



**SIX-MONTHLY COMPLIANCE REPORT**

of

**ENVIRONMENT CLEARANCE**

(No. J-12011/26/2012-IA-I dated 4th September, 2019)

for

**LOWER KOPILI HYDRO ELECTRIC PROJECT (120 MW), ASSAM**

TO

**MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE,**

IA.I Division, Indira Paryavaran Bhawan, 3<sup>rd</sup> Floor, Vayu Wing, JorBagh Road,  
New Delhi - 110 003

**SUBMITTED BY**

**ASSAM POWER GENERATION CORPORATION LIMITED**

November, 2022

## Compliance of stipulated conditions of Environmental Clearance

Sl. No.	EC conditions	Status of Compliance
<b>Specific Conditions</b>		
<b>I</b>	The Environmental Management Plan (EMP) shall be strictly adhered to and a sum of Rs.26147.5077 lakhs (Capital cost: 15427.689 lakhs & Recurring cost: Rs. 10117.817 lakhs), the budgetary provisions for implementation of EMP, shall be fully utilized and not to be diverted to any other purpose. In case of revision of the project cost or due to price level change, the cost of EMP shall also updated proportionately.	Agreed.
<b>II</b>	The project proponent shall comply with the provisions contained in this Ministry's OM vide F. No.22-6512017-IA.III dated 1 <sup>st</sup> May 2018 regarding Corporate Environment Responsibility. Project proponent shall require to invest Rs 5.81 crore for CER activities as submitted to the Ministry. A total budget of Rs. 5.81 crore shall be spent for upgradation of education facilities in existing schools (Rs. 66.0 lakhs), construction of community toilets (Rs.380.0 lakhs), upgradation of Health care facilities (Rs. 115.0 lakhs) and awareness generation (Rs 20.0 lakhs). The entire activities under CER shall be treated as project and shall be monitored. The monitoring report shall be submitted to the regional office as a part of half-yearly compliance report and to a District Collector.	<p>Committee has been constituted to implement the CER and LAD on 07.02.2022 and on 11.11.2022. <a href="#">Annexure-1</a></p> <p>Both the committee will coordinate the implementation of CER and Local Area Development.</p> <p>Implementation initiated.</p>
<b>III</b>	The environmental clearance is valid for period of 10 years from the date of issue of this letter for commissioning of the project.	Agreed
<b>IV</b>	After 5 years of the commissioning of the project, a study shall be undertaken regarding impact of the project on the environment and downstream ecology. The study shall be undertaken by an independent agency, decided in consultation with the Ministry.	Agreed
<b>V</b>	Any other clearances/permissions/approvals from any other organization/department, as applicable to the project shall be taken.	Agreed
<b>VI</b>	PP shall procure construction material only from those Govt./Pvt. Agencies/Corporations/etc. that are having all applicable legal/statutory clearances/permissions or necessary permission to be obtained for quarrying construction materials for the project as per the EIA Notification, 2006 and subsequent amendments thereof.	Minor minerals are taken from the Govt. approved agencies. For extraction of aggregates, quarry area of 4.61 Ha has been identified and necessary clearances and permissions from North Cachar Hills Autonomous Council, Directorate of Geology and Mines, Forest Department has already been taken. Mostly the aggregates are being taken from the excavated materials only. <a href="#">Annexure 2.</a>
<b>VII</b>	Based on the recommendation of Cumulative Impact Assessment and Carrying capacity study of river basin or as per the ToR conditions or minimum 15% of the average flow of four consecutive leanest months or as submitted in the EIA/EMP report, whichever value is higher, shall be released as environmental flow.	Agreed

Sl. No.	EC conditions	Status of Compliance
<b>Standard conditions of Environmental Clearance</b>		
<b>I. Statutory compliance:</b>		
i	The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.	<ul style="list-style-type: none"> <li>• Stage-I Forest Clearance accorded by MoEF &amp; CC, New Delhi on 5th February, 2019.</li> <li>• Stage-II Forest Clearance accorded by MoEF &amp; CC, New Delhi on 04<sup>th</sup> December, 2020. <b>Annexure -3</b></li> </ul>
ii	The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.	Not Applicable. There is no Wildlife Sanctuary or National Parks within 10 km radius of the project site.
iii	The project proponent shall prepare a Site-Specific Conservation Plan & Wildlife Management Plan and approved by the Chief Wildlife Warden, if applicable. The recommendations of the approved Site-Specific Conservation Plan / Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six- monthly compliance report, (in case of the presence of Schedule-I species in the study area).	<p>Site Specific Conservation Plan and Wildlife Management Plan submitted to Chief Wildlife Warden, Assam on 25.6. 19. <b>Annexure -4</b></p> <p>Biodiversity Management Committee has been constituted for implementation of the Wildlife Management Plan on 12.10.2022. <b>Annexure -5</b></p>
iv	The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State Pollution Control Board/ Committee.	<p>Agreed.</p> <p>Package 2 Contractor has obtained the CTE and CTO for Crusher, 4 nos of DG sets and Batching Plant along with 4 nos of DG sets. CTO for crusher and DG sets obtained on 7/12.2021 vide Ref no. WB/SLC/T-1184/21-22/09/1152 and CTO for batching plant and DG sets obtained on 27/12.2021 vide Reference No. WB/SLC/T-1191/21-22/17.</p> <p>Package 2 Contractor has obtained the following CTOs.  <b>(Annexure -6</b> CTO for Batching Plant near power house &amp; 4 DG sets.  <b>Annexure -7</b> CTO for Crusher and 4 DG sets).  <b>Annexure -8</b> CTO for Batching Plant (Dam) and 4 DG sets.  CTE will be obtained before construction of the 120 MW power generating plant.</p>
v	NOC shall be obtained from National Commission of Seismic Design Parameters (NCSDS) of CWC.	Obtained and already submitted.
vi	Necessary approval of CEA shall be obtained for those projects having the project cost more than Rs. 1,000 crore.	Obtained and already submitted.
<b>II. Air quality monitoring and preservation</b>		

Sl. No.	EC conditions	Status of Compliance
i	Regular monitoring of various environmental parameters viz., Water Quality, Ambient Air Quality and Noise levels as per the CPCB guidelines at designated locations shall be carried out on monthly basis and a detailed database of the same shall be prepared and recorded. This shall be used as a baseline data for post construction EIA / Monitoring purposes.	Regular monitoring done at project site at various sampling stations as mentioned in the EMoP (Environmental Monitoring Reports are enclosed in <a href="#">Annexure-9</a> . The monitoring were carried out by MoEF &CC recognized Lab). 
ii	Appropriate Air Pollution Control (APC) system shall be provided for all the dust generating points including fugitive dust from all vulnerable sources, so as to comply prescribed standards.	Regular monitoring done at project site. Adequate spraying of water in roads and dust control measures has already been installed in respective dust generation site.
iii	Necessary control measures such as water sprinkling arrangements, etc. bet taken up to arrest fugitive dust at all the construction sites.	Regular monitoring done at project site and water sprinkling done. 
<b>III. Water quality monitoring and preservation</b>		
i	Before impounding of the water, Cofferdams for both at the upstream and downstream are to be decommissioned as per EIA/EMP report so that once the project is commissioned; cofferdam should not create any adverse impact on water environment including the rock mass and muck used for the Cofferdam.	Agreed.
ii	Water depth sensors shall be installed at suitable locations to monitor e-flow. Hourly data to be collected and converted to discharge data. The Gauge and Discharge data in the form of Excel Sheet is submitted to the Regional Office, MoEF & CC and to the CWC on weekly basis.	Regular recording of discharge data were taken from Kopili river. In this reporting period discharge data could not be recorded as the gauze was washed away by the recent flood. Procurement of automatic real-time sensor to collect data on water inflow and out flows from the hydropower dam is under process.

Sl. No.	EC conditions	Status of Compliance
<b>IV. Noise monitoring and prevention</b>		
i	All the equipment likely to generate high noise shall be appropriately enclosed or inbuilt noise enclosures be provided so as to meet the ambient noise standards as notified under the Noise Pollution (Regulation and Control) Rules, 2000, as amended in 2010 under the Environment Protection Act (EPA), 1986.	<p>Agreed. All the DG sets are with acoustic enclosures.</p> 
ii	The ambient noise levels should conform to the standards prescribed under E(P)A Rules, 1986 viz. 75 dB(A) during day time and 70 dB(A) during night time.	Monitoring reports are enclosed in <b>Annexure 9</b> and complied the Ambient Noise level standards.
<b>V. Catchment Area Treatment Plan</b>		
i	Catchment Area Treatment (CAT) Plan as proposed in the EIA/EMP report shall be implemented in consultation with the State Forest Department and shall be implemented in synchronization with the construction of the project.	An Amount of Rs. 28, 29, 67,000.00 (Rupees Twenty Eight Crore Twenty Nine Lakh Sixty Seven Thousand) only already paid to Forest Department for implementation of Catchment Area Treatment Plan (CATP). APGCL is pursuing with Forest Department for implementation. At present implementation of the CAT plan is included in the APO 2022-2023 as informed. Implementation report from the State Forest Department not yet received.
<b>VI. Waste management</b>		
i	Muck disposal be carried out only in the approved and earmarked sites. The dumping sites shall be located sufficiently away from the HFL of the river. Efforts be made to reuse the muck for construction and other filling purposes and balanced be disposed of at the designated disposal sites. Once the muck disposal sites are inactive, proper treatment measures like both engineering and biological measures be carried out so that sites are stabilized quickly.	At present dumping of excavated earth in 4 locations in Revenue land are going on. Once the muck disposal sites are inactive, proper treatment measures like both engineering and biological measures will be carried out so that sites are stabilized quickly.
ii	Solid waste management should be planned in details. Land filling of plastic waste shall be avoided and instead be used for various purposes as envisaged in the EIA/EMP reports. Efforts be made to avoid one time use of plastics.	Agreed. SWM plan submitted to APGCL by package 2 contractor. At present segregation is going on at source and composting process is undertaken at site. Recyclable wastes are taken by vendors.
<b>VII. Green Belt, EMP Cost, Fisheries and Wildlife Management</b>		
i	Detailed information on species composition particular to fish species from previous study/literature be inventoried and proper management plan shall be prepared for in situ conservation in the streams, tributaries of river and the main river itself for which adequate budget provision be made and followed strictly.	Agreed. Downstream river ecology study will be conducted shortly to update the baseline information and plan will be updated accordingly. Due to the nonoperational two upstream power projects downstream study was postponed.

Sl. No.	EC conditions	Status of Compliance
ii	Wildlife Conservation Plan prepared for both core and buffer zones shall be implemented in consultation with the local State Forest Department, if applicable.	<p>Conservation Plan for Flora and Fauna (Biodiversity) has already been submitted to Forest Department for implementation. <a href="#">Annexure 10</a>.</p> <p>Biodiversity Management Committee has been constituted for implementation of the plan. <a href="#">Annexure 5</a>.</p>
iii	To enrich the habitat of the project site, plantation shall be raised as envisaged in the EIA/EMP report. Plantation to be developed along the periphery of the reservoir in multi-layers with local indigenous species in consultation with the local State Forest Department.	<p>Agreed.</p> <p>Plantation already initiated.</p>  <p>Plantation in the periphery of the reservoir will start soon.</p>
iv	Compensatory Afforestation programme shall be implemented as per the plan approved.	<p>Agreed.</p> <p>An amount of Rs. 15, 94, 23,850.00 (Rupees Fifteen Crore Ninety Four Lakh Twenty Three Thousand Eight Hundred Fifty) plus overhead only already paid to Forest Department for Compensatory Afforestation (CA) in CAMPA head. The 8 patches of Revenue land has already been notified as Reserved Forest by Govt. of Assam.</p>
v	Fish ladder/pass as envisaged in the EIA/EMP report shall be maintained for migration of fishes. Regular monitoring of this facility be carried out to ensure its effectiveness.	As the river water is acidic in nature, during the EIA study no fish ladder / pass was proposed. Hence Fish ladder/pass is not considered in this project.

Sl. No.	EC conditions	Status of Compliance
<b>VIII. Public hearing and Human health issues</b>		
i	Resettlement & Rehabilitation plan be implemented in consultation with the State Govt. as approved by the State Govt., if any.	Agreed. Implementation is going on.
ii	Budget provisions made for the community and social development plan including community welfare schemes shall be implemented in to.	Agreed. Local Area Development Plan will be implemented as per plan.
iii	Preventive measures viz. fuming and spraying of mosquito control shall be done in and around the labour colonies, affected villages, stagnated pools, etc. Provisions be made to not to create any stagnated pools to avoid creation of breeding grounds of the vector borne diseases.	Agreed. Package 2 contractor has already taken up appropriate measures to control mosquitos.
iv	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.	<p>Agreed. Package 2 contractor has already constructed labour camps with he following facilities like - common kitchen, Sanitary and mobile toilets, safe drinking water, medical health care, etc.</p> <p>Camp</p>  <p>25-Nov-2022 13:37:09 25°40'53.094"N 92°48'8.73936"E NH627, Assam 788832, India</p> <p>Staff Canteen</p>  <p>25-Nov-2022 13:37:40 25°40'52.96004"N 92°48'8.42918"E NH627, Assam 788832, India</p>  <p>06-Dec-2022 13:13:39 25°40'56.02195"N 92°48'7.82896"E</p>

Sl. No.	EC conditions	Status of Compliance
		
v	<p>Labour force to be engaged for construction works shall be examined thoroughly and adequately treated before issuing them work permit. Medical facilities shall be provided at the construction sites.</p>	<p>Medical facility (First Aid Center) provided by the contractor at site.</p>  <p>COVID Vaccination at First Aid Center</p>
vi	<p>Early Warning Telemetric system shall be installed in the upper catchment area of the project for advance intimation of flood forecast.</p>	<p>At present Early warning is given by district administration Disaster Management Cell and discharge data is shared by NEEPCO project authority located upstream. Project specific Early Warning Telemetric system will be installed before impounding of water.</p>
vii	<p>Emergency preparedness plan be made for any eventuality of the dam failure and shall be implemented as per the Dam Break Analysis</p>	<p>Agreed. The Disaster Management Plan is prepared.</p>
<b>IX. Corporate Environment Responsibility</b>		
i	<p>The project proponent shall comply with the provisions contained in this Ministry's OM vide F.No. 22-65/2017-IA.III dated 01.05.2018, as applicable, regarding Corporate Environment Responsibility.</p>	<p>Agreed. Now will be covered under EMP as per OM of MoEF&amp;CC. Moreover, there is also similar provisions in Local Area Development Fund under CRTDP. Activities will be carried out in phase manner.</p>
ii	<p>Skill mapping be undertaken for the youths of the affected project area and based on the skill mapping, necessary trainings to the youths be provided for their long time livelihood generation</p>	<p>Agreed. NGO has been recruited for various activities including skill mapping. First phase of Training plan has also been submitted to APGCL for approval.</p>

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iii	The PP shall have a well laid down environmental policy duly approved by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms / conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stakeholders. The copy of the board resolution in this regard shall be submitted to the MoEF&CC as a part of six-monthly report.	Agreed.
iv	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.	A separate Environmental Cell both at the project and company head quarter level, with qualified personnel are in place.
v	Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to the Ministry/Regional Office along with the Six Monthly Compliance Report.	Agreed and initiated.
vi	Post EIA and SIA be prepared for the project through a third party and evaluation report be submitted to the Ministry after five years of commissioning of the project.	Agreed. Will be carried out after 5 years of commissioning of the project.
vii	Multi-Disciplinary Committee (MDC) be constituted with experts from Ecology, Forestry, Wildlife, Sociology, Soil Conservation, Fisheries, NGO, etc. to oversee implementation of various environmental safeguards proposed in EIA/EMP report during construction of the project. The monitoring report of the Committee shall be uploaded in the website of the Company.	Agreed and is in place. 1 <sup>st</sup> MDC meeting was convened on 6 <sup>th</sup> May, 2022. Minutes of the meeting is in <b>Annexure 11</b> .
<b>X. Miscellaneous</b>		
i	The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by 5 prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.	Already done. <b>Annexure -12</b> Copy of EC in the APGCL site : <a href="https://www.apgcl.org/lkhep.php">https://www.apgcl.org/lkhep.php</a>
ii	The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.	Already done.
iii	The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.	Agreed and posted. Displayed in the APGCL site : <a href="https://www.apgcl.org/lkhep.php">https://www.apgcl.org/lkhep.php</a>

Sl. No.	EC conditions	Status of Compliance
iv	The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.	Agreed and submitted every six months.
v	The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.	<u>Agreed.</u>
vi	The project proponent shall inform the Regional Office as well as the Ministry, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.	Agreed.
vii	The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.	Agreed.
viii	The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the Expert Appraisal Committee.	Agreed.
ix	No further expansion or modifications in the plant shall be carried out without prior approval of the Ministry of Environment, Forests and Climate Change (MoEF&CC).	Agreed. During the detail designing and execution of the EPC contract minor adjustments were made with the approval from Central Electricity Authority, Central Water Commission, Geological Survey of India, Central Soil and Material Research Station, GOI keeping the power generation capacity of 120 MW, location of the Dam Axis, FRL of 226m, alignment of HRT remaining same as mentioned in the EC. Letter has been sent from APGCL to The Director, IA-I Division, MoEF&CC, GOI for appraisal along with the copy of the MOC received from CEA, GOI with justifications vide letter no APGCL/CGM(H)/W/2007/140/Pt-VI/54 dated 28.11.2022 is enclosed for ready reference. <a href="#">Annexure 13.</a> Project layout. <a href="#">Annexure 14</a>
x	Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.	Agreed.
xi	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.	Agreed.
xii	The Ministry reserves the right to stipulate additional conditions if found necessary. The Company in a time	Agreed.

Sl. No.	EC conditions	Status of Compliance
	bound manner shall implement these conditions.	
xiii	The Regional Office of this Ministry shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information/monitoring reports.	Agreed.
xiv	The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.	Agreed.
xv	Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.	Agreed.

**ANNEXURES : 1 - 14**

Annexure -1 : CER implementation Committee & CRTDP implementation Committee.



**ASSAM POWER GENERATION CORPORATION LIMITED**

Registered Office: Bijulee Bhawan, 3<sup>rd</sup> floor, Paltanbazar, Guwahati-781 001, Assam

Sri. Mridul Saikia

Project Director (PMU)

LOWER KOPILI HYDRO ELECTRIC PROJECT

E-mail: projectdirector@apgcl.com

No: APGCL/CGM(H)/W/2007/140/Pt-VI/43

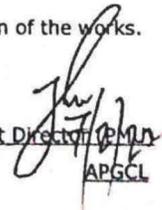
Dated: 07/02/2022

**OFFICE ORDER**

In the interest of works, a committee is hereby constituted to supervise the works and determine the fund source for executing the works related to Corporate Environment Responsibility (CER), Conservation Plan for Schedule I Species under Environment Management Plan (EMP) and Local Area Development under Combined Resettlement and Tribal Development Plan (CRTDP) w.r.t Lower Kopili H.E. Project. The committee shall execute the works as per the regulations of Ministry of Environment, Forest & Climate Change (MoEF&CC) Govt. of India, Ministry of Tribal Affairs (MoTA) Govt. of India and Asian Development Bank (ADB). The committee shall comprise of the following members:

SL. No:	Members	Designation
1.	Th S. Singha, GM (PP&I), O/o the CGM (PP&I), APGCL	Head of the Committee
2.	Sri Saurav Saikia, GM (Civil) i/c, O/o the CGM (H&C), APGCL	Member
3.	Ph A. Singha, DGM (Civil), O/o the CGM (PP&I), APGCL	Member, Convenor
4.	Sri. A. Talukdar, DGM, O/o the CGM (PP&I), APGCL	Member
5.	Sri. M.J Pandit, AGM (Civil), O/o the CGM (PP&I), APGCL	Member
6.	Sri. P.J. Ligira, DM (ECE), O/o the GM, LKHEP, APGCL,	Member
7.	Sri. Gunjan Kr. Nath, JM (Civil), O/o the CGM (H&C), APGCL	Member
8.	Sri. A.J Pathak, AM (F&A), O/o the CGM (F&A), APGCL	Member
9.	Sri. Pankaj Hazarika, Social Safeguard Expert, APGCL	Member
10.	Dr. Deepak Baruah, Environmental Expert, APGCL	Member

The committee will be assisted by the PMC for LKHEP in the execution of the works.

  
Project Director (PMU)  
APGCL

Copy to:

1. The OSD to the Chairman, APGCL, for kind information of Hon'ble Chairman.
2. The P.S. to Managing Director, APGCL, for kind information of Hon'ble MD.
3. The General Manager, Lower Kopili H.E. Project, Longku, for information.
4. The Team Leader, LKHEP, AFRY Ltd. for information and necessary action.
5. The Officers concerned.
6. Relevant file.



# ASSAM POWER GENERATION CORPORATION LIMITED

Registered Office: Bijulee Bhawan, 3<sup>rd</sup> floor, Paltanbazar, Guwahati-781 001, Assam

**Mridul saikia**  
Chief General Manager (PP&I)  
Project Director (PMU)  
E-mail : [mridul.saikia@apgcl.org](mailto:mridul.saikia@apgcl.org)

No: APGCL/LKHEP/PD/2017-18/21/Part-I/Part file-1/126

Dated: 11.11.2022

## **OFFICE ORDER**

A Co-ordination Committee is hereby constituted for Lower Kopili Hydro Electric Project to facilitate consultation between Affected Peoples (APs), APGCL, District Council and NGO for discussion of APs problem regarding Land Acquisition, Rehabilitation & Resettlement and other aspects relating to Livelihood restoration and hence smooth implementation of CRTDP with the following members:

1. CGM (PP&I) APGCL- **Chairman**
2. GM LKHEP APGCL- **Member Convener**
3. GM (PP&I) APGCL- **Member**
4. DGM (Civil) LKHEP APGCL- **Member**
5. Social Safeguard Expert APGCL- **Member**
6. Environment Expert APGCL- **Member**
7. Social & Resettlement Expert PMC- **Member**
8. NGO CRADLE & GUS representative- **Member**
9. District Council Authority representative from Dima Hasao- **Member**
10. District Council Authority representative from Karbi Anglong- **Member**
11. Affected Peoples Representative- **Member**

NGO will facilitate consultation between the APs, APGCL and District Councils at the field offices and with the APs as and when required to discuss the implementation of CRTDP.

  
Chief General Manager (PP&I)  
APGCL

Dated: 11.11.2022

Memo No: APGCL/LKHEP/PD/2017-18/21/Part-I/Part file-1/126(a)

Copy to:

- 1) The OSD to the Chairman, APGCL - for kind information of Hon'ble Chairman, APGCL
- 2) The OSD to the MD, APGCL- for kind information of MD, APGCL
- 3) Members concerned.
- 4) Relevant file.

  
Chief General Manager (PP&I)  
APGCL



খনিজ সম্পদ  
অন্বেষণ

GOVERNMENT OF ASSAM  
DIRECTORATE OF GEOLOGY AND MINING  
BHU-BIGYAN BHAWAN  
DAKHINGAON,KAHILIPARA,GUWAHATI-19  
Email: [dgmassam@gmail.com](mailto:dgmassam@gmail.com)  
[dgm.assam@gov.in](mailto:dgm.assam@gov.in)

No. GM/MM/86-B (40)/Pt. VII/ Dtd. Guwahati, the May, 2022.

From : - Sri Ananda Kumar Das, ACS,  
Director,  
Directorate of Geology & Mining, Assam,  
Kahilipara, Guwahati-19.

To : - The Divisional Forest Officer,  
Dima Hasao West Division, Haflong.

Sub : - Approval of Mining Plan alongwith progressive Mine Closure Plan in respect of  
**Lower Kopili HEP Stone Quarry (4.61 hec.) in Dima Hasao, Dist. of Assam State**  
submitted under Rule 51 & 52 of Assam Minor Mineral Concession Rules, 2013.

GPS Location:

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| 1) N - 2842295.5840 -E - 480965.5910 | 10) N- 2842274.1650 E - 481187.7550  |
| 2) N - 2842267.7180 -E - 480917.2680 | 11) N- 2842295.0830 E - 481200.4650  |
| 3) N - 2842227.8330 -E - 480952.3940 | 12) N- 2842319.6650 E - 481209.5660  |
| 4) N - 2842144.4680 -E - 480952.3940 | 13) N - 2842348.6830E - 481223.2550  |
|                                      | 14) N- 2842371.5250 E - 2842371.5250 |
| 5) N- 2842166.3650- E - 480978.3580  | 15) N- 2842413.1400 E - 481266.6900  |
| 6) N- 2842264.4310 E- 481101.9610    | 16) N- 2842440.9850 E- 481240.8950   |
| 7) N - 2842243.5210 E - 481132.6190  | 17) N- 2842448.0520 E- 481234.6870   |
|                                      | 18) N- 2842448.0480 E- 481203.9310   |
|                                      | 19) N- 284242.9370 E- 481149.7050    |
|                                      | 20) N- 284241.6650 E - 481125.8150   |
| 8) N - 2842251.6950 E - 481166.7360  |                                      |
| 9) N - 2842257.0930 E - 481174.0820  |                                      |

Ref :- No. FRS/G/101 (a)/MP/EC/2019-20/156-52 dtd. 22/04/2022.

Sir,

In exercise of the power conferred under Rule 51 & 52 of Assam Minor Mineral Concession Rules,2013, I hereby approved the aforesaid Mining Plan (including Progressive Mine Closure Plan) prepared by R.Q.P. Abhijit Bora. This approval is subjected to the following conditions:

- 1) The Mining Plan alongwith Progressive Mine Closure Plan is approved without prejudice to any other law applicable to the mine area from time to time whether made by the Central Government, State Government or any other authority and without prejudice to any order or direction from any court of competent jurisdiction.
- 2) The proposals shown on the plates and/or given in the document is based on the lease map/sketch submitted by the lessee and is applicable from the date of approval.
- 3) It is clarified that the approval of aforesaid Mining Plan along with Progressive Mine Closure Plan does not in any way imply the approval of the Government in terms of any other provision of Mines & Minerals (Development & Regulation) Act,1957 or the Minerals (Other than Atomic & Hydro Carbon Energy Minerals) Concession Rules,2016 and any other laws including Forest (Conservation) Act,1980, Environment (Protection) Act,1986 or the rules made there under Mines Act,1952 and Rule & Regulation made there under.
- 4) Directorate of Geology & Mining, Assam has not undertaken verification of the mining lease boundary on the ground and does not undertake any responsibility regarding correctness of the boundaries of the precise area as furnished by the lessee.

- 5) At any stage, if it is observed that the information furnished data incorporated in the documents are incorrect or misrepresent facts, the approval of the document shall be revoked with immediate effect.
- 6) This approval is restricted in respect of the proposals contained therein within mining lease area and is applicable from the date of approval and maximum quantity of Stone recommended for extraction is 336000 cubic meter for two years to be used for any construction material as well as road metals. subject to all statutory compliance and clearances for the mining activities to be carried out within the mining leasehold.
- 7) Adequate number of check dams and retaining walls shall to made & maintained in good conditions to prevent any anticipated detrimental impact on water regime.
- 8) "Safety Berm" of adequate dimension shall be kept at all the places in the vicinity of statutory barrier, high bench/escarpment. It shall also be ensured that no excavation is to be made in the vicinity of any high side wall/ escarpment. Stability of benches, escarpments shall be closely monitored. It is the responsibility of the lessee to ensure the stability of all the escarpments/side/benches, Lessee shall take all necessary steps time to time so as to ensure the stability of ground, which includes but not limited to reduction of the high side wall to safe and stable condition within first year itself.
- 9) Sufficient safety Berm shall be maintained with respect to public road/village road.
- 10) In case of patta land, a certificate from Revenue Authority should be obtained that the mining area is a nonagricultural land.
- 11) Violation of the provision of the Mining Plan including Progressive Mine Closure Plan shall liable to cancel the Mining Plan.
- 12) Environmental clearance must be obtained from the competent authority before execution.
- 13) Divisional Forest Officer should confirm that the lease area does not fall in the National Park, Wild Life Sanctuary, Game Sanctuary, Bird Sanctuary etc including eco sensitive zone and does not affect the animals, birds and biodiversity in anyway.
- 14) There is no provision of mechanized or semi mechanized mode of extraction in case of river sand mining.
- 15) If necessary, the permit/contract/lease holder may approach the competent authority for blasting permission.
- 16) The Divisional Forest Officer should ensure that no additional quantity is to be extracted.

Encl: Approved Mining Plan alongwith Progressive Mine Closure Plan.

Yours faithfully,

f  
Director,  
Directorate of Geology & Mining, Assam.

- No. GM/MM/86-B (40)/Pt. VI/669-73 Dtd. Guwahati, the 11/5 May, 2022
- Copy to :- 1) The Deputy Commissioner, Dima Hasao. -for kind information and necessary action.  
2) The Superintendent of Police, Dima Hasao -for kind information and necessary action.  
3) HI- Tech Rock Products & Aggregates Limited (Subsidiary Company of Larsen & Toubro Limited), Longku Gaon, P.O. Umrangso, Dist. Dima Hasao, Assam.  
4) Office copy.

  
Director,  
Directorate of Geology & Mining, Assam

NORTH CACHAR HILLS AUTONOMOUS COUNCIL HAILONG  
DIMA HASAO DISTRICT  
DIMA HASAO FOREST DIVISION (WEST)

E.mail westforestdept@gmail.com

No. FRS/10(a)/Stone-Chips/L&T/2022-23/ \_\_\_\_\_ /Dated, Haflong the \_\_\_\_\_

To,

The Range Forest Officer,  
Panimur Range, Panimur.

Sub:- Permission for Extraction/Collection of Boulder for 3,36,000m<sup>3</sup> from mining permit area of Lower Kopili HEP Stone Quarry 4.61 Hectares under Panimur Range.

Ref:- P.S (N) Letter No. FRS/Secit/SP/155/2013-20/L/2/1008-11 Dtd. 08/07/2022

You are hereby asked to realize royalty alongwith GST from Hi-Tech Rock Products & Aggregates Limited (subsidiary company of Larsen & Toubro Limited) for 3,36,000m<sup>3</sup> boulder from Kopili HEP Stone Quarry area under Panimur Range with validity upto 2 years from the date of Issue as per Council Order No. under reference.

  
Divisional Forest Officer,  
Dima Hasao Forest Division (West).  
Haflong.

No. FRS/10(a)/Stone-Chips/L&T/2022-23/ 249-50 /Dated, Haflong the 11/07/22

Copy to:-

1. The Principal Secretary (N), N.C Hills Autonomous Council, Haflong for favour of his kind information with reference to his No. mention above.
2. P.A to Hon'ble CEM N.C Hills Autonomous Council, Haflong for appraisal to the Hon'ble CEM for favour of hid kind information.
3. The Hi-Tech Rock Products & Aggregates Limited, Longku Gaon, P.O.- Umrangso P.S- Umrangso, Dima Hasao District, Assam for information and necessary action.

  
Divisional Forest Officer,  
Dima Hasao Forest Division (West).  
Haflong.

**File No.8-53/2018FC**

Government of India  
Ministry of Environment, Forest and Climate Change  
(F.C. Division)

Indira Paryavaran Bhawan,  
JorBagh Road, Aliganj,  
New Delhi: 110003,

**Dated: 04 December, 2020**

To,

The Addl. Secretary (Forests),  
Government of Assam,  
Environment and Forest Department,  
Dispur, Guwahati-6.

**Sub: Diversion of 523.046 ha of forest land for construction of Lower Kopili Hydro Electric Project by Assam Power Generation Corporation under Dima Hasao West Division, Halflong and Hamren Division, Assam.**

Sir,

I am directed to refer to the Govt. of Assam's letter No. FRS/2018/222 dated 30.07.2018 on the subject mentioned above seeking prior approval of the Central Government under Section-2 of the Forest (Conservation) Act, 1980 and to say that the proposal has been examined by the Forest Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act. After careful consideration of the proposal by the Forest Advisory Committee (FAC) and after its recommendation, and approval of competent authority in the Ministry, *In-principle/Stage-I* approval was accorded vide this Ministry's letter of even number dated 05.02.2019 subject to fulfillment of certain conditions. The State Government has furnished compliance report in respect of the conditions stipulated in the approval and has requested the Central Government to grant final approval.

2. In this connection, I am directed to say that on the basis of the compliance report furnished by the Government of Assam's letter No. FRS.152/2018/346 dated 11.09.2020 and No. FRS.152/2018/414 dated 16.10.2020, and clarification on FRA by Ministry of Tribal Affairs letter No.23011/20/2020-FRA dated 30.10.2020, *approval* of the Central Government is hereby accorded under Section-2 of the Forest (Conservation) Act, 1980 for diversion of 523.046 ha of forest land for construction of Lower Kopili Hydro Electric Project by Assam Power Generation Corporation under Dima Hasao West Division, Halflong and Hamren Division, Assam subject to the following conditions:

**A: Conditions which need to be complied prior to handing over of forest land :**

- i. The Government of Assam, Environment and Forest Department shall issue final notification for the proposed Compensatory Afforestation (CA) area as Reserved Forest/Protected Forest prior to handing over the land to the user agency. The State Government shall ensure that the CA area in the final notification shall not be changed without prior approval of the Government of India and shall not be less than 525.27 ha as proposed in the notification nos. FRS152/2018/354, FRS152/2018/353, FRS152/2018/352, FRS152/2018/351, FRS152/2018/350, FRS152/2018/349, FRS152/2018/348 and FRS152/2018/347 dated 11.9.2020 of the Government of Assam.
- ii. The State Government shall ensure that the User Agency will implement the R&R Plan as per the R&R Policy of the State Government in consonance with the National R&R Policy, Government of India before the commencement of the project work. The said R&R Plan will be monitored by the State Government/concern Regional Office of MoEF&CC along with

File No.8-53/2018FC

- indicators for monitoring and expected observable milestones;
- iii. The State Govt. shall ensure the complete compliance on FRA, 2006.
  - iv. The State Govt. ensure that the User Agency shall obtain the Environment Clearance as per the provisions of the Environmental (Protection) Act, 1986, if required;

**B: Conditions which need to be complied after handing over of forest land to the user agency :**

- i. Legal status of the diverted forest land shall remain unchanged;
- ii. The State Govt. shall ensure that the State Forest Department will raise the Compensatory Afforestation in identified non -forest land in lieu of 523.046 Ha. of forest land, within three years from the issue of approval and maintained thereafter, from the funds deposited by the User Agency. At least 1000 plants per hectare shall be planted as per approved plan/scheme and maintained thereafter subsequently for ten years. The approved Soil and Moisture Conservation (SMC) activities on the CA land shall be carried out by the State Forest Department;
- iii. The State Govt. shall ensure that 198.746 ha out of proposed diversion of 523.046 ha of forest land shall be maintained as Green Belt at the cost of user agency under the supervision of State Forest Department;
- iv. The User Agency shall pay the additional amount of NPV, if so determined, as per the final decision of the Hon'ble Supreme Court of India;
- v. The State Govt. shall ensure that the approved Catchment Area Treatment (CAT) Plan shall be implemented by the State Forest Department from the funds deposited in the account of CAMPA;
- vi. The State Govt. and the User Agency shall ensure that no residential or labour colony/camp shall be constructed over forest land. The User Agency shall provide fuels preferably alternate fuels to the labourers and the staff working at the site so as to avoid any damage and pressure on the nearby forest areas;
- vii. The State Govt. ensure that the User Agency shall carry out muck disposal at pre-designated sites in such a manner so as to avoid its rolling down and the dumping area for muck disposal shall be stabilized and reclaimed by planting suitable species by the user agency at the cost of project under the supervision of State Forest Department. Retaining walls and terracing shall be carried out to hold the dumping material in place. Stabilization and reclamation of such dumping sites shall be completed before handing over the same to the State Forest Department in a time bound manner as per Plan.
- viii. The State Government and the User Agency shall ensure that the tress available between full reservoir level (FRL) and FRL-4 meters are not felled and the User Agency shall carry out afforestation along the periphery of the reservoir;
- ix. The State Govt. and the User Agency shall ensure that period of diversion of the said forest land under this approval shall be for a period co-terminus with the period of the mining lease granted under the Mines and Minerals (Development and Regulation) Act, 1957, as amended and the Rules framed there-under;
- x. The State Govt. shall ensure that the forest land proposed to be diverted shall under no circumstances be transferred to any other agency, department or person without prior approval of the Central Government and the layout plan of the proposal shall not be changed without the prior approval of the Central Government;
- xi. The State Govt. shall ensure that no damage to the flora and fauna of the adjoining area shall be caused;
- xii. The State Govt. shall ensure that the User Agency shall explore the possibility of translocation

**File No.8-53/2018FC**

of maximum number of trees identified to be felled and any tree felling shall be done only when it is unavoidable and that too under strict supervision of the State Forest Department;

- xiii. The State Govt. shall ensure that the User Agency shall provide free water for the forestry related projects;
- xiv. It may please note that violation of any of these conditions will amount to violation of Forest (Conservation) Act, 1980 and action would be taken as prescribed in para 1.21 of Chapter 1 of the Handbook of comprehensive guidelines of Forest (Conservation) Act, 1980 as issued by this Ministry's letter No. 5-2/2017-FC dated 28.03.2019;
- xv. The State Govt. shall ensure that the User Agency shall submit the annual self-compliance report in respect of the above stated conditions to the State Government, concerned Regional Office and to this Ministry by the end of March every year regularly; and
- xvi. The State Govt. shall ensure that the User Agency shall comply all the provisions of the all Acts, Rules, Regulations, Guidelines, Hon'ble Court Order (s) and NGT Order (s) pertaining to this project, if any, for the time being in force, as applicable to the project.

Yours faithfully,

Sd/-

**(Sandeep Sharma)**

Assistant Inspector General of Forests (FC)

**Copy to:**

1. PCCF (HoFF), Government of Assam, Guwahati.
2. Nodal Officer (FCA), Office of the PCCF (HoFF) Government of Assam, Guwahati.
3. Dy. Director General (Central), Integrated Regional Office, Shillong.
4. User Agency.
5. Monitoring Cell of FC Division, MoEF&CC, New Delhi.
6. Guard file.

Annexure 4: Letter to PCCF (WL) cum Chief Wildlife Warden for approval of Conservation Plan for LKHEP.

 **ASSAM POWER GENERATION CORPORATION LIMITED**  
Registered Office: Bijulee Bhawan, 2<sup>nd</sup> floor, Paltan-bazar, Guwahati-781 001, Assam  
**Mr. Ratnajit Biswanath**  
Chief General Manager (Hydro & Civil)  
Phone-0361-2739122  
E-mail: cgmh2019@yahoo.in

Dated: 25/06/2019

No: APGCL/CGM (H)/W/2015/569/Vol-II/04

To,  
The PCCF (WL) cum Chief Wildlife Warden,  
Govt. of Assam,  
Aranya Bhawan,  
Panjabari, Guwahati-37

Sub: Approval for Conservation Plan for Lower Kopilli Hydro Electric Project, 120MW.

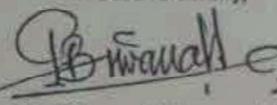
Madam,

It is for your kind information that, Assam Power Generation Corporation Limited is proposed to install 120 MW hydro electric Project at Kopilli river Basin at Longku of Dima Hasao District and Karbi Anglong District.

In this context APGCL has received Stage-I forest clearance from MoEF & CC for diversion of 523.046 Ha of forest land. As advised by Forest Advisory Committee (FAC), MoEF, APGCL has kept 198.746 Ha forest as green belt. For necessary fees for NPV, CA, S&M conservation plan, CAT Plans, ETC has been approved by the respective divisions of forest department for payment in CAMPA account. Accordingly APGCL has initiated necessary actions for release of the aforesaid payment at an early date ahead.

The conservation plan for biodiversity (Flora and Fauna) is enclosed herewith for your kind approval and necessary action.

Thanking You,

Yours faithfully,  
  
Chief General Manager (H&C)  
APGCL

Copy to-

- 1) The Managing Director, APGCL, Bijulee Bhawan, Paltanbazar, Guwahati-1, for kind information.
- 2) The Project Director, Lower Kopilli H.E. Project, APGCL, Bijulee Bhawan, Paltanbazar, Guwahati -1 for information.
- 3) Relevant File.

*Received on 25.6.19*



Annexure 5. Constitution of Biodiversity Management Committee



**ASSAM POWER GENERATION CORPORATION LIMITED**

Registered Office: Bijulee Bhawan, 3<sup>rd</sup> floor, Paltanbazar, Guwahati-781 001, Assam

**Mridul saikia**  
**Chief General Manager (PP&I)**  
**Project Director (PMU)**  
Email:mridul.saikia@apgcl.org

No: APGCL/LKHEP/PD/2022-23/81/02

Dated: 12.10.2022

**OFFICE ORDER**

A Biodiversity Management Committee is hereby constituted for Lower Kopili Hydro Electric Project for effective implementation, monitoring and evaluation of the Biodiversity Conservation and Wildlife Management Plan with the following members:

1. Project Director (PMU), APGCL- **Chairman**
2. GM, LKHEP, APGCL- **Convenor**
3. DGM (Civil), LKHEP, Longku, APGCL- **Member**
4. DGM (PP&I), APGCL HQ – **Member**
5. AGM, F&A, APGCL HQ- **Member**
6. Environment Expert, APGCL- **Member**
7. Representative from Department of Environment & Forest, GoA- **Member**
8. Chief Conservator of Forest, Dima Hasao- **Member**
9. DFO, West Karbi Anglong- **Member**
10. Representative from Assam Biodiversity Board- **Member**

The committee will look after the demarcated conservation areas, monitor and enforce regulatory provisions and ensure that the structure and functions of the natural ecosystems in the area are not changed or subjected to any threat. The Committee would also propose other approaches for the biodiversity conservation plan, whenever deemed necessary including the proposed measures for conservation of the endangered and critically endangered species of the area.

  
Project Director (PMU)  
APGCL  
Dated: 12.10.2022

Memo No: APGCL/LKHEP/PD/2022-23/81/02(a)

Copy to:

- 1) The OSD to the Chairman, APGCL - for kind information of Hon'ble Chairman, APGCL
- 2) The OSD to the MD, APGCL- for kind information of MD, APGCL
- 3) Officers concerned.
- 4) Relevant file.

  
Project Director (PMU)  
APGCL



**Pollution Control Board:: Assam**  
**Bamunimaidam; Guwahati-21**  
(Department of Environment & Forests :: Government of Assam)  
Phone: 0361-2652774 & 2550258; Fax: 0361-2550259  
Website: [www.pcbassam.org](http://www.pcbassam.org)



No. WB/SLC/T-1191/21-22/17

Dated Guwahati, the 27<sup>th</sup> December, 2021

**“CONSENT TO OPERATE”**

“CONSENT TO OPERATE” (CTO) under Section 25 of Water (Prevention and Control of Pollution) Act 1974 and Section 21 of Air (Prevention and Control of Pollution) Act, 1981 as amended is granted to-

- i) Name of Industry : **M/s Larsen & Toubro Limited.**
- ii) Name of the Occupier / Applicant and Designation : **Sri Santanu Majumdar, Project Manager**
- iii) Address of Industry : **Vill-Totelangso, P.O-Umrangso, Dist-Dima Hasao, Assam**
- iv) Project cost : **Rs. 95.00 Lakhs**
- v) Details of Products :

Sl No.	Product	Quantity/ Capacity
1	Ready Mix Concrete	5200 M <sup>3</sup> /Month

- vi) DG Sets : **1x250 KVA, 1x180 KVA, 1x140 KVA & 1x125 KVA**

**TERMS AND CONDITIONS:**

1. This CTO has been accorded based on the particulars furnished by the applicant vide Application ID **838921** and subject to addition of further more conditions if so warranted by subsequent developments. The CTO will automatically become invalid if there is any changes, modification, alteration, expansion or deviation is made in actual practice.
2. The CTO is valid for a period up to 31.03.2025 unless otherwise suspended or revoked.
3. The CTO may be modified, suspended or revoked by the Board in whole or in part during its term for cause including, but not limited to the following:-
  - a) Violation of any Terms and Conditions of this CTO;
  - b) Obtaining the CTO by misrepresentation or failure to disclose fully all relevant facts;
  - c) A change in any condition that require temporary or permanent reduction or elimination of the authorized discharge/emission;
4. **The project proponent shall develop a greenbelt / Plantation area with native trees covering at-least 33% of total plot area for the development of greenbelt and carbon sink.**
5. As per provisions of water (Prevention & Control of Pollution) Act, 1974 and Air (Prevention & Control of Pollution) Act, 1981 any officer, employed by this Board in its behalf shall have without any interruption, the right at any time to enter the industry for inspection, to take samples for analysis and may call for any information etc.
6. **The project authority should install a Display Board as per the Boards notification no.CBA/LGL-95/2021/Notification/01 dtd.11.11.2021. (Copy enclosed as Appendix-A).**
7. Permission shall be obtained from the Central Ground Water Authority (CGWA) for the extraction of ground water, if applicable.

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-2-

- Measures including water sprinkling shall be provided at all the material in the haul roads to control fugitive emission.

**Air Aspects:**

- The unit shall comply with the **Particulate Matter (PM) emission level at 150 mg/Nm<sup>3</sup>**
- Dust suppression measures are to be taken by the industry to control the dust in the haul roads during movement of vehicles.
- The unit shall comply with the **standards and guidelines for control of noise pollution from stationary Diesel Generator (DG) set as notified vide GSR 7, dtd.22.12.1998** as attached in **Appendix-B**.
- Necessary steps are to be made to bring the noise within the prescribe limit as stipulated below:

Limit in dB(A) Leq.	
Day time	Night time
75	70

- The industry must comply the National Ambient Air Quality Standards as per Schedule – VII under Rule, 3 (3B) of the Environment (Protection) Rules, 1986 as prescribed **vide CPCB Notification No. B-29016/20/90/PCI-I dtd. 18.11.2009** (copy enclosed as **Appendix -C**) especially for PM<sub>2.5</sub> & PM<sub>10</sub>.

Sr. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air	
			Industrial, Residential, Rural & Other Area	Ecologically Sensitive Area (notified by Central Government)
1.	Particulate Matter (size less than 10µg) or PM10 µg/m3	Annual* 24 hours**	60 100	60 100
2.	Particulate Matter (size less than 2.5µg) or PM2.5 µg/m3	Annual* 24 hours**	40 60	40 60

**Water Aspects:**

- The unit must construct **effluent treatment system for the treatment of waste water and the parameters should meet with general discharge parameters standard as per G.S.R. 422(E) dated 19.05.1993** (Copy enclosed as Appendix -D).
- The unit shall reuse the treated water at their own processes.

**Solid Waste Aspect-**

- Adequate facility should be created for collection, storage, transportation, treatment & disposal of solid waste generated from the Industry
- Adequate system should be adopted on reduction of waste generation and enhancement of re-utilization & recycling of waste materials.
- Solid waste generated in the unit shall be disposed of as per the provisions of the Solid Waste Management Rules 2016.

Contd....P/3

7/13/20 43



**D. Hazardous Waste Aspects-**

1. The unit shall apply for authorization under the Hazardous & Other waste (Management & Transboundary Movement) Rules, 2016 and submit the annual return under Hazardous & Other Waste (Management & Trans Boundary Movement) Rules 2016 in the Form-IV within 30th June every year.
2. Adequate facility shall be provided for collection and storage of spent oil and such hazardous waste generated in the unit shall be sent to registered recyclers for recycling.
3. The unit shall disposed hazardous waste generated in the unit in accordance to the provisions of the Hazardous & Other Waste (Management & Trans Boundary Movement) Rules 2016 including Notification, Guidelines issued there under.

The unit shall submit compliance report of the mandated conditions by April 15 of every year to Member Secretary, PCBA as well as to Regional Office, Silchar, PCBA. The Board will have the liberty to withdraw the CTO if adequate pollution control and safety measures are not taken.

//  
(Shantanu Kr. Dutta)  
Member Secretary

Memo No. WB/ SLC/T-1191/21-22/17-A, <sup>1947</sup>

Dated Guwahati, the 27<sup>th</sup> December, 2021

Copy to:

- 1 ✓ M/s Larsen & Toubro Limited, Vill- Totelangso, P.O-Umrangso, Dist- Dima Hasao, Assam A for information & necessary action.
2. The Executive Engineer; RLO, Silchar, Pollution Control Board, Assam for information & necessary action.

शिवरुद्र  
(Shantanu Kr. Dutta)  
Member Secretary



**Pollution Control Board:: Assam**  
**Bamunimaidam; Guwahati-21**  
 (Department of Environment & Forests :: Government of Assam)  
 Phone: 0361-2652774 & 2550258; Fax: 0361-2550259  
 Website: [www.pcbassam.org](http://www.pcbassam.org)



No. WB/SLC/T-1184/21-22/09

Dated Guwahati, the 07/12/2021

**“CONSENT TO OPERATE”**

“CONSENT TO OPERATE” (CTO) under Section 21 of Air (Prevention and Control of Pollution) Act, 1981 as amended is granted to:-

- i) Name of Industry :M/s Larsen & Toubro Ltd  
 ii) Name of the Occupier :Shri SANTANU MAJUMDAR, PROJECT  
 Applicant and Designation MANAGER  
 iii) Address of Industry :Vill-Totelangso, P.O.: Umrangso,Dist: Dima  
 Hasao, PIN: 788931, Assam  
 iv) Project cost 47.0 (In Lakhs)  
 v) Validity 31-03-2025

SI No.	Number / Type of Crusher	Capacity
1	Jaw Crusher-Primary	200 TPH
2	Jaw Crusher-Secondary	200 TPH

SI No.	Product	Quantity/ Capacity
1	Stone Aggregate	33378 MT/Month
2	<u>By product:</u> 1.Quarry Wastage 2. Micro Fines	5006 MT/Month 3337 MT/Month.

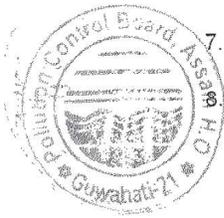
- vi) DG Set 4 nos. of capacity – 40 KVA, 125 KVA, 180 KVA & 250 KVA

**TERMS AND CONDITIONS:**

- This CTO has been accorded based on the particulars furnished by the applicant vide Application ID **810264** and subject to addition of further more conditions if so warranted by subsequent developments. The CTO will automatically become invalid if there is any changes, modification, alteration, expansion or deviation is made in actual practice.
- The CTO is valid for a period up to **31.03.2025** unless otherwise suspended or revoked.
- The CTO may be modified, suspended or revoked by the Board in whole or in part during its term for cause including, but not limited to the following:-
  - Violation of any Terms and Conditions of this CTO;
  - Obtaining the CTO by misrepresentation or failure to disclose fully all relevant facts;
  - A change in any condition that require temporary or permanent reduction or elimination of the authorized discharge/emission;
- The CTO does not authorize any addition, alteration, modification, modernization of processor products without prior permission of the Board.
- Proper housekeeping shall be maintained within unit premises.
- The project proponent must develop a greenbelt/plantation area with native trees covering atleast 33% of the total plot area to develop Green Belt and Carbon Sink.

Contd...p/2

*S.M.L.*



7. The project authority should install a Display Board as per the Boards notification no. PCBA/LGL-95/2021/Notification/01 dtd.11.11.2021. (Copy enclosed as **Appendix-A**).

8. As per the provisions of the Water (Prevention and Control of Pollution) Act, 1974 as amended and Air Prevention and Control of Pollution) Act, 1981 as amended that any Officer empowered by the Board on its behalf shall have without interruption, the right at any time to enter the unit premises for inspection, collection of sample for analysis and may call for any information as deemed necessary. Denial of this right will cause withdrawal of the Consent Order.

9. The unit shall apply for renewal atleast ninety (90) before expiry of this CTO.

**Specific Conditions:**

**10. DG Set**

The unit shall comply with the **standards and guidelines for control of noise pollution from stationary Diesel Generator (DG) set** as attached in Appendix-B.

11. The industry shall take adequate measures for control of noise from its own source so as to comply with the Standards below:

Category of Area	Limit in dB(A) Leq.	
	Day Time (6:00am-9:00pm)	Night Time (9:00pm-6:00am)
Industrial area	75	70

12. The industry must comply with the National Ambient Air Quality Standards as prescribed vide Notification No. B-29016/20/90/PCI-I dtd. 18.11.2009 especially with reference to PM<sub>2.5</sub> & PM<sub>10</sub> as follows:

Sl. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air	
			Industrial, Residential, Rural & Other Area	Ecologically Sensitive Area (notified by Central Government)
1.	Particulate Matter (size less than 10µg) or PM <sub>10</sub> µg/m <sup>3</sup>	Annual*	60	60
		24 hours**	100	100
2.	Particulate Matter (size less than 2.5µg) or PM <sub>2.5</sub> µg/m <sup>3</sup>	Annual*	40	40
		24 hours**	60	60

13. The unit shall comply with the **air quality standard of Stone crusher** as follows:

Sl. No.	Pollutant	Standards
1.	Suspended particulate matter	The suspended particulate matter measured between 3 meters and 10 meters from any process equipment of a stone crushing unit shall not exceed 600 micrograms per cubic meter.

**Hazardous Waste Aspect:**

1. The unit shall apply for authorization under the Hazardous & Other Wastes (Management & Transboundary Movement) Rules, 2016.
2. Appropriate facility should be created for handling, storage, treatment & disposal of Hazardous waste generated from the industry such as spent oil, waste oil etc. in accordance to the provisions of the Hazardous & Other Wastes (Management & Trans Boundary Movement) Rules, 2016 including Notification, Guidelines issued there under;
3. The unit should submit the annual return under the Hazardous & Other Wastes (Management & Trans Boundary Movement) Rules, 2016 in the Form-IV within 30<sup>th</sup> June every year, E-Waste Management Rules, 2016 in the Form-III within 30<sup>th</sup> June every year and Plastic Waste Management Rules, 2016 within 30<sup>th</sup> June every year.

Contd...p/3

*S. D. S.*

The unit shall submit compliance report of the mandated conditions by April 15 of every year to Member Secretary, PCBA as well as to concerned Regional Office of the Board. The Board will have the liberty to withdraw the CTO if adequate pollution control and safety measures are not taken.

//  
(Shantanu Kr. Dutta)  
Member Secretary

Memo No. WB/SLC/T-1184/21-22/09-A, <sup>1/15</sup>  
Copy to:

Dated Guwahati, the 07/12/ 2021

- ✓ 1. M/s Larsen & Toubro Ltd, Vill-Totelangso, P.O.: Umrangso, Dist: Dima Hasao, PIN: 788931, Assam for information & necessary action.
2. The General Manager, DI & CC, Dima Hasao District, Assam, for information.
3. The Executive Engineer; Regional Lab cum Office, Silchar; Pollution Control Board, Assam for information & necessary action.

<sup>21/12/21</sup>  
(Shantanu Kr. Dutta)  
Member Secretary



**Pollution Control Board:: Assam**  
**Bamunimaidam; Guwahati-21**  
(Department of Environment & Forests :: Government of Assam)  
Phone: 0361-2652774 & 2550258; Fax: 0361-2550259  
Website: [www.pcbassam.org](http://www.pcbassam.org)



No. WB/SLC/T-1191/21-22/31

Dated Guwahati, the 31<sup>st</sup> Oct, 2022

**“CONSENT TO OPERATE”**

‘CONSENT TO OPERATE’ (CTO) under Section 21 of the Air (Prevention & Control of Pollution) Act, 1981, as amended and Rules Framed thereunder, is granted to:

- i) Name of the unit : M/s Larsen & Toubro Ltd. (Batching Plant)  
ii) Name of the Occupier / Applicant and Designation : Sri Santanu Majumder, Project Manager  
iii) Address of the unit : Lower Kopili Hydro Electric Power Project,  
Vill - Longku, P.O. Umrangso, Dist. Dima Hasao,  
Assam-788931.  
iv) Cost of the project : Rs. 744.69 Lakhs.  
v) Details of the project & category : Batching Plant  
(Green Category)

Sl. No.	Product	Capacity
1.	Cement Concrete	20,000 m <sup>3</sup> / month

- vi) D.G. Set : 2 x 15 KVA + 2 x 500 KVA

**General Conditions:**

1. The Consent to Operate (CTO) has been accorded based on the particulars furnished by the applicant vide **Application ID: 1410031** and subject to addition of further or more conditions, if so warranted by subsequent developments. The Consent will automatically become invalid, if any change or alteration or deviation made in actual practice.
2. The CTO is valid till **31.03.2025**.
3. The CTO may be modified, suspended in whole or in part or withdrawn by the Board during its term for cause including, but not limited to the following:-
  - a) Violation of any Terms and Conditions of this CTO;
  - b) Obtaining the CTO by misrepresentation or failure to disclose fully all relevant facts;
  - c) If any genuine complaint received;
4. The unit shall obtain prior ‘Consent to Establish’ from the Board for any further expansion, alteration, and modification of the project.
5. **The project proponent shall develop a greenbelt/plantation area with native trees covering atleast 33% of the total plot area.**
6. **The project authority should install a Display Board as per the Boards notification No. PCBA/LGL-95/2021/Notification/01 dtd.11.11.2021 (Annexure-A).**
7. **Proper housekeeping shall be maintained. Burning of any waste inside the unit premises is strictly prohibited.**
8. The unit shall apply for renewal of CTO atleast 90 days before expiry. The Board has decided to renew the CTO for validity of 5 (five) years after payment of due fees, for the entire period.
9. As per the provisions of the Water (Prevention and Control of Pollution) Act, 1974 as amended and the Air (Prevention and Control of Pollution) Act, 1981, as amended, any Officer, empowered by the Board on its behalf shall have without interruption, the right at any reasonable time to enter the unit for inspection, collection of sample for analysis and may call for any information as deemed necessary. Denial of this right will cause withdrawal of the Consent Order.

Contd...p/2



**Specific Conditions:**

**A) Air Aspects:**

1. \*The unit shall install the screening machine, with proper enclosure and dust extraction and treatment mechanism.
2. The following air pollution control measures shall be implemented by the project authority to control source emission and fugitive emission:
  - a) Dust containment cum suppression system at Raw Material Feed Hopper, all material transfer & dropping points.
  - b) Construction of the metallic roads within the premises.
  - c) Regular cleaning and wetting of ground within the premises.
3. The unit shall comply with the standards and guidelines for control of noise pollution from stationary Diesel Generator (DG) set as attached in Appendix-B.
4. The unit shall comply with the Noise Level Standard notified by MoEF&CC, Govt. of India, vide GSR.7; dtd: 22/12/1998, as mentioned herein under:

Limit in dB (A) Leq	
Day Time (6:00AM-10:00PM)	Night Time (10:00PM-6:00AM)
75	70

5. The Ambient Air Quality within the Plant premises shall be maintained within the National Ambient Air Quality Standards as notified by MoEF&CC, Govt. of India, vide G.S.R.826(E) dtd.18.11.2009, especially w.r.t. PM<sub>2.5</sub> & PM<sub>10</sub>, as mentioned herein under:

Sl. No.	Pollutant	Time Weighted Average	Concentration in Ambient Air	
			Industrial, Residential, Rural & Other Area	Ecologically Sensitive Area (notified by Central Government)
1.	Particulate Matter (size less than 10µg) or PM <sub>10</sub> (µg/m <sup>3</sup> )	Annual*	60	60
		24 hours**	100	100
2.	Particulate Matter (size less than 2.5µg) or PM <sub>2.5</sub> (µg/m <sup>3</sup> )	Annual*	40	40
		24 hours**	60	60

**B) Water Aspects:**

1. Source of Water : Surface water
2. Water consumption : 200.0 KLD
3. Storm Water Aspect:
  - a) Storm water shall not be allowed to mix with effluent and/or floor washings.
  - b) Storm water within the battery limits of the unit shall be channelized through separate drain/pipe passing through an Oil & Grease Trap cum Sedimentation Tank.
  - c) Storm water discharge shall meet with general effluent discharge parameters standard, notified by MoEF & CC, GOI vide G.S.R.422 (E); dated 31.12.1993 (Appendix - C).
4. Rain water harvesting facility shall be installed and maintained.

**C) Solid Waste Aspects:**

1. Adequate facility should be created for collection, storage, transportation, treatment & disposal of non-hazardous industrial solid waste generated from the Industry.
2. Adequate system should be adopted on reduction of waste generation and enhancement of re-utilization & recycling of waste materials.
3. The unit shall strictly comply with all the provisions of the Solid Waste Management Rules, 2016.

*Handwritten signature/initials*

Contd...p/3

**D) Plastic Waste Aspects:**

1. Plastic waste generated in the unit shall be disposed of scientifically as per the provisions of the **Plastic Waste Management Rules, 2016**.
2. The unit shall submit a report on generation and disposal of Plastic Wastes within June every year.

**E) E-Waste Aspects:**

1. Electronic wastes generated in the unit shall be disposed of as per the provisions of **E-Waste Management Rules, 2016**.
2. The unit shall submit the Annual Report in the Form-III within 30<sup>th</sup> June every year.

**F) Hazardous Waste Aspects:**

1. **Authorization under Hazardous & Other Wastes (Management & Trans-boundary Movement) Rules, 2016 shall be obtained from the Board.**
2. The project authorities shall comply with the provisions of the said Rules.
3. Adequate facility shall be provided for collection and storage of used/spent oil, which shall be sent to registered recyclers for recycling.
4. The unit shall dispose of any other Hazardous Waste generated by the unit as per the provisions of the Rules.
5. The unit shall identify and quantify all streams of Hazardous Waste generation as per Schedule-I and maintain proper record in Form-III of the said Rules.
6. The unit shall submit annual return in Form-IV under the said rules on or before 30<sup>th</sup> June every year.

The unit shall submit compliance report of the mandated conditions by April, 15, every year to Member Secretary, PCBA as well as to Regional Office, Silchar. The Board will have the liberty to withdraw the CTO, if adequate pollution control and safety measures are not implemented by the unit.

*sd/-*  
(Shantanu Kr. Dutta)  
Member Secretary

Dated Guwahati, the 31<sup>st</sup> Oct, 2022

Memo No. WB/SLC/T-1191/21-22/31 -A. *1985*  
Copy to:

- ✓ 1. M/s Larsen & Toubro Ltd. (Batching Plant), Lower Kopili Hydro Electric Power Project, Vill: Longku, P.O. Umrangso, Dist. Dima Hasao, Assam-788931 – for information & compliance of conditions.

*ms*  
(Shantanu Kr. Dutta)  
Member Secretary  
*ms*

Annexure 9 : Monitoring reports



Recognized by Pollution Control Board, Assam



**AMBIENT AIR ANALYSIS REPORT**

**TESTREPORT**

Rep.No. AAAR\_1503163\_01\_820

Date: 07/10/2022

Sample ID: EETNE/SEPT/17(1)/22

ULR NO.: TC 7669

Issued to : M/s. Lower Kopili HEP Project, Lanku, Dist.- Dima Hasao, Assam.

Sample Drawn By : UTPAL BEZBARUAH  
 Sampling Plan & Procedure : EETNE/SOP/01  
 Analysis Duration : 20/09/22 TO 24/09/22, 21/09/22 TO 25/09/22, 22/09/22 TO 26/09/22, 23/09/22 TO 27/09/22, 24/09/22 TO 28/09/22, 25/09/22 TO 29/09/22, 26/09/22 TO 30/09/22, 27/09/22 TO 01/10/22  
 Sampling Instrument Used : AMBIENT AIR SAMPLER/RDS  
 Pollution Control Device, if any : NO

SL. NO.	DATE OF SAMPLING	LOCATION/ SOURCE (Latitude & Longitude)	WEATHER	PARAMETERS					
				PM <sub>10</sub> (µg/m <sup>3</sup> )	PM <sub>2.5</sub> (µg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> )	HC (mg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )
i)	20/09/22	Power Inlet / Dam Site Lat N 25°39'57.39" Long E 92°46'53.62"	Clear	32.3	18.6	13.8	BDL	BDL	9.2
ii)	21/09/22	Crusher Site Lat N 25°40'37.79" Long E 92°47'43.13"		40.3	26.1	15.6	0.03	0.04	11.8
iii)	22/09/22	HRT Adit Lat N 25°40'47.89" Long E 92°48'9.67"		36.2	19.2	10.8	BDL	BDL	8.3
iv)	23/09/22	Primary Hospital Near APGCL Camp Lat N 25°39'59.93" Long E 92°47'45.52"		30.7	18.6	10.6	BDL	BDL	8.7
v)	24/09/22	Batching plant Lat N 25°41'45.31" Long E 92°48'39.79"		31.6	21.5	14.8	BDL	BDL	10.0
vi)	25/09/22	Surge Shaft Site Lat N 25°41'29.28" Long E 92°48'16.47"		30.7	16.2	12.2	BDL	BDL	9.2
vii)	26/09/22	Labour & Staff Camp Lat N 25°40'54.97" Long E 92°48'9.67"		32.6	15.7	11.3	BDL	BDL	7.8
viii)	27/09/22	Power house Lat N 25°41'54.02" Long E 92°46'53.62"		34.6	18.8	10.2	BDL	BDL	7.4

Remarks: - Sampling were done within the annual based.  
**NATIONAL AMBIENT AIR QUALITY STANDARDS:**

Sl. No.	Pollutant	Test Method	Time Average	Weighted	Concentration in Ambient Air Industrial, Residential, Rural and Other Area
1	Particulate Matter (PM <sub>10</sub> ), µg/m <sup>3</sup>	IS:5182 Part-XXIII/ CPCB	Annual		60
2	Particulate Matter (PM <sub>2.5</sub> ), µg/m <sup>3</sup>	EETNE/SOP/01/2017	Annual	24 hours	40 100
3	Nitrogen Dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>	IS:5182 Part-VI/ CPCB	Annual	24 hours	40 60
4	Carbon Monoxide (CO), mg/m <sup>3</sup>			24 hours	80
5	Sulphur Dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	IS:5182 Part-II/ CPCB	Annual	8 Hours	2.0
				24 hours	80

Utpal Bezbaruah  
 (Environmental Chemist)

Dr. Pranjit Chakraborty  
 Authorized by (Quality Manager)

Note: i) Tests undertaken twice a week in each location.  
 ii) The results relate only to the parameters tested.  
 iii) The test report shall not be reproduced except in full, without written approval of laboratory.



Recognized by Pollution Control Board, Assam

**TEST REPORT**

**AMBIENT NOISE LEVEL MEASUREMENT REPORT**

Rep.No. ANLMR\_1503163\_06A\_821  
Sample ID: EETNE/SEPT/17(1)/22

Date: 07/10/2022  
ULR NO.: TC766922000000802P

Issued to : M/s. Lower Kopili HEP Project, Lanku, Dist.- Dima Hasao, Assam.

SL. NO.	DATE OF SAMPLING	LOCATION /SOURCE (Latitude and Longitude)	NOISE LEVEL in dB(A)Leq	
			Day (6:00 am to 10:00 pm)	Night (10:00 pm to 6:00 am)
i)	21/09/22	Power Inlet / Dam Site Lat N 25°39'57.39" Long E 92°46'53.62"	47.3	38.6
ii)	22/09/22	Crusher Site Lat N 25°40'37.79" Long E 92°47'43.13"	57.2	44.2
iii)	23/09/22	HRT Adit Lat N 25°40'47.89" Long E 92°48'9.67"	52.4	40.3
iv)	24/09/22	Primary Hospital Near APGCL Camp Lat N 25°39'59.93" Long E 92°47'45.52"	55.7	40.8
v)	25/09/22	Batching plant Lat N 25°41'45.31" Long E 92°48'39.79"	50.9	44.5
vi)	26/09/22	Surge Shaft Site Lat N 25°41'29.28" Long E 92°48'16.47"	49.2	37.3
vii)	27/09/22	Labour & Staff Camp Lat N 25°40'54.97" Long E 92°48'9.67"	53.5	44.7
viii)	28/09/22	Power house Lat N 25°41'54.02" Long E 92°46'53.62"	54.3	42.8

Remarks: Noise level is carried out during 75% of the Day Time & Night Time.  
Method of analysis : CPCB July 2015 guideline.  
Sampling Instrument Used : Lutron SL-4033SD, HTC SL 1350

**Ambient Noise Standards:**

Area Code	Category of area	Limits in dB(A) Leq	
		Day (6:00 am to 10:00 pm)	Night (10:00 pm to 6:00 am)
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Utpal Bezbaruah  
(Environmental Chemist)

For Enviro Enviro Technologies North East, Guwahati  
Dr. Pranita Chakraborty  
Authorized by (Quality Manager)

Note: i) The results relate only to the parameters tested.  
ii) The test report shall not be reproduced except in full, without written approval of laboratory.  
iii) Monitoring is performed twice a week in each location.



Recognized by Pollution Control Board, Assam

**TEST REPORT:**  
 Report No: 221010\_1503163\_0  
 ULR No: TC76692200000217P  
 Sample ID No: EETNE/Sept/21/22/D  
 Test Starting Date: 29/09/22

Date of Report: 10/10/22  
 Date of sample receipt: 29/09/22  
 Test completion Date: 10/10/22

Name & Address of Client	M/s. Lower Kopili Project. Near Lanka, Dist: Dima Hasao.				
Sample Description	Type: Surface Water (3 km D/S of dam site)	Source: Kopili River	Location: Latitude: N 25°41'02.68// Longitude: E 92°47'17.59//		
Sample collected by	M/s. En-vision Enviro Technologies North East				
Sample Collection Particulars	Date 27/09/2022	Time 2:40 P.M	Temperature 30°C	Quantity Drawn:4L	Sampling Method: EETNE/SOP/02

Sl No.	Parameters	Unit	Result	Reference Method
1	pH	---	7.20	APHA 23 <sup>rd</sup> Edition, 4500 H <sup>+</sup> , Page: 4-95
2	Turbidity	NTU	2.13	APHA 23 <sup>rd</sup> Edition, 2130, Page: 2-13
3	TDS	mg/L	36	APHA 23 <sup>rd</sup> Edition, 2540 C, Page : 2-69
4	TSS	mg/L	71.3	APHA 23 <sup>rd</sup> Edition, 2540, Page: 2-70
5	Oil and Grease	mg/L	<5	APHA 23 <sup>rd</sup> Edition, 5520 B, Page: 5-42
6	Dissolved Oxygen	mg/L	7.9	APHA 23 <sup>rd</sup> Edition, 4500-O C, Page: 4-146
7	Total hardness	mg/L	62.4	APHA 23 <sup>rd</sup> Edition, 2340 B, Page: 2-48
8	Calcium	mg/L	30.5	APHA 23 <sup>rd</sup> Edition, 3500-Ca B, Page: 3-69
9	Magnesium	mg/L	15.2	APHA 23 <sup>rd</sup> Edition, 3500-Mg B, Page: 3-86
10	Total Alkalinity	mg/L	44.9	APHA 23 <sup>rd</sup> Edition, 2320, Page: 2-37
11	Sulphate	mg/L	11.6	APHA 23 <sup>rd</sup> Edition, 4500-SO <sub>4</sub> <sup>2-</sup> E, Page: 4-199
12	Nitrates	mg/L	10.5	APHA 23 <sup>rd</sup> Edition, 4500-NO <sub>3</sub> <sup>-</sup> B, Page: 4-127
13	Phosphate	mg/L	<0.02	APHA 23 <sup>rd</sup> Edition, 4500-P, Page: 4-163
14	Salinity	%	0.3	APHA 23 <sup>rd</sup> Edition, 2520B, Page: 2-60
15	Conductivity	µS/cm	79	APHA 23 <sup>rd</sup> Edition, 2520B, Page: 2-60





Recognized by Pollution Control Board, Assam

Sample ID No: EETNE/Sept/21/22/D  
 Test Starting Date: 29/09/22

Date of sample receipt: 29/09/22  
 Test completion Date: 10/10/22

Sl No.	Parameters	Unit	Result	Reference Method
16	Chloride	mg/L	16.3	APHA 23 <sup>rd</sup> Edition,4500-Cl <sup>-</sup> B,Page:4-75
17	Arsenic	mg/L	BDL	APHA 23 <sup>rd</sup> Edition,3114A,Page:3-36
18	Iron(as Fe)	mg/L	1.5	APHA 23 <sup>rd</sup> Edition,3500-Fe B,Page:3-80
19	Total Coliform	MPN/100	3	APHA 23 <sup>rd</sup> Edition,9222B,Page:9-81
20	Fecal Coliform	MPN/100	Nil	APHA 23 <sup>rd</sup> Edition,9222 D,Page:9-89
21	BOD	mg/L	7	APHA 23 <sup>rd</sup> Edition,5210B,Page:5-6
22	COD	mg/L	48	APHA 23 <sup>rd</sup> Edition,5220 b,Page:5-18

For Envision Enviro Technologies North East, Guwahati

  
**Rimpi Sarma**  
 Environmental Chemist  
 Test Done By

  
**Dr. Pranita Chakraborty**  
 Quality Manager  
 Authorized Signatory

Note: i) The results relate only to the parameters tested.  
 ii) The test report shall not be reproduced except in full, without written approval of laboratory  
 iii) Parameter no.11 to 20 are analyzed by Department of Chemistry,B.Borooah College as per our MOU.  
**End of report**

Page 2 of 2



**NABL ACCREDITED**  
 Certificate No. TC-7669

**TEST REPORT:**  
 Report No: 221010\_1503163\_0  
 ULR No: TC76692200000221P  
 Sample ID No:EETNE/Sept/25/22/D  
 Test Starting Date: 29/09/22

Date of Report: 10/10/22  
 Date of sample receipt: 29/09/22  
 Test completion Date: 10/10/22

Name & Address of Client	M/s. Lower Kopili Project. Near Lanka, Dist: Dima Hasao.				
Sample Description	Type: Ground Water	Source: Choto Langpher ME School	Location: Latitude: N 25°41'55.88// Longitude:E 92°48'56.07//		
Sample collected by	M/s. En-vision Enviro Technologies North East				
Sample Collection Particulars	Date 28/09/2022	Time 09:30 A.M	Temperature 29°C	Quantity Drawn:4L	Sampling * Method: EETNE/SOP/02

SI No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
1	p <sup>H</sup>	---	7.05	APHA 23 <sup>rd</sup> Edition,4500 H <sup>+</sup> ,Page:4-95	6.5-8.5
2	Turbidity	NTU	1.1	APHA 23 <sup>rd</sup> Edition,2130,Page:2-13	5
3	TDS	mg/L	125.6	APHA 23 <sup>rd</sup> Edition,2540 C ,Page :2-69	2000
4	TSS	mg/L	74.2	APHA 23 <sup>rd</sup> Edition,2540,Page:2-70	----
5	Oil and Grease	mg/L	<5	APHA 23 <sup>rd</sup> Edition,5520 B,Page:5-42	----
6	Dissolved Oxygen	mg/L	7.1	APHA 23 <sup>rd</sup> Edition,4500-O C,Page:4-146	100
7	Total hardness	mg/L	78.2	APHA 23 <sup>rd</sup> Edition,2340 B,Page:2-48	600
8	Calcium	mg/L	38.7	APHA 23 <sup>rd</sup> Edition,3500-Ca B,Page:3-69	200
9	Magnesium	mg/L	19.3	APHA 23 <sup>rd</sup> Edition,3500-Mg B,Page:3-86	100
10	Total Alkalinity	mg/L	223	APHA 23 <sup>rd</sup> Edition,2320,Page:2-37	600
11	Sulphate	mg/L	16.9	APHA 23 <sup>rd</sup> Edition,4500-SO <sub>4</sub> <sup>2-</sup> E,Page:4-199	400
12	Nitrates	mg/L	3.8	APHA 23 <sup>rd</sup> Edition,4500-NO <sub>3</sub> <sup>-</sup> B,Page:4-127	No relaxation
13	Phosphate	mg/L	<0.01	APHA 23 <sup>rd</sup> Edition,4500-P,Page:4-163	No relaxation
14	Conductivity	µS	240	APHA 23 <sup>rd</sup> Edition,2520B,Page:2-60	No relaxation





Sample ID No: EETNE/Sept/25/22/D  
 Test Starting Date: 29/09/22

Date of sample receipt: 29/09/22  
 Test completion Date: 10/10/22  
**NABL ACCREDITED**  
 Certificate No. 107669

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
15	Arsenic	mg/L	BDL	APHA 23 <sup>rd</sup> Edition,3114A,Page:3-36	No relaxation
16	Iron(as Fe)	mg/L	0.184	APHA 23 <sup>rd</sup> Edition,3500-Fe B,Page:3-80	No relaxation
17	Total Coliform	MPN/100	Nil	APHA 23 <sup>rd</sup> Edition,9222B,Page:9-81	Shall not be detectable in any 100 ml Sample
18	Fecal Coliform	MPN/100	Nil	APHA 23 <sup>rd</sup> Edition,9222 D,Page:9-89	Shall not be detectable in any 100 ml Sample
19	BOD	mg/L	<2	APHA 23 <sup>rd</sup> Edition,5210B,Page:5-6	No relaxation
20	COD	mg/L	<5	APHA 23 <sup>rd</sup> Edition,5220 b,Page:5-18	No relaxation

NOTE: (BOD) Biochemical Oxygen Demand, (COD) Chemical Oxygen Demand, (TSS) Total Suspended Solids, (TDS) Total Dissolved Solids.

For Envision Enviro Technologies North East

  
**Rimpi Sarma**  
 Environmental Chemist  
 Test Done By

  
**Dr. Pranita Chakraborty**  
 Quality Manager  
 Authorized Signatory

Note: : i) The results relate only to the parameters tested.  
 ii) The test report shall not be reproduced except in full, without written approval of laboratory  
 iii) Parameter no.11 to 18 were analysed by Department of Chemistry,B.Borooh College as per our MOU.  
**End of report**



Recognized by Pollution Control Board, Assam

**TEST REPORT:**

Report No: 211022\_1503163\_0  
ULR No:TC766922000000216P  
Sample ID No: EETNE/Sept/20/22/D  
Test Starting Date: 29/09/22

Date of Report: 10/10/22  
Date of sample receipt: 29/09/22  
Test completion Date: 10/10/22

Name & Address of Client	M/s. Lower Kopili Project. Near Lanka, Dist: Dima Hasao.				
Sample Description	Type: Surface Water(1 km U/S of dam site)	Source: Kopili River	Location: Latitude: N 25°39'/37.82 Longitude: E 92°47'/26.10		
	Sample collected by: M/s. En-vision Enviro Technologies North East				
Sample Collection Particulars	Date: 28/09/2022	Time: 10:42 A.M	Temperature: 27°C	Quantity Drawn: 4L	Sampling Method: EETNE/SOP/02

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
1	p <sup>H</sup>	---	6.9	APHA 23 <sup>rd</sup> Edition, 4500 H <sup>+</sup> , Page: 4-95	6.5-8.5
2	Turbidity	NTU	3.56	APHA 23 <sup>rd</sup> Edition, 2130, Page: 2-13	5
3	TDS	mg/L	32.4	APHA 23 <sup>rd</sup> Edition, 2540 C, Page: 2-69	2000
4	TSS	mg/L	67.9	APHA 23 <sup>rd</sup> Edition, 2540, Page: 2-70	---
5	Oil and GREASE	mg/L	<5	APHA 23 <sup>rd</sup> Edition, 5520 B, Page: 5-42	---
6	Dissolved Oxygen	mg/L	7.2	APHA 23 <sup>rd</sup> Edition, 4500-O C, Page: 4-146	100
7	Total hardness	mg/L	71.4	APHA 23 <sup>rd</sup> Edition, 2340 B, Page: 2-48	600
8	Calcium	mg/L	34.6	APHA 23 <sup>rd</sup> Edition, 3500-Ca B, Page: 3-69	200
9	Magnesium	mg/L	15.9	APHA 23 <sup>rd</sup> Edition, 3500-Mg B, Page: 3-86	100
10	Total Alkalinity	mg/L	36.7	APHA 23 <sup>rd</sup> Edition, 2320, Page: 2-37	600
11	Sulphate	mg/L	11.3	APHA 23 <sup>rd</sup> Edition, 4500-SO <sub>4</sub> <sup>2-</sup> E, Page: 4-199	400
12	Nitrates	mg/L	3.8	APHA 23 <sup>rd</sup> Edition, 4500-NO <sub>3</sub> <sup>-</sup> B, Page: 4-127	No relaxation
13	Phosphate	mg/L	<0.02	APHA 23 <sup>rd</sup> Edition, 4500-P, Page: 4-163	No relaxation
14	Salinity	%	0.5	APHA 23 <sup>rd</sup> Edition, 2520B, Page: 2-60	No relaxation
15	conductivity	µS/cm	90	APHA 23 <sup>rd</sup> Edition, 2520B, Page: 2-60	No relaxation

Page 1 of 2



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Phone : +91 8811095201 ♦ e-mail : envisionghy@gmail.com



Recognized by Pollution Control Board, Assam

Sample ID No: EETNE/Sept/20/22/D  
 Test Starting Date: 29/09/22

Date of sample receipt: 29/09/22  
 Test completion Date: 10/10/22

SI No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
16	Arsenic	mg/L	BDL	APHA 23 <sup>rd</sup> Edition,3114A,Page:3-36	No relaxation
17	Iron(as Fe)	mg/L	1.5	APHA 23 <sup>rd</sup> Edition,3500-Fe B,Page:3-80	No relaxation
18	Total Coliform	MPN/100ml	3	APHA 23 <sup>rd</sup> Edition,9222B,Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100ml	Nil	APHA 23 <sup>rd</sup> Edition,9222 D,Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	6	APHA 23 <sup>rd</sup> Edition,5210B,Page:5-6	No relaxation
21	COD	mg/L	22	APHA 23 <sup>rd</sup> Edition,5220 b,Page:5-18	No relaxation

For Envision Enviro Technologies North East, Guwahati

  
**Rimpi Sarma**  
 Environmental Chemist  
 Test Done By

  
**Dr. Pranita Chakraborty**  
 Quality Manager  
 Authorized Signatory

Note: i) The results relate only to the parameters tested.  
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 iii) Parameter no.11 to 19 are analyzed by Department of Chemistry, B. Borooah College as per our MOU.

**End of report**



Recognized by Pollution Control Board, Assam

**TEST REPORT:**  
Report No: 221010\_1503163\_0  
ULR No:TC76692200000218P  
Sample ID No: EETNE/Sept/22/22/D  
Test Starting Date: 29/09/22

Date of Report: 10/10/22  
Date of sample receipt: 29/09/22  
Test completion Date: 10/10/22

Name & Address of Client	M/s. Lower Kopili Project. Near Lanka, Dist: Dima Hasao.				
Sample Description	Type: Surface Water (8 km D/S of dam site)	Source: Kopili River	Location: Latitude: N 25°42'44.97// * Longitude: E 92°49'6.20//		
Sample collected by	M/s. En-vision Enviro Technologies North East				
Sample Collection Particulars	Date 28/09/2022	Time 4:50 P.M	Temperature 29°C	Quantity Drawn:4L	Sampling Method: EETNE/SOP/02

Sl No.	Parameters	Unit	Result	Reference Method
1	p <sup>H</sup>	---	7.00	APHA 23 <sup>rd</sup> Edition, 4500 H <sup>+</sup> , Page: 4-95
2	Turbidity	NTU	2.78	APHA 23 <sup>rd</sup> Edition, 2130, Page: 2-13
3	TDS	mg/L	35.0	APHA 23 <sup>rd</sup> Edition, 2540 C, Page: 2-69
4	TSS	mg/L	23.6	APHA 23 <sup>rd</sup> Edition, 2540, Page: 2-70
5	Oil and Grease	mg/L	<5	APHA 23 <sup>rd</sup> Edition, 5520 B, Page: 5-42
6	Dissolved Oxygen	mg/L	6.8	APHA 23 <sup>rd</sup> Edition, 4500-O C, Page: 4-146
7	Total hardness	mg/L	74.3	APHA 23 <sup>rd</sup> Edition, 2340 B, Page: 2-48
8	Calcium	mg/L	38.5	APHA 23 <sup>rd</sup> Edition, 3500-Ca B, Page: 3-69
9	Magnesium	mg/L	17.3	APHA 23 <sup>rd</sup> Edition, 3500-Mg B, Page: 3-86
10	Total Alkalinity	mg/L	121.6	APHA 23 <sup>rd</sup> Edition, 2320, Page: 2-37
11	Sulphate	mg/L	14.2	APHA 23 <sup>rd</sup> Edition, 4500-SO <sub>4</sub> <sup>2-</sup> E, Page: 4-199
12	Nitrates	mg/L	4.6	APHA 23 <sup>rd</sup> Edition, 4500-NO <sub>3</sub> <sup>-</sup> B, Page: 4-127
13	Phosphate	mg/L	BDL	APHA 23 <sup>rd</sup> Edition, 4500-P, Page: 4-163
14	Salinity	%	0.4	APHA 23 <sup>rd</sup> Edition, 2520B, Page: 2-60
15	Conductivity	µS/cm	90	APHA 23 <sup>rd</sup> Edition, 2520B, Page: 2-60





Recognized by Pollution Control Board, Assam

Sample ID No: EETNE/Sept/22/22/D  
 Test Starting Date: 29/09/22

Date of sample receipt: 29/09/22  
 Test completion Date: 10/10/22

SI No.	Parameters	Unit	Result	Reference Method
16	Chloride	mg/L	18.9	APHA 23 <sup>rd</sup> Edition,4500-Cl <sup>-</sup> B,Page:4-75
17	Arsenic	mg/L	<0.001	APHA 23 <sup>rd</sup> Edition,3114A,Page:3-36
18	Iron(as Fe)	mg/L	2.1	APHA 23 <sup>rd</sup> Edition,3500-Fe B,Page:3-80
19	Total Coliform	MPN/100	5	APHA 23 <sup>rd</sup> Edition,9222B,Page:9-81
20	Fecal Coliform	MPN/100	Nil	APHA 23 <sup>rd</sup> Edition,9222 D,Page:9-89
21	BOD	mg/L	8	APHA 23 <sup>rd</sup> Edition,5210B,Page:5-6
22	COD	mg/L	59	APHA 23 <sup>rd</sup> Edition,5220 b,Page:5-18

For Envision Enviro Technologies North East, Guwahati

  
**Rimpi Sarma**  
 Environmental Chemist  
 Test Done By

  
**Dr. Pranita Chakraborty**  
 Quality Manager  
 Authorized Signatory

Note: i) The results relate only to the parameters tested.  
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End of report \_\_\_\_\_



**TEST REPORT:**

Report No: 211022\_1503163\_0  
 ULR No:TC766922000000215P  
 Sample ID No: EETNE/Sept/19/22/D  
 Test Starting Date: 29/09/22

Date of Report: 10/10/22  
 Date of sample receipt: 29/09/22  
 Test completion Date: 10/10/22

Name & Address of Client	M/s. Lower Kopili Project. Near Lanka, Dist: Dima Hasao.				
Sample Description	Type: Surface Water(Submergence area, dam site)	Source: Kopili River	Location: Latitude: N 25°39'57.38''// Longitude:E 92°46'53.10''		
Sample collected by	M/s. En-vision Enviro Technologies North East				
Sample Collection Particulars	Date 27/09/2022	Time 10:49 A.M	Temperature 31°C	Quantity Drawn:4L	Sampling Method: EETNE/SOP/02

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
1	p <sup>H</sup>	---	7.00	APHA 23 <sup>rd</sup> Edition,4500 H*,Page:4-95	6.5-8.5
2	Turbidity	NTU	2.54	APHA 23 <sup>rd</sup> Edition,2130,Page:2-13	5
3	TDS	mg/L	32	APHA 23 <sup>rd</sup> Edition,2540 C, Page :2-69	2000
4	TSS	mg/L	58.6	APHA 23 <sup>rd</sup> Edition,2540,Page:2-70	---
5	Oil and GREASE	mg/L	<5	APHA 23 <sup>rd</sup> Edition,5520 B,Page:5-42	---
6	Dissolved Oxygen	mg/L	7.8	APHA 23 <sup>rd</sup> Edition,4500-O C,Page:4-146	---
7	Total hardness	mg/L	59	APHA 23 <sup>rd</sup> Edition,2340 B,Page:2-48	600
8	Calcium	mg/L	29.5	APHA 23 <sup>rd</sup> Edition,3500-Ca B,Page:3-69	200
9	Magnesium	mg/L	15.5	APHA 23 <sup>rd</sup> Edition,3500-Mg B,Page:3-86	100
10	Total Alkalinity	mg/L	36.7	APHA 23 <sup>rd</sup> Edition,2320,Page:2-37	600
11	Sulphate	mg/L	10.2	APHA 23 <sup>rd</sup> Edition,4500-SO <sub>4</sub> <sup>2-</sup> E,Page:4-199	400
12	Nitrates	mg/L	5.3	APHA 23 <sup>rd</sup> Edition,4500-NO <sub>3</sub> <sup>-</sup> B,Page:4-127	No relaxation
13	Phosphate	mg/L	<0.02	APHA 23 <sup>rd</sup> Edition,4500-P,Page:4-163	No relaxation
14	Salinity	%	0.2	APHA 23 <sup>rd</sup> Edition,2520B,Page:2-60	No relaxation
15	conductivity	µS/cm	81	APHA 23 <sup>rd</sup> Edition,2520B,Page:2-60	No relaxation





Sample ID No: EETNE/Sept/19/22/D  
 Test Starting Date: 29/09/22

Date of sample receipt: 29/09/22  
 Test completion Date: 10/10/22

SI No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
16	Arsenic	mg/L	<0.001	APHA 23 <sup>rd</sup> Edition,3114A,Page:3-36	No relaxation
17	Iron(as Fe)	mg/L	0.67	APHA 23 <sup>rd</sup> Edition,3500-Fe B,Page:3-80	No relaxation
18	Total Coliform	MPN/100ml	3	APHA 23 <sup>rd</sup> Edition,9222B,Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100ml	Nil	APHA 23 <sup>rd</sup> Edition,9222 D,Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	4	APHA 23 <sup>rd</sup> Edition,5210B,Page:5-6	No relaxation
21	COD	mg/L	121	APHA 23 <sup>rd</sup> Edition,5220 b,Page:5-18	No relaxation

For Envision Enviro Technologies North East, Guwahati

  
**Rimpi sarma**  
 Environmental Chemist  
 Test Done By

  
**Dr. Pranita Chakraborty**  
 Quality Manager  
 Authorized Signatory

Note: i) The results relate only to the parameters tested.  
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**End of report**

**TEST REPORT:**  
Report No: 221010\_1503163\_0  
ULR No:TC766922000000223P  
Sample ID No: EETNE/Sept/27/22/D  
Test Starting Date: 29/09/22

Date of Report: 10/10/22  
Date of sample receipt: 29/09/22  
Test completion Date: 10/10/22

Name & Address of Client	M/s. Lower Kopill Project. Near Lanka, Dist: Dima Hasao.				
Sample Description	Type: Surface Water	Source: Lanku Nala		Location: Latitude: N 25°39'49.8// Longitude: E 92°47'42.7//	
	Sample collected by: M/s. En-vision Enviro Technologies North East				
Sample Collection Particulars	Date	Time	Temperature	Quantity	Sampling Method: EETNE/SOP/02
	27/09/2022	10:26 A.M	29°C	Drawn:4Ltg	

Sl No.	Parameters	Unit	Result	Reference Method
1	p <sup>H</sup>	---	7.00	APHA 23 <sup>rd</sup> Edition, 4500 H <sup>+</sup> , Page:4-95
2	Turbidity	NTU	2.8	APHA 23 <sup>rd</sup> Edition, 2130, Page:2-13
3	TDS	mg/L	112.6	APHA 23 <sup>rd</sup> Edition, 2540 C, Page :2-69
4	TSS	mg/L	81.4	APHA 23 <sup>rd</sup> Edition, 2540, Page:2-70
5	Oil and Grease	mg/L	<5	APHA 23 <sup>rd</sup> Edition, 5520 B, Page:5-42
6	Dissolved Oxygen	mg/L	7.2	APHA 23 <sup>rd</sup> Edition, 4500-O C, Page:4-146
7	Total hardness	mg/L	58.6	APHA 23 <sup>rd</sup> Edition, 2340 B, Page:2-48
8	Calcium	mg/L	28.9	APHA 23 <sup>rd</sup> Edition, 3500-Ca B, Page:3-69
9	Magnesium	mg/L	14.5	APHA 23 <sup>rd</sup> Edition, 3500-Mg B, Page:3-86
10	Total Alkalinity	mg/L	215.8	APHA 23 <sup>rd</sup> Edition, 2320, Page:2-37
11	Chloride	mg/L	17.4	APHA 23 <sup>rd</sup> Edition, 4500-Cl <sup>-</sup> B, Page:4-75
12	Sulphate	mg/L	12.3	APHA 23 <sup>rd</sup> Edition, 4500-SO <sub>4</sub> <sup>2-</sup> E, Page:4-199
13	Nitrates	mg/L	3.1	APHA 23 <sup>rd</sup> Edition, 4500-NO <sub>3</sub> <sup>-</sup> B, Page:4-127
14	Phosphate	mg/L	<.02	APHA 23 <sup>rd</sup> Edition, 4500-P, Page:4-163
15	conductivity	µS/cm	190	APHA 23 <sup>rd</sup> Edition, 2520B, Page:2-60





Sample ID No: EETNE/Sept/27/22/D  
 Test Starting Date: 29/09/22

Date of sample receipt: 29/09/22  
 Test completion Date: 10/10/22

SI No.	Parameters	Unit	Result	Reference Method
16	Arsenic	µg/L	BDL	APHA 23 <sup>rd</sup> Edition,3114A,Page:3-36
17	Iron(as Fe)	mg/L	1.1	APHA 23 <sup>rd</sup> Edition,3500-Fe B,Page:3-80
18	Salinity	%	0.6	APHA 23 <sup>rd</sup> Edition,2520B,Page:2-60
19	Total Coliform	MPN/100 mL	3	APHA 23 <sup>rd</sup> Edition,9222B,Page:9-81
20	Fecal Coliform	MPN/100 mL	Nil	APHA 23 <sup>rd</sup> Edition,9222 D,Page:9-89
21	BOD	mg/L	7	APHA 23 <sup>rd</sup> Edition,5210B,Page:5-6
22	COD	mg/L	21	APHA 23 <sup>rd</sup> Edition,5220 b,Page:5-18

For Envision Enviro Technologies North East, Guwahati

  
**Rimpi Sarma**  
 Environmental Chemist  
 Test Done By

  
**Dr. Pranita Chakraborty**  
 Quality Manager  
 Authorized Signatory

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 iii) Parameter no.11 to 20 are analyzed by Department of Chemistry,B.Boroohah College as per our MOU.  
**End of report**

**SOIL ANALYSIS REPORT**

Rep.No: 221010\_1503163\_0

Date: 10/10/22

Name & Address of Client	M/s. Lower Kopili Project. Near Lanka, Dist: Dima Hasao.
Sample Description	Pre Construction Stage
Date of Sampling	28/09/22
Sample collected by	M/s. En-vision Enviro Technologies North East

Sl No.	Soil Parameters	Unit	Result	Reference Method
1	p <sup>H</sup>	---	6.5	Potentiometric
2	Soil type	---	Silt highly organic clay	Hydrometer
	Permeability of soil	Cm/sec	1×10 <sup>-6</sup>	Constant head test method
	Sand	%	72.1	Hydrometer
	Clay	%	10.4	Hydrometer
	Silt	%	17.5	Hydrometer
3	Nitrogen	kg/ha	86.3	Alkaline KMnO <sub>4</sub>
4	Phosphorus	mg/kg	11.2	Olsen method
5	Potassium	mg/Kg	28.9	NH <sub>4</sub> -acetate extraction
6	Electrical conductivity	mS/cm	10	Conductivity Meter
7	Water holding capacity	%	21.6	Standard method
8	Organic matter	%	5.4	Titrimetric



Page 1 of 2

Sl No.	Parameters	Unit	Result	Reference Method
9	Organic Carbon	%	3.13	Rapid Dichromate Oxidation Technique
10	Iron	g/kg	35.2	Flame AAS(mg/kg) *
11	Copper	mg/kg	7.5	Flame AAS
12	Nickel	mg/kg	12.9	Flame AAS
13	Manganese	g/kg	8.7	Flame AAS(mg/kg)
14	Zinc	mg/kg	33.2	Flame AAS
15	Arsenic	mg/kg	3.4	HG- AAS
16	Cadmium	mg/kg	0.02	Flame AAS
17	Lead	mg/kg	4.5	Flame AAS
18	Chromium	mg/kg	6.3	Flameless AAS
19	Aluminum	mg/kg	BDL	Flameless AAS

For En-vision Enviro Technologies North East, Guwahati

  
Dr. Pranita Chakraborty  
(Quality Manager)  
Authorised Signatory

Note: i) The results relate only to the parameter tested.  
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iii) Parameter no.9 to 19 are analysed in B. Booroah College as per our MOU.

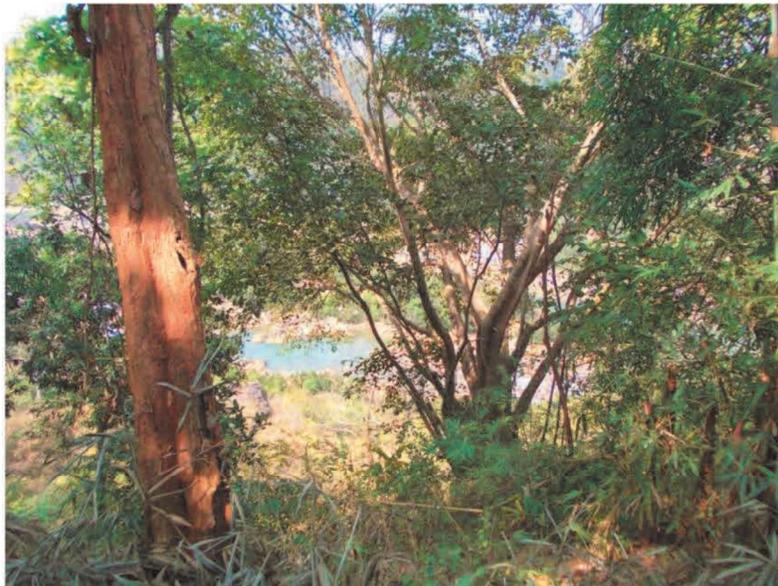
End of Report

Page 2 of 2



## **CONSERVATION PLAN FOR FLORA AND FAUNA (BIODIVERSITY)**

For Lower Kopili Hydroelectric Project (120 MW)



**Assam Power Generation Corporation Limited**

## **CONSERVATION PLAN FOR FLORA AND FAUNA (BIODIVERSITY)**

### **1 BIODIVERSITY CONSERVATION**

#### **INTRODUCTION**

Conservation is the sustainable use of natural resources, so that it is preserved for future generation as well. Natural conservation involves proper management of natural wealth, places that sustain these resources besides the human pressure that affect the resources. The need for conservation, preservation and management of biological diversity arises because of threats to natural ecosystems by anthropogenic activities. In view of the foreseen disturbance and degradation of natural ecosystems, a compensatory afforestation plan and biodiversity conservation and management plan has been proposed for Lower Kopili hydroelectric project.

#### **1.1 COMPENSATORY AFFORESTATION**

The Indian Forest Conservation Act (1980) stipulates:

- If non-forest land is not available, compensatory plantation is to be established on degraded forest lands, which must be twice the forest area affected or lost.
- If non- forest land is available, compensatory forest are to be raised over an area equivalent to the forest area affected or lost.

The total land requirement of the project is 1577 ha. The private land to be acquired for the project is 1054 ha. The forest land to be acquired for the project is 523 ha. Therefore compensatory afforestation required for equivalent area is about 523 ha of land needs to be afforested. The afforestation work is to be done by the Forest Department. Local species shall be preferred for plantation under compensatory afforestation under CAMPA. For this APGCL has already received demand note from concerned Divisions of Forest for deposition of the amount to CAMPA fund amounting to Rs. 23,91,35,775.00.

	Compensatory afforestation	Overhead
Karbi Anglong	14584098	7292049
Dima Hasao	144839752	72419876

#### **1.2 CAT Plan**

Accelerated soil erosion in the catchment area of the reservoirs and transport of detached material through the drainage network gives rise to a series of problems, notably depletion of flow capacity, steady loss of storage capacity, consistent drop in hydro-electric power generation and frequent floods. The loss of dead and live storage leads to heavy economic losses due to reduced life span of reservoirs. Therefore, extensive soil conservation and watershed management programmes are needed to minimize the damage to the catchment and mitigation of soil erosion problems. As a

part of the CEIA study, a Catchment Area Treatment Plan has been prepared. Silt Yield Index (SYI) method has been used to prioritize sub-watershed into various erosion categories.

The CAT Plan has been formulated for intervening draining catchment i.e. up to the proposed diversion structure of Lower Kopili H. E. Project on Kopili river. The total catchment area at proposed Lower Kopili HEP site is 2076.62 sq km while at proposed Kopili Dam HEP is 1256 sq km. Thus, the free draining catchment area proposed to be treated in the present study is 820.62 sq.km (82062 ha).

CAT Plan amounting Rs. 2829.67 Lakhs has been approved by the PCCF&HOFF, Govt. of Assam. Accordingly the amount will be deposited by APGCL in the CAMPA fund.

### **1.3. Soil and Moisture Conservation Plan**

The main objective of soil moisture conservation is to minimize the amount of water lost from the soils through evaporation (water loss directly from the soil) and transpiration (water loss occurring through the plants) – or combined, the evapotranspiration. Forest is the origin for the streams and rivers, therefore it is very important to conserve soil and moisture in its catchment area. The Department has started soil and moisture conservation works such as check-dams, gully plugging, and forest tanks. Soil and moisture Conservation works have become integral part of the Forest Development.

Soil Moisture Conservation works in the forest area marked for the plantation activity are carried on watershed basis. This approach is aimed at enhancing land productivity and to increase the soil moisture availability for a longer period.

#### **Nature of SMC Works**

Emphasis is given to the drainage line treatment. The above described SMC works are indicative and general. SMC works on the site are carried out as per the site specific approved treatment plan.

#### **SMC works**

There is a variety of methods that can be used to conserve soil moisture. Most of these are relatively low cost and complexity approaches, primarily relying on the presence of required materials and technical capacity locally. Many of the methods rely on providing some kind of cover for the soil to minimize evapotranspiration and direct soil exposure to heat and sun. Generally, most methods used for soil quality improvement and conservation, will also yield benefits to soil moisture conservation.

#### **Examples of methods for reducing excess soil moisture loss include following:**

- **Spreading manure or compost over the soil** – this minimizes evapotranspiration and also provides valuable nutrients to the soil through processes of decomposition.

- **Mulching** – mulch is a layer of organic (or inorganic) material that is placed on the root zone of the plants. Examples of mulch materials include straw, wood chips, peat. Inorganic mulch in form of plastic sheeting is also used. Mulching is most suited for low to medium rainfall areas, and less suited for areas with very wet conditions.
- **Conservation tillage** – reducing or, in extreme cases, completely eliminating the tillage to maintain healthy soil organic levels which increases the soils capacity to absorb and retain water. Conservation tillage is a specific type of such approach where crop residue is left on the soil to reduce evapotranspiration, and protect soil surface from wind, sun and heavy rain impacts.
- **Crop rotation** – growing different types of crops every season helps improve soil structure and thus water holding capacity. Examples include rotating deep-rooted and shallow rooted crops that make use of previously unused soil moisture, as plants draw water from different depth levels within the soil. Crop rotation may also improve soil fertility and help control pests and diseases.
- **Green manuring** – growing of plant materials with the sole purpose of adding to the soil for improved organic matter and nutrients. The improved soil quality then also improves water retention capacity.
- **Deep tillage** – suited for some areas and soils, deep tillage can help increase porosity and permeability of the soil to increase its water absorption capacity.
- **Mixed cropping and interplanting** - cultivating a combination of crops with different planting times and different length of growth periods.
- **Contour ploughing** – by ploughing the soil along the contour instead of up- and downward slopes, the velocity of runoff is reduced, creating even barriers, and more water is retained in the soils and distributed more equally across the cropland.
- **Strip cropping** - growing erosion permitting crops and erosion resisting crops in alternate strips.
- Other soil moisture conservation techniques may include rainwater harvesting to minimize runoff and collect water for use on site.
- Contour dykes, Van-talav, Small earthen Check dams are prepared depending on site conditions. Emphasis is given to contour line treatment with small and medium SMC works.

So far as the SMC and area development works are concerned, entire coupe would be treated as an unit. In area prone to soil erosion, pukka nala-bunds or check dam are constructed. Ring bunds at the heads of the nala and gullies are also prepared. Seed sowing of appropriate species such as bamboo or khair, Broom grass are sown on the outer side of stonewall, internal plantation demarcation line or on other soil based SMC works. An amount of Rs 3,98,55,963.00 has been proposed by concerned DFOs for payment in CAMPA Fund by APGCL.

Dima Hasao	36209938.00
Karbi Anglong	3646025.00

#### 1.4 Habitat Improvement Programme

Habitat improvement programme is an integral part of biodiversity management. This programme consists of bringing into useful association of those condition needed by a species to reproduce and survive.

The proposed project will not impinge on any Protected Area / Biological Corridors or corresponding buffer zones.

The proposed project does not affect important species and biodiversity areas (both upstream and downstream of project area).

The following activities have been proposed for habitat improvement programme:

**Afforestation:** Area under forest and tree cover will be expanded through systematic planning and implementation of afforestation and rehabilitation programme in degraded and open forests and available non forest lands.

Regeneration of felled areas will be ensured in a time bound manner and productivity of plantations will be increased through use of improved seeds and planting stock. The indigenous fruit bearing plants, vital from wildlife point of view are proposed to be planted so as to enrich the habitat & ensure the sufficient availability of food. Monoculture will be discouraged and mixed plantations of broad-leaved fodder, fuel wood and wild fruit species will be promoted. This activity will increase forest cover and will provide habitat to the animals. Afforestation programme in the degraded Forest Compartments is proposed to be carried out with species suitable for the area and shall be finalized and executed by the Forest Department. An amount of Rs.20.0 lakhs is proposed to be earmarked for this purpose.

**Avi-fauna :** Forests are vital for the survival, foraging, breeding and nesting of avifauna. Natural forests provide a variety of food materials to the birds not only in the form of nectar of flowers, fruits, seeds etc. in the trees, shrubs, herbs and grasses but they also contain a large number of insects eaten by birds. In the forests, food is always available for the faunal component. Although most floral species flower during spring through summer but fruit maturation and seed ripening takes place in them throughout the year. Therefore, first strategy of improvement of habitat for birds is avoiding nest predation or brood parasitism through maintenance of large contiguous forest tract. These areas have the ability to support the largest number of forest interior birds and will also be

more likely to provide habitat for area sensitive species. It is more practicable to protect the existing forest area rather than creating new forest area.

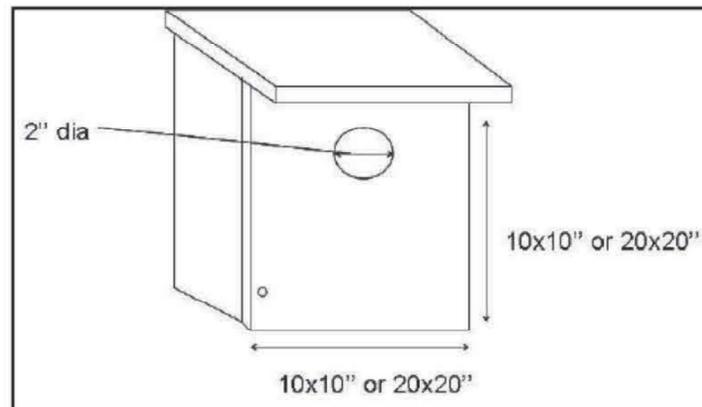
Another measure for habitat improvement for avifauna is to be installation of artificial nest boxes in the influence zone and catchment area of the project after consultation with the forest department as well as local NGOs. These nest boxes have been found to be quite beneficial for attracting hole nester birds. The size and capacity of boxes vary from one species to another. Provision for providing the same is given in Table-1.1 along with overall budget estimates.

**Features of a Nest Box:**

The characteristic features of nest box are listed below and shown in Figure-1.1.

- Untreated wood (Jamun, mango, pine, cedar or fir)
- Thick walls (at least ¾ inches)
- Extended, sloped roof
- Rough or grooved interior walls
- Recessed floor, coated with primer and paint
- Drainage holes
- Ventilation holes
- Easy access for monitoring and cleaning
- Sturdy construction
- No outside perches

The entrance hole should have a 2 inch diameter and 6 inch depth from entrance hole. Nest boxes are placed on trees at height from 10-12 ft. Such nest boxes designs have been used with success. The nest boxes shall be located in vicinity to reservoir and other water bodies in the study Area.



**Figure 1.1: Nest Box**

It is proposed that one qualified person be hired for a period of five years.

### Other Measures

With the change in nature of landscape, its aquatic and terrestrial vegetation will change. The habits of the aquatic birds. The aquatic culture i.e. both floral and faunal environments will change to the large extent e.g. in the initial years of the reservoir water storage. The other measures recommended for improvement of habitats are:

- Fodder and wild fruit plantation for wild animals and for roosting, breeding and hiding cover for migratory birds etc.
- Annual bird count of migratory birds by involving locals and bird experts.
- Removal of weeds and rehabilitation with local fruit bearing species in gaps.
- Anti-grazing drive in draw down area to protect the bird breeding areas in proximity to reservoir during breeding season.
- Construction of watch towers

An amount of Rs. 106.2 lakh shall be earmarked for habitat improvement of avi-fauna in the study area. The details are given in Table-1.1.

**Table-1.1: Cost of habitat improvement for avi-fauna in the Study Area**

S. No.	Particulars	Amount (Rs. lakh)
<b>A</b>	<b>Non-recurring Cost</b>	
1	Cost of nests of different sizes (10"x10" to 20"x20"; average cost Rs. 1500 per wooden box) and installation in the area along the green belt (1000 Nos)	15
2	Repair and maintenance of the nests	4.5
3	Fodder and wild fruit plantation for wild animals and for roosting, breeding and hiding cover for migratory birds etc.	15
4	Annual bird count of migratory birds by involving locals and bird experts.	10.0
5	Removal of weeds and rehabilitation with local fruit bearing species in gaps.	20
6	Anti-grazing drive in draw down area to protect the bird breeding areas in	10
7	Construction of watch towers	10.0
	<b>Sub-Total (A)</b>	<b>84.5</b>
<b>B</b>	<b>Recurring Cost (for 4 years)</b>	
1	Salary for one qualified person @ Rs. 30,000 per month for implementation and data collection including 10% escalation	16.7
2	Contingencies (including avifaunal biodiversity awareness programme for the local inhabitants)	5.0
	<b>Sub-Total (B)</b>	<b>21.7</b>
	<b>Total (A+B)</b>	<b>106.2</b>

### 1.1 Awareness for Use of Non-Conventional Energy Sources

Awareness initiatives to promote use of non-conventional energy devices like Solar Cookers, Solar water heaters, Solar lamps, LPG, Bio Gas Plants etc. will be conducted in the villages to reduce the requirement of fuel-wood and minimize over dependency of villagers on wood.

To promote the use of such devices an allocation of Rs. 30.0 lakh is proposed for installation of solar powered equipments. A total amount of Rs. 43.2 lakh shall be earmarked for this activity. The details are given in Table-1,2.

**Table-1.2: Budget earmarked for creation of awareness for use of non-conventional Energy sources**

S. No.	Particulars	Qty	Rate (Rs. lakh)	Amount (Rs. lakh)
1	Awareness Programmes – 4 nos. per year for 4 years	16	0.2	3.2
2	Installation of solar powered equipment	Lump sum		30.0
3	Recognition and Rewards	100	0.1	10.0
	<b>Total</b>			<b>43.2</b>

### 1.2 Anti-poaching Measures

Hunting and poaching is a possibility due to the presence of construction workers. The possibility of hunting and trapping by workers during construction period will be site-specific and will decrease once the work is completed. The overall magnitude of impact is considered to be low, extent is site specific and duration is short period.

**Awareness Raising Programs:** With the construction of the access roads, the accessibility of humans to the LKHEP project area will increase, which may increase the risk of poaching. Raising awareness will be an important means to mitigate this risk. Awareness will be raised among workers and contractors regarding illegal poaching and copies of the Indian Wildlife Act, Biodiversity Act, Prevention of Cruelty to Animals Act (1986), other relevant Rules and Regulations as well as Biodiversity Mitigation and Monitoring tables (see section 2.4 and 2.5) will be made available in the local language. Copies will be made available at the project site and forest ranger stations of the vicinity. Workers must be made aware of the fines and penalties for poaching, as well as the risk of job loss, if caught in these illegal activities. This will be done during the pre-construction phase, but after the Contractor has been selected and continue intermittently through the construction phase.

**Strengthen Patrolling:** To minimize the risks of poaching, awareness raising programs will be combined with an increase in patrolling by local forest rangers (in coordination with forest department) and construction of check posts and watch towers at key locations. The choices of location of check posts and watch towers will be guided by consultations with forest rangers in the area. To support enhanced patrolling, the project will provide assistance through purchase of equipment such as GPS, binoculars cameras, bikes, camera traps, etc.

**Community Watch Program:** The project will also discuss possibilities for funding a community watch program, through hire of village guards to alert forest rangers officials of any illegal activities in the worker camps or at project sites.

For the improvement of vigilance and measures to check poaching number of measures described below would be undertaken.

During construction phase in and around the main construction