas and the ST households will be taken into account during the preparation of Emergency Action Plan for Myntdu Leshka Project.

### 3.4 CULTURAL ENVIRONMENT

As per list of National Monuments in Meghalaya and list of State Protected monuments in Meghalaya; the following are listed as protected monuments in Jaintia Hills District:

- Megalithic Bridge on the Um-Nyakaneth, between Jarem and Syndai, 5 kms from dam site.
- Megalithic Bridge known as Thluum-wi between Jowai and Jarain, Mawput, 12.5 kms from dam site.
- Tank, Syndai, 8 km from dam site.

All proposed rehabilitation work are limited to dam area only, hence, no impact on protected monuments is envisaged.

#### **4.1 SUB-PROJECT SCREENING**

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The subproject screening is undertaken following a three step screening methodology as described in ESMF. Process of risk /impacts identification is done using screening process considering the proposed interventions at each dam as provided in the Project Screening Template using first screening format (SF-1). Applicable interventions are further classified based on their location i.e. within dam area or outside the dam area. Each activity is reviewed for the applicability under-sub project, location of applicable activity and likely risks and impacts. The SF-1 format is used to ascertain the types of E&S risks for each of the proposed rehabilitation activity e.g. Risk/Impact on Water Quality, Fisheries, Conservation Area, Protected Area, Ecology, Physical Environment, Cultural Environment, Tribal Presence, Private Land/Assets/Encroachers/Squatters, Labour, Migrant Labour and GBV risks – each of these corresponding to the ESS 2-8.

The second format (SF-2) is used to assess the extent of risk/impact intensity for each of the identified E&S risk and is used to categorize the risk level as Low/Moderate/Substantial/ High. Finally, using a third E&S risk summary format (SF-3), the risk categories for all different types of E&S risk and impacts is summarized and the highest of the risk categories is assigned as overall risk category for the given Dam sub-project. Based on the above findings, the ESDD report recommends Risk category of the Dam sub-project – whether it is Low/Moderate/Substantial/High and types of instruments that need to be prepared as part of the ESMP along with the responsibilities and timelines.

Outcome of three stage screening exercise is discussed below.

**Step I Screening (using Form SF-1):** Sub-Project Component, Construction Support Preparatory Intervention related vs Nature of Risk/Impact

Screening indicated that most project components related activities are limited to within the dam area/premises. Due to nature of these activities, likely impacts will be on physical environment in terms of air pollution, noise pollution and waste generation. None of the proposed structural interventions involve acquisition of private land and/or private assets. These activities in no way cause restriction on access to land or use of resources by local communities and there is no economic displacement envisaged due to the sub-project. Activities interfacing with water bodies – river/reservoir will have risk of spillage of

chemicals, construction material, and debris leading to water pollution and impacts on fishes.

Pre-construction and construction stage major auxiliary or preparatory intervention are within dam area as well as beyond dam area. Deployment and haulage of heavy machinery, setting up of workshop, operation of concrete mixture and heavy pumps will be within dam area. Other activities such as labour camp and debris disposal will be beyond dam area. Activities involving machinery and equipment will have impacts on physical environment. Transportation of material, debris disposal and labour camp are likely to generate pollution and impact on physical environment.

Project will involve project managers and supervisors, contracted workers – these would also include migrant workers as all the required labour will not be fully supplied locally for a number of reasons, such as worker's unavailability and lack of technical skills and capacity. Construction contractors are expected to stay at/near dam, set up construction equipment and machinery near work location at pre-determined/approved sites. Influx of skilled migrant labour, albeit few in numbers, for construction works is likely. The labour will stay outside the dam premises; hence risk of SEA/SH is likely.

Emergency Action Plan, Early Warning System and Flood Forecasting System, etc. would be required to be prepared. In that case, project will reach out to the disadvantaged and vulnerable persons and groups and involve them mainly during implementation. During implementation of EAP, population in vulnerable areas under different release scenario will be identified and contacted through public consultation meetings. Communities will be made aware about the warning systems and do's and don't's during such scenarios.

Output of this screening is enclosed as **Annexure I**.

**Step II Screening (using Form SF-2):** All applicable activities identified as having potential risks/impacts that were identified through Step I screening, are further screened for associated sub-activity and evaluated for the extent of risk. Sub-activity's Risk/Impact intensity is further categorised as Low (L), Moderate (M), Substantial (S) or High (H) based on following criteria:

Low	:	Localized, Temporary and Negligible
Moderate	:	Temporary, or short term and reversible under control
Substantial	:	Medium term, covering larger impact zone, partially reversible
High	:	Significant, non-reversible, long term and can only be contained/compensated

Each activity may have different type of risks/impacts and magnitude of separate risk may vary, as analysed under SF2. In SF2, each proposed rehabilitation activity is assessed for the nature of risk on various components of environment and social (based on SF1, Column 5) and then each one of these is separately evaluated for level of risk as Low, Moderate, Substantial or High; the highest risk level is recorded in column 5 of SF2 for each activity.

Occupational Health and safety: OHS is a substantial risk activity in almost all cases and is not being considered under screening criteria. Occupational health and safety is considered an important requirement of every project irrespective of size and type of the projects. It will be part of Contractor's ESMP.

Analysis of extent of risk/impact for sub-activities resulted in identification of following activities as having Moderate Risks/impacts.

- Construction of Step Concrete Wall near Intake at Left Bank near Intake.
- Construction of Step Stone Masonry Wall above Staff Quarter near View Point and D.G. Set at Right Bank.
- Construction of Step Protection Wall below D.G. Set at Right Bank.
- Construction of Protection/Step Stone Masonry Wall in the Reservoir rim at Right Bank.
- Grouting in the Upstream face of the Dam Body and Second Stage concreting at Stop-Log groves.
- Cleaning of silt and sludge of Foundation Gallery and Sump-well.
- Curtain Grouting.
- Painting of all Radial gates including trunion, girder etc. with suitable rust preventive Epoxy Paint.
- Painting of Stop-log gate.
- Providing High Strength Concrete M90 in the Chute Spillway and Grouting on the Main Spillway and Chute Spillway.
- Construction of coffer bunds including making safe access approach road.
- Construction of Stepped breast wall to prevent erosion at CH. 9.45 - 9.95 km of road from Pdengshakap to Dam site.
- Construction of Stepped retaining wall to prevent soil erosion CH. 10.40 - 10.70 km of road from Pdengshakap to Dam site.

All other activities are categorized as low risk activities. E&S risks of none of the sub-activities for this sub-project is categorized as either Substantial or High risk. **The outcome of Screening is enclosed as Annexure II.** In case of GBV/SEAH, this site was assessed as Low risk. Based on consideration of all the above, summary of Risk/Impact (as per outcome of SF-2) is summarised for major sub-project activities under **Table 4.1 below.**

**Table 4.1: Summary of Identified Risks/Impacts in Form SF-3**

Project Activity	Environment Risks						Social Risks				
	Air, water, noise, land use, Soil, Resource use	Pollution downstream and upstream	General Ecology	Protected Area (Wild Life Sanctuaries, National Park and other natural habitat even if not protected)	Other RET species (flora and fauna) outside protected areas	Fish and Aquatic life within dam water body	Land	Tribal	Labour	Cultural heritage	GBV/SEAH
Civil (within Dam Boundary)	M	M	L	None	None	M	L	L	M	None	L
Hydro Mechanical	L	L	L	None	None	L	L	L	M	None	L
Instrumental SCADA, surveillance	L	L	L	None	None	L	L	L	L	None	L
Painting	L	M	L	None	None	L	L	L	L	None	L
Road work	M	L	L	None	None	L	L	L	M	None	L
Safety measures (Siren, Lighting)	L	L	L	None	None	L	L	L	L	None	L
Major Civil Work like Additional Spill Way	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Major Hydraulic Structure (tunnelling)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Major Civil Work extending beyond Dam Area Like training Structure	L	L	L	None	None	L	L	L	L	L	L
Additional activities for Tourism /Solar/Fisheries/ Water recreation enhancement	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

**Criteria for Risk Evaluation:**

**Low:** Localized, temporary and Negligible

**Moderate:** temporary, or short term and reversible under control

**Substantial:** medium term, covering larger impact zone, partially reversible

**High:** significant, non-reversible, long term and can only be contained/compensated

**Occupational Health and safety:** OHS is a substantial risk activity in almost all cases and is being treated separately through OHS plan in accordance with WB ESHS guidelines and shall be applicable to all sub-projects. Hence is not being considered under screening criteria.

## 4.2 STAKEHOLDER CONSULTATION

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Stakeholder consultations were conducted as part of environmental and social due diligence. The purpose was to:

- a. provide initial information to the communities on the proposed project interventions and particularly the non-structural interventions;
- b. help identify potential stakeholders who are involved at this stage and will be involved a later stage.
- c. ascertain if there are any legacy issues relating to displacement, resettlement, etc.
- d. elicit their responses in relation to key non-structural interventions such as early warning systems, emergency action plans
- e. identify mechanisms that would be deployed to engage with different stakeholders and particularly communities living downstream.

A stakeholder consultation meeting was conducted at dam site on 07/05/2020 and later at Inspection Bungalow on the same day itself. It was attended by permanent staff of the borrower (MePGCL) working at dam, contractors and local teacher. A formal stakeholder consultation meeting will be held post-Covid.



Following is the summary of outcome of the stakeholder consultation meetings:

1. The dam is main source of hydroelectricity to nearby villages, Meghalaya state and country as a whole, the participants expressed that improvement works shall be taken up.
2. Due to the increase of inflow water coming out from three rivers (Amshariang, Lamu and Myntdu) the participants opined that early warning and alerting measures be provided for at-least 30 minutes before opening the gate.
3. The dam is visited by many tourists and it is requested to provide safety and security measures including fencing, lighting.
4. The participants urged for immediate construction of quarters for security personnel as the present place is in dilapidated condition.
5. The MePGCL site engineers are fully aware of the interventions but need training on ESF and related standards.
6. No formal fishing is noticed.
7. The MePGCL team indicated the proposed labour camp site will be set up within the vacant area of the MePGCL site abutting the dam. The present land use is lying vacant.

8. The MePGCL office maintains RTI process through which the public is provided with requested information. The MePGCL will set up 3 levels of GRM for the project – at site, at MePGCL and at Power department, Govt of Meghalaya.

Communities welcomed such interactions and indicated that they would prefer Dam authorities conduct one such face -to- face meeting once a month at a convenient location to inform of developments/interventions relevant to them. They welcomed other means of information such as advertisements in the local papers etc, but preferred to have face to face interactions at least once a month.

Following is the outcome of the stakeholder consultation exercise. List of participants is enclosed as **Annexure III**.

#### A. Interaction with Dam Engineers/Staff

Questions	Responses provided / Observations
1. Please confirm whether all proposed structural rehabilitation activities for this dam are limited to dam compound only or any activities are proposed beyond dam complex like catchment area treatment plan, stabilization of reservoir rim area, slope stabilization, de-silting etc.? Please specify if any possibility of local community interference exist during the implementation of rehabilitation measures; including stakeholders consultation meetings planned for dissemination of emergency action plans which is a non-structural measure.	All proposed structural rehabilitation activities for this dam are limited to dam compound only.
2. Is there any unsettled issues (legacy) related to displacement or resettlement, pending since time of dam construction? If yes, please give a brief detail.	No.
3. Any unauthorized encroachers or squatters living within the dam premise? If yes, are these not a threat for dam security and dam premise, any official action taken in the past, does the state government have legalized these squatters and these have full right in the property of dam authorities.	No.
4. What is the proposed institutional arrangement to deal the Environment and Social activities within the scheme i.e. in-house team of experts/hired agency or individual experts?	Environment and Social activities will be taken care by the Department (MePGCL) in consultation with experts in the field of Environment and Social aspects.
5. Who will be in charge of E&S related activities at dam site and at SPMU level?	The Chief Engineer (HP&HC), MePGCL.
6. How do communities contact dam officials? Is there any existing mechanism known to communities to contact dam officials (through telephone/mobile/e-mail/official website)?	Yes (telephone/mobile).

7. What is existing mechanism to communicate with downstream communities/public on unregulated releases of water during high flood time siren/written communication to district authorities/ telephone/mobile/text messages or any other mode of communication?	Siren.
8. How do you ensure that downstream community is fully aware of the above existing mechanism?	As of now there is no settlement near the downstream river bank.
9. Are there women employees at the dam site?	No
10. Is there any existing Grievance Redressal Mechanism (GRM) within the department to address any kind of grievance/complaints by general public?	No formal system has been established for dealing with external complaint or a formal GRM
11. Details of any grievances received lately related to this new Scheme?	No
12. Is dam premise a restricted area or has open access to general public?	Open access to general public.
13. Are there tribal's living in the surrounding area of dam complex? Which tribes are these? Please give brief detail.	Yes. Khasi (Pnar Tribes) <sup>2</sup> .
14. Does the dam have any tourism/water recreation facilities? If yes, how many approximate tourist visits annually, annual revenue generated, whether any portion of this generated revenue is diverted to regular O&M of this dam.	No.
15. Do you engage any local labourers for routine dam maintenance work? If yes, what is the process of engaging these locals for work at dam, whether through Government approved contractor or hired individually?	Yes. Hired individually.

### B. Interaction with Local Community

Questions	Responses provided / Observations
1. How many villages are in immediate downstream vicinity?	No villages.
2. Are they dependent on dam in any way for their livelihood?	No
3. Does any of these villages were displaced and rehabilitated during the construction of Myntdu Leshka Dam. Is there any	No villages.

<sup>2</sup> TDP shall be prepared



pending compensation issues?	
4. Is there any R&R affected person known to you who is currently working with the dam authorities? If so, in what capacity (employee/direct worker/contractor)	No.
5. Are you aware of any fishing communities living immediately downstream of dam whose livelihood are directly linked with the fishing activities of this dam?	No
6. Are you aware of fishing working seasons, revenue earning, any access to general public for fishing, any suggestion etc?	No
7. Are you aware of local women affected in any way by dam operations?	No
8. Are you aware of any early flood warning system for this dam, or any other system wherein downstream communities getting regular update during flood season for any uncontrolled release of water?	No
9. Are you aware of any dam related incident happened in the past wherein some loss of life encountered? If yes, brief summary may be given	No
10. If you have to contact the dam authorities; how will you contact, through telephone/mobile/e mail/personally?	Mobile
11. In the past, on any occasion, did you contact dam authorities for any specific reason affecting public in general? If so, how did you contact and how was the response of dam authority?	No
12. Give your views about Myntdu Leshka dam, how this dam is helping Country, State, district or local communities in meeting its objectives, any specific concern can also be given?	1. Generation of Power to the GRID. It is also the big source of income to the State as it provides electricity to other States. 2. Benefits related to employment for local communities.
13. (a) Are you aware of any document named Emergency Action Plan (EAP) of the dam?	Yes
(b) If yes, do dam authorities conduct any annual mock drill or consultation meeting on dam site and invite all stakeholders to inform about various protocols in place and consequences in case dam fails?	Yes
(c) In future, during stakeholder's consultation meeting, would you like to be a part of these consultation and mock drill activities to be conducted by dam authorities?	Yes
(d) If yes, how to contact you, please give	Shri. Pher Massar (Contractor), Suchen Village, Mobile No: +91 8974344902, East Jaintia Hills District, Meghalaya.

the corresponding address along with all details to receive the official communication.	
14. Are you a regular follower of official website of dam authorities as a general public, in case you are a contractor, do you follow various tenders notices being invited for various maintenance of this dam?	Yes
15. Any suggestion to improve overall system by dam authorities in any way, please give in brief?	1. Improvement of Roads and Communication. 2. Providing of modern Instruments/ Surveillance Equipment and Flood forecasting System at Concrete Dam.

### 4.3 DESCRIPTIVE SUMMARY OF RISKS AND IMPACTS FROM ACTIVITIES BASED ON SCREENING

Based on the above screening analysis, potential impacts and risks from the sub-project are summarised below:

#### ***Environmental Impacts and Risks***

1. Environment risks and impacts, as assessed above, for various project activities under this sub-project are categorised as Low and Moderate due to localised nature of proposed activities i.e. activities remain limited to dam area except for labour camp and muck/debris disposal.
2. Execution of civil and hydro-mechanical work within dam body will generate localised impacts on physical environment and resource use; pose risk of exposure of workers requiring personal protective equipment (PPE) use.
3. Civil work interfaced with water body pose risk of water pollution and impact on fish fauna.
4. Construction waste and muck from development, require careful disposal at pre-identified and approved site to minimise the risk of pollution on this count.
5. No impact on general ecology is envisaged.
6. Rehabilitation work would require labour to work on various sections of dam involving working at height, working in confined spaces, working on reservoir side, etc; Further, workers will also be exposed to dust and noise and will have to handle chemicals/gases for some of the works; these will lead to occupational health and safety risks.

#### ***Social Impacts and Risks***

1. As the interventions are within the dam premises and on the dam structure, there shall be no adverse impacts on land and assets due to any sub-component or sub-activities
2. The dam is located in the Schedule VI area. Though there are Scheduled Tribes households in the vicinity, there will be no physical interventions. These areas and the ST households will be taken into account during the preparation of Emergency Action Plan for the Project.
3. Influx of migrant labour will be low as these works require only few but very skilled labour. Also, these workers will mostly operate from labour camps within the dam

premises/proximity and hence there would be minimal interface with communities and therefore significantly lower SEAH/GBV risks.

4. Waste generation from labour colony can pollute drinking water sources of community, risk is low and can be mitigated by providing adequate sanitation facilities.
5. No impacts are envisaged on cultural heritage as no such sites are identified in project vicinity.
6. Labour related risk would include:
  - Safety issues while at work like injuries/accidents/ fatalities leading to even death, while at work; Occupational health and safety risks due to exposure of workers to unsafe conditions while working at heights, working using lifts, handling of equipment and machinery, exposure to air and noise pollution etc. will be addressed through OHS guidelines.
  - Short term effects due to exposure to dust and noise levels, while at work
  - Long term effects on life due to exposure to chemical /hazardous wastes
  - Inadequate accommodation facilities at work force camp, including inadequate sanitation and health facilities
  - Sexual harassment at work
  - Absence or inadequate or inaccessible emergency response system for rescue of labour/workforce in situations of natural calamities.
  - Health risks of labour relating to HIV/AIDS and other sexually transmitted diseases
  - Non-payment of wages
  - Discrimination in Employment (e.g. abrupt termination of the employment, working conditions, wages or benefits etc.)
  - Unclear terms and conditions of employment
  - Discrimination and denial of equal opportunity in hiring and promotions/incentives/training opportunities
  - Denial for workers' rights to form worker's organizations, etc.
  - Absence of a grievance mechanism for labour to seek redressal of their grievances/issues

## 5.1 CONCLUSIONS

### 5.1.1 Risk Classification

As per the ESDD exercise, risk/impacts that have been identified relate to Water Quality, Physical Environment, labour and SEAH/GBV. The summarised environmental and social risks of identified activities with level of risk is presented in previous chapter. These risks are low to moderate and localised, short term and temporary in nature which can be managed with standard ESMP and guidelines. Environment risks of air, water, noise, land use, soil and resource use for most of the activities as well as social risks of labour to labour/community are Moderate. Environment risks of pollution downstream and upstream are categorised as Moderate for works interfacing with water body. Environmental risk relating to Labour camp has been flagged as Moderate on environment and land.

Hence the overall risk of this sub-project Dam is categorized as Moderate. OHS is a substantial risk activity and is being treated separately through OHS plan in accordance with WB ESHS guidelines.

### 5.1.2 National Legislation and WB ESS Applicability Screening

The applicability analysis of GOI legal and regulatory framework indicates that while, there are various legislation which will have to be followed by the contractor for the protection of environment, occupational health and safety of workers and protection of workers and employment terms. None of Indian legislation is applicable warranting obtaining clearance prior to start of construction/improvement work.

In addition to overarching ESS1, five ESS standards are found relevant to this sub-project as per reasons given in **Table 5.1** below:

**Table 5.2: WB ESF Standards applicable to the sub-project**

Relevant ESS	Reasons for Applicability of the standard
ESS2: Labour and Working Conditions	Due to engagement of Direct worker, Contracted workers and Community workers (likely for EAP and other non-structural interventions) for rehabilitation work
ESS3: Resource Efficiency, Pollution Prevention and Management	Civil and hydro-mechanical work including resource consumption; requiring protection of physical environment and conservation of resources
ESS 4: Community Health and Safety	Rehabilitation work, although limited to dam complex, can increase community exposure to risk and impacts; directly or indirectly.
ESS 7: Indigenous Peoples	Dam is located within Schedule VI areas – areas with preponderance of tribals/indigenous persons

Relevant ESS	Reasons for Applicability of the standard
ESS 10: Stakeholder Engagement Plan	For engagement of stakeholders in all structural and non-structural measures e.g. implementation of Early flood Warning system, siren systems, broadcasting facilities, Emergency Action Plan etc.

## 5.2 RECOMMENDATIONS

### 5.2.1 Mitigation and Management of Risks and Impacts

Since risks and impacts are low to moderate category, a standard ESMP customised to sub-project will be prepared in accordance with the ESMF. It shall cover the following aspects:

- a. SPMU shall customise the standard Environmental and Social Management plan (ESMP) that has been provided in the Environmental and Social Management Framework (ESMF) and make it part of bid document for effective adherence by contractors.
- b. ESMP will provide due measures for labour management and protection of environment quality and resource conservation (during handling of resources) in line with ESF standard ESS2 and ESS3 respectively. Likewise, due attention will be given to Occupational Health and Safety of workers and community in line with the requirements of ESS4 and World Bank Group guidelines on Occupational Health and Safety (OHS). SPMU/IA shall customise the standard ESMP in line with outline provided in the ESMF and ensure its adherence by contractor. The customised ESMP will address the following:
  - Gender Based Violence or SEA/SH related actions (ESS1)
  - Labour Management Procedure (ESS2)
  - Resource Efficiency and Pollution Prevention (ESS3)
  - Community Health and Safety (ESS4)
  - Tribal Development Plan (ESS7)
  - Stakeholders Engagement Plan (ESS10)
- c. Contractor shall submit BOQ as per ESMP of the sub project.

Mitigation plans to meet requirements for relevant Standards with responsibility and stages are given in **Table 5.2** below:

**Table 5.3: List of Mitigation Plans with responsibility and timelines**

WB-ESS Triggered	Mitigation Instrument	Responsibility	Timelines
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	<ul style="list-style-type: none"> <li>• Gender Based Violence or SEA/SH related actions</li> </ul>	SPMU/IA	Before mobilization of contractor
ESS2: Labour and Working Conditions	<ul style="list-style-type: none"> <li>• Labour Management Procedure (LMP) including OHS management plan</li> </ul>	SPMU/IA	Before mobilization of contractor
ESS3: Resource	<ul style="list-style-type: none"> <li>• Pollution Prevention</li> </ul>	SPMU/IA	Before mobilization of

<b>WB-ESS Triggered</b>	<b>Mitigation Instrument</b>	<b>Responsibility</b>	<b>Timelines</b>
Efficiency, Pollution Prevention and Management	and Environment Quality Management Plan (PPEQMP)		contractor
ESS 4: Community Health and Safety	<ul style="list-style-type: none"> <li>Community Health and Safety Management Plan (CHSMP)</li> </ul>	SPMU/IA	Before mobilization of contractor
ESS 7: Indigenous Peoples	<ul style="list-style-type: none"> <li>Tribal Development Plan</li> </ul>	SPMU/IA	Before mobilization of Contractor
ESS 10: Stakeholder Engagement Plan	<ul style="list-style-type: none"> <li>Stakeholder Engagement Plan</li> </ul>	SPMU/IA	By negotiation

ESDD and ESMP will be placed on the [www.damsafety.in](http://www.damsafety.in) website as well as other accessible locations such as the office of Engineer in Charge at Dam site as well at SPMU for reference and record. These documents would be disclosed/disseminated through other appropriate means like project meetings, workshops etc. Each IA will translate these documents in their local language, if required, and will upload in their respective websites and also make available at other accessible locations.

#### 5.2.2 Institutional Management, Monitoring and Reporting

ESMP will be customized for the sub project by SPMU/IA from standard ESMP included in ESMF and shall be shared with CWC by SPMU for their review/endorsement and approval before including in the bid document.

SPMU/IA will designate Nodal Officer(s) (full time in-house engineering staff with E&S expertise) to coordinate and supervise E&S activities. They shall be at the level of Executive Engineer/ Deputy Directors and shall provide commensurate time to comply with E&S related activities. Brief TORs for these Nodal E&S officers is included in ESMF. The SPMU, in case in-house expertise not available, will hire the qualified staffs on need basis to support management of E&S risks including Environmental and Social Experts for ensuring compliance with the Bank's ESF and ESS's and ensuring that these activities shall be implemented as per the procedures.

SPMU/IA shall advise contractors about applicable legislative requirements and ensure that contractors prepare its own ESMP (C-ESMP) as outlined in ESMP for this sub-project and submit compliance reports to SPMU/IA on quarterly basis. SPMUs will share regular implementation status of ESMPs to CWC and The World Bank in line with ESMF on quarterly basis.

SPMU/IA shall establish and operationalize a grievance mechanism to receive and facilitate resolution of complaints and grievances, from the communities and other stakeholders including implementation partners. GRM works within existing legal and cultural frameworks and shall comprise project level and respective State level redressal mechanisms. Most Project related grievances could be minor and site-specific.

EMC (Engineering and Management Consultant) for the project will have sufficient staff with skills on Environment and Social aspects. Awareness raising and capacity building on the new Environmental and Social Framework (ESF) need to be carried out for the environment and social staff engaged and this will be an area of continued focus, with a view to generate awareness at to dam level. EMC will develop formats for regular supervision and monitoring on E&S issues and undertake site visits/ inspections of the dam sites to monitor for compliance; collate and review QPRs and set up a monitoring and reporting system on E&S issues.

Overall, the proposed activities within this dam sub-project have low to moderate risks resulting in the overall sub-project to be categorized as Moderate risk category. These risks and impacts can be effectively mitigated with effective implementation of mitigation plans by SPMU/IA, Contractors and monitoring by EMC, SPMU and CWC.





## Annexure I: Form SF1

Sl. No	Project Component	Applicable (A), Not Applicable (NA)	Environment and Social Risk Associated within dam area (DI), Beyond Dam Area (DE)	Likely Nature of Risk/Impact Water Quality (WQ), Fisheries (F), Conservation Area (CA), Protected Area (PA), Ecological (E), Physical Environment (PE), Cultural (C), Tribal Presence (T), Impact on private land/assets/encroachers/squatters (LA), Labor (L), GBV risks (G), (Write whichever is applicable)
1	2	3	4	5
<b>A</b>	<b>Nature of Project Component and related sub activity Related</b>			
1	Reservoir Desiltation	<b>NA</b>		
2	Major structural changes – Spillway construction (Improving ability to withstand higher floods including additional flood handling facilities as needed.)	<b>NA</b>		
3	Structural strengthening of dams to withstand higher earthquake loads	<b>NA</b>		
4	Structural Improvement/Repair work - upstream of Dam site (interfacing dam reservoir) (like u/s face treatment etc.)	<b>A</b>	<b>DI</b>	<b>WQ, F, PE, L, G</b>
5	Structural Improvement/Repair work -Downstream of Dam site (with no interfacing with dam reservoir)	<b>A</b>	<b>DI</b>	<b>WQ, PE, L, G</b>
6	Re-sectioning earth dams to safe, stable cross sections	<b>NA</b>		
7	Hydro-mechanical activities with interface with dam reservoir	<b>A</b>	<b>DI</b>	<b>WQ, PE, L, G</b>
8	Hydro-mechanical activities Downstream of Dam site (with no interfacing with dam reservoir)	<b>A</b>	<b>DI</b>	<b>PE, L, G</b>
9	Instrumentation, General lighting and SCADA systems	<b>A</b>	<b>DI</b>	<b>PE, L, G</b>
10	Basic Facilities (like access road improvement, renovation of office, etc)	<b>A</b>	<b>DE</b>	<b>PE, L, G</b>
11	Utility installation like standby generator, or setting up solar power systems	<b>NA</b>		
12	Painting of dam u/s or d/s or both faces	<b>A</b>	<b>DI</b>	<b>WQ, F, PE, L, G</b>
13	Water recreation activities	<b>NA</b>		
14	Tourism Development	<b>NA</b>		
15	Installation of Solar power/floating solar	<b>NA</b>		
16	List any other component not listed above			
<b>B</b>	<b>Pre-construction and construction stage major auxiliary or preparatory intervention</b>			
1	Acquisition (diversion of forests land for non-forest purposes) of forest land	<b>NA</b>		

Sl. No	Project Component	Applicable (A), Not Applicable (NA)	Environment and Social Risk Associated within dam area (DI), Beyond Dam Area (DE)	Likely Nature of Risk/Impact Water Quality (WQ), Fisheries (F), Conservation Area (CA), Protected Area (PA), Ecological (E), Physical Environment (PE), Cultural (C), Tribal Presence (T), Impact on private land/assets/encroachers/squatters (LA), Labor (L), GBV risks (G), (Write whichever is applicable)
1	2	3	4	5
2	Acquisition of private land Resettlement and Rehabilitation (including physical or economic displacement/impact on livelihood;	NA		
3	Temporary loss of business or Damages to crops or trees or structures outside the ROW during Construction activities by Contractor	NA		
4	Borrowing earth to meet Borrow materials requirement	NA		
5	Sourcing of Quarry materials	NA		
6	Blasting	NA		
7	Setting up Labour Camps (location within dam premises or outside)	A	DE	WQ, PE, L, G
8	Heavy machinery deployment and setting up maintenance workshop	A	DI	PE, L, G
9	Setting up Hot mix plant	NA		
10	Deployment of Concrete mixture and heavy pumps	A	DI	PE, L, G
11	Temporary land acquisition	NA		
12	Need of Tree felling/ vegetation clearance	NA		
13	Disposal of large amount of Debris	A	DE	PE, L, G
14	Transport of large construction material	A	DE	PE, L, G
15	Utility shifting	NA		
16	Discharge of reservoir water (lowering of reservoir water involved)	NA		

**Note: Occupational Health and Safety aspects / impacts/ risks are considered important part of any dam project and this risk is separately classified. It shall be managed as per defined OH&S plans in every project irrespective of size and type of project.**

## Annexure II: Form SF2

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work-related Sub activity (As per SF-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L) , Moderate (M), Substantial (S), High (H)
1	2	3	4	5
A	Project Component Related			
1.	Structural Strengthening/Improvement/Repair work -upstream of Dam site			
a	<b>Reservoir</b> <ul style="list-style-type: none"> <li>• Construction of Step Concrete Wall near Intake at Left Bank.</li> <li>• Construction of Step Stone Masonry Wall above Staff Quarter near View Point and D.G. Set at Right Bank.</li> <li>• Construction of Step Protection Wall below D.G. Set at Right Bank.</li> <li>• Re-Construction of Grill Railing at Top of Retaining Wall constructed at the area of Masonry wall.</li> <li>• Construction of Protection/Step Stone Masonry Wall in the Reservoir rim at Right Bank.</li> </ul>	WQ, F, PE, L, G	Air pollution, noise pollution, risk of reservoir water contamination and impact on fishes, generation of construction debris, Labour and GBV risk	M
b	<b>Upstream Face</b> <ul style="list-style-type: none"> <li>• Grouting in the Upstream face of the Dam Body and Second Stage concreting at Stop-Log groves.</li> </ul>	WQ, F, PE, L, G	Air pollution, noise pollution, risk of reservoir water contamination and impact on fishes, generation of construction debris, Labour and GBV risk	M
c	Repairing of 2nd Stage Concrete in Block-Outs of Chute Spillway including Face Concreting over the existing eroded surface at Crest Level of Chute Spillway	WQ, PE, L, G	Risk of reservoir water contamination, generation of construction debris, labour and GBV risk	L
d	<b>Crest of Dam (Dam Top)</b> <ul style="list-style-type: none"> <li>• Topping with fresh Concrete Mix with Epoxy compound at Dam Top.</li> <li>• Providing Protection Railing at Block No. 18 &amp; 19.</li> <li>• Renovation of Dam Control room and Stairways including painting.</li> <li>• Extension the height of Cable Trench from D.G. Set to Dam Control Room upto Power Intake.</li> <li>• Watch Towers 2 Nos.</li> </ul>	PE, L, G	Impact on physical environment, Labour and GBV risk	L
2.	Structural Improvement/Repair work - Downstream of Dam site (with no interfacing with dam reservoir) (like repair of parapet walls, damage spillway crest, downstream training walls,			

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work-related Sub activity (As per SF-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L) , Moderate (M), Substantial (S), High (H)
1	2	3	4	5
	etc.)			
a	Construction of coffer bunds including making safe access approach road.	<b>WQ, PE, L, G</b>	Air pollution, noise pollution, water pollution, generation of construction debris, labour and GBV risk	<b>M</b>
b	Dewatering in the RCC Bucket Lip and Tail Pond.	<b>WQ, L, G</b>	Water pollution, Labour and GBV risk	<b>L</b>
c	Grouting in the downstream Second Stage Concreting of the Gate groove guides inc. Crack inside.	<b>WQ, L, G</b>	Water pollution, Labour and GBV risk	<b>L</b>
d	Curtain Grouting.	<b>PE, L, G</b>	Air pollution, noise pollution, water pollution, construction debris, Labour and GBV risk	<b>M</b>
e	Cleaning of silt and sludge of Foundation Gallery and Sump-well.	<b>PE, L, G</b>	Air pollution, noise pollution, silt disposal, Labour and GBV risk	<b>M</b>
<b>3.</b>	<b>Hydro-Mechanical activities Down - stream of Dam Site (with no interfacing with dam reservoir)</b>			
a	Repairing of cable tray from Dam Control Room to all power pack house.	<b>L, G</b>	Labour & GBV risk	<b>L</b>
b	<b>Spillway Gates (Radial Gates)</b> <ul style="list-style-type: none"> <li>Painting of all Radial gates inc. trunion, girder etc. with suitable rust preventive Epoxy Paint as Recommended by CWC.</li> <li>Painting of Stop-log gate.</li> </ul>	<b>WQ, PE, L, G</b>	Air pollution, water pollution, labour and GBV risk	<b>M</b>
c	Procurement, fixing and testing of Rubber Seals for all Gates.			
d	<b>Spillway Gates (Radial Gates)</b> <ul style="list-style-type: none"> <li>Changing of Trunion hubs including renovation of Trunion Assembly for all Radial Gates, Horizontal Plate Girder, fixed Seals of the Gates, Anchored etc.</li> <li>Providing Safety Railing and drilling of drain holes at horizontal girders inc Welding Works in the bottom most of Radial Gate's Arm.</li> <li>Providing Permanent Hoisting Arrangement for Motorize Operating for Chute Spillway Gate with Permanent Roofing, Safe Platform and Stairway.</li> </ul>	<b>L, G</b>	Labour & GBV risk	<b>L</b>
e	<b>Gallery/Shaft and Drainage (Concrete): Inspection Gallery</b> <ul style="list-style-type: none"> <li>Remaining of Uplift Pressure Pipe and Porous Pipe.</li> <li>Providing Lifting arrangement for Sump well</li> </ul>	<b>L, G</b>	Labour & GBV risk	<b>L</b>

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work-related Sub activity (As per SF-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L) , Moderate (M), Substantial (S), High (H)
1	2	3	4	5
	Pump and Protection Railing. <ul style="list-style-type: none"> <li>Supplying and installation of 30 HP Submersible Pump (Standby) with permanent pedestal inc. Piping System.</li> </ul>			
f	Repairing of Gallery drain inc. Hand Railing and making V-Notch inside the Gallery.	<b>WQ, L, G</b>	Water pollution, Labour & GBV risk	<b>L</b>
g	<b>Hoists and Operating Mechanisms</b> <ul style="list-style-type: none"> <li>Supplying of New Remote control panel at Control room for Radial Gates.</li> <li>Renovation and Testing of Local Control panel for Radial Gates at Power Pack and Testing of Motor and all other Components of Power Pack.</li> <li>Changing of Hydraulic Piping System for Gate No. 3, 4, 5, 6, &amp; 7 including Painting (with SS Pipe).</li> <li>Overhauling/Greasing of Rope of Gantry Crane including Painting.</li> </ul>	PE, L, G	Waste generation, Labour and GBV risks	<b>L</b>
h	<b>Spillway Bridge, Hoist Bridge, Trunnion Level Bridge Catwalks</b> <ul style="list-style-type: none"> <li>Providing Protection Pipe Railing at Piers.</li> <li>Repairing and Providing additional support of Spillway Bridge.</li> <li>Providing approach Stairway/Walkway to reach Bucket Lip.</li> </ul>	PE, L, G	Waste generation, Labour and GBV risks	<b>L</b>
i	<b>Chute Spillway</b> <ul style="list-style-type: none"> <li>Providing Drain Hole in the Chute Spillway Gate.</li> <li>Providing High Strength Concrete M90 in the Chute Spillway and Grouting on the Main Spillway and Chute Spillway.</li> <li>Making Platform and steps required to facilitate the people to reach the Spillway crest level.</li> </ul>	PE, L, G	Waste generation, Labour and GBV risks	<b>L</b>
j	<b>Chute Spillway</b> Providing High Strength Concrete M90 in the Chute Spillway and Grouting on the Main Spillway and Chute Spillway	<b>WQ, L, G</b>	Water pollution, Labour & GBV risk	<b>M</b>
k	<b>Approach Bridge, operation Platform and cabin (for intake/outlets)</b> <ul style="list-style-type: none"> <li>Providing Permanent Roofing with Safe Platform and Stairway at Power Intake and Construction of additional supporting pillar of steel deck bridge at Power Intake including Repainting of Steel deck Bridge of Intake Structure.</li> <li>Construction of Permanent hatch cover of</li> </ul>	PE, L, G	Air pollution, noise pollution, labour and GBV risk	<b>L</b>

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work-related Sub activity (As per SF-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L) , Moderate (M), Substantial (S), High (H)
1	2	3	4	5
	power Intake including bracing support and Painting of Intake gate including Hatch cover and Lifting beam at Power Intake.			
l	<b>Intake/Outlet Gates and Water Conveyance Structures.</b> <ul style="list-style-type: none"> <li>• Motorize operating arrangement 10 HP Motor for Emergency Gate.</li> <li>• Providing Side/Guide Plate in the Intake's Emergency Gate and Procurement of brake shoe of intake gate.</li> <li>• Under Water cleaning the trash rack bell mouth including painting.</li> </ul>	PE, L, G	Waste generation, Labour and GBV risks	L
4.	<b>Instrumentation, General lighting and SCADA systems</b>			
a	Surveillance equipments including Dam Instruments.	PE, L, G	Generation of waste material from packaging etc, Labour and GBV risk	L
b	High Mass Lighting on both side of the Abutments.	PE, L, G	Generation of waste material from packaging etc, Labour and GBV risk	L
c	<b>Electrical</b> <ul style="list-style-type: none"> <li>• Repairing HPSV/MH fitting junction boxes and associated auxiliaries to replace the damaged top lantern poles and fixture.</li> <li>• Repairing of Internal Electrification with water proof wire, socket, switch, MCB, etc. inside gallery.</li> <li>• Repairing of illumination system in the walkway Down Stream of the Dam.</li> </ul>	PE, L, G	Air pollution, Noise pollution, Generation of waste material from packaging etc, Labour and GBV risk	L
5	<b>Basic Facilities Improvement</b>			
a	<b>Basic Dam Facilities</b> <ul style="list-style-type: none"> <li>• Construction of RCC Building for Site and Security Personnel at Dam Site.</li> <li>• Construction of Security Shed at Left Bank at Dam Site.</li> <li>• Extension of D.G. Set Control Room.</li> <li>• Construction of Roof Covering for 250KVA D.G. Set with Protection Railing.</li> <li>• Painting of Roof Covering of D.G. Set 320 KVA and Protection Railing.</li> <li>• Construction of Drinking Water Source at Dam Site.</li> </ul>	PE, L, G	Air and noise pollution, Generation of construction/excavation debris/muck, Labour and GBV risk	L

Sl. No	Applicable Sub-Project Component/ Construction preparatory Work-related Sub activity (As per SF-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L) , Moderate (M), Substantial (S), High (H)
1	2	3	4	5
	<ul style="list-style-type: none"> <li>Construction of Drinking Water Storage Tank and Pipe Line from storage Tank to Dam Control Room.</li> <li>Extension the height of Cable trench from D.G. Set to Dam Control Room up to Power intake.</li> <li>Dismantling of Existing Stone Masonry Guard Wall and Providing new Pipe Railing at Right Bank of Dam.</li> <li>Repairing of Existing Side Drain and Masonry wall at Right Bank of Dam.</li> <li>Painting of Water Level Pillar at both Left and Right Bank Pillar.</li> <li>Providing Pipe Line water for water supply from source to Staff quarter and Control Room.</li> <li>Supplying of Office Equipment's (LED, Computer, Printer, Plotter Machine, Xerox Machine, Digital Board Furniture, Office Furniture etc.).</li> <li>Providing and fixing Sign Board/Name Plates showing the salient features of project.</li> <li>Providing RCC Pedestal for 320 KVA D.G.</li> <li>Turfing on both side of the Downstream.</li> <li>Renovation of the site offices and inspection bungalow</li> </ul>			
b	<b>Access Road</b> <ul style="list-style-type: none"> <li>Metalling including Black Topping of a Road along the Pdengshakap to Damsite CH.0.00 – 11.00 KM.</li> <li>Metalling including Black Topping at Inspection Bungalow CH.0.00 – 150.00 M.</li> </ul>	PE, L, G	Air and noise pollution, Generation of construction/excavation debris/muck, Labour and GBV risk	L
c	<b>Access Road</b> <ul style="list-style-type: none"> <li>Construction of Stepped breast wall to prevent erosion at CH.9.45-9.95KM of road from Pdengshakap to Damsite.</li> <li>Construction of Catch water drain at CH.9.50-9.90KM of road from Pdengshakap to Damsite.</li> <li>Construction of Stepped retaining wall to prevent soil erosion CH.10.40-10.70KM of road from Pdengshakap to Damsite.</li> </ul>	PE, L, G	Air and noise pollution, Generation of construction/excavation debris/muck, Labour and GBV risk	M
B.	Pre-construction and construction stage major auxiliary or preparatory intervention			



Sl. No	Applicable Sub-Project Component/ Construction preparatory Work-related Sub activity (As per SF-1)	Nature of Risk (Conforming to Column 5 of SF-1) and nature of sub activity	Elaborate cause (risk) and its effect (Impact) on environment /social	Risk/Impact intensity for each type of risk/impact Low (L) , Moderate (M), Substantial (S), High (H)
1	2	3	4	5
1	Setting up Labour Camps (location within dam premises or outside)	<b>WQ, PE, G</b>	Wastewater generation from domestic activities, waste generation, GBV risk within labour and involving community.	<b>M</b>
2	Heavy machinery deployment and setting up maintenance workshop	<b>PE, L, G</b>	Heavy machinery will be deployed for repair and maintenance of hoists and for other activities - risk due to machine handling, waste, wastewater and air emissions from machines operations, hazardous waste generation from oil waste	<b>L</b>
3	Deployment of concrete mixture and heavy pumps	<b>PE, L, G</b>	Concrete mixture and pumps will be deployed for road repair and other civil works and dewatering - risk due to machine handling, waste generation, wastewater and air emissions from operations, hazardous waste generation from oil waste, Labour and GBV risks	<b>L</b>
4	Disposal of large amount of Debris	<b>PE, L, G</b>	Debris will be generated from various repair activities, risk during debris handling, air and noise emissions from debris handling and transportation, water pollution risk due to debris finding its way to water body, and GBV risk due to labour involvement	<b>M</b>
5	Transport of large construction material	<b>PE, L, G</b>	Material will be transported from various vendors and suppliers to site for civil, hydro-mechanical work and instrumentation, air and noise emissions from transportation, Labour and GBV risk	<b>L</b>

**Criteria for Risk Evaluation:**

**Low:** Localized, temporary and Negligible

**Moderate:** temporary, or short term and reversible under control

**Substantial:** medium term, covering larger impact zone, partially reversible

**High:** significant, non- reversible, long term and can only be contained/compensated

**Occupational Health and safety:** OHS is a substantial risk activity in almost all cases and is being treated separately through OHS plan in accordance with WB ESHS guidelines and shall be applicable to all sub-projects. Hence is not being considered under screening criteria.

### Annexure III: Stakeholder's Consultation - List of Participants

Sl. No.	Name	Relation with Dam – Staff, contractor, worker, full time/part time, local, NGO....	Mobile Number	Address (at least village name)
1	Shri Pher Massar.	Contractor	8974344902	Suchen Village, East Jaintia Hills District, Meghalaya.
2	Smti Thimi Langshiang	Contractor	8415886780	Pdengshakap Village, West Jaintia Hills District, Meghalaya
3	Shri A Kassar.	Contractor	8837005650	Pdengshakap Village, West Jaintia Hills District, Meghalaya
4	Smti Rilang Khyriem	Contractor		Pdengshakap Village, West Jaintia Hills District, Meghalaya
5	Shri Diverland Lyngdoh	Contractor	9436102397	Lumkshaid, Mawprem Shillong East Khasi Hills, Meghalaya.
6	Smti Siang Myrchiang	Contractor		Nongtalang Village, West Jaintia Hills District, Meghalaya.
7	Smti Hila Mannar	Teacher		Thangbuli Village, West Jaintia Hills District, Meghalaya.
8	Shri B.M War	Superintending Engineer (C)	8256999704	Umpling, Shillong, East Khasi Hills District, Meghalaya.
8.	Shri C.Mukhim	Executive Engineer (C)	7005732356	Padu Village, West Jaintia Hills District, Meghalaya.
9	Shri D S Lyngdoh.	Assistant Executive Engineer (C)	8787835459	Mawkdok Village, East Khasi Hills District, Meghalaya
10.	Shri Kmenlang Shabong	Assistant Executive Engineer (C)	9366049104	Laitlyngkot Village, East Khasi Hills District, Meghalaya
11.	Shri Steven Wanshong	Assistant Executive Engineer (EI)	8787640177	Laitumkhrah, Shillong, East Khasi Hills District, Meghalaya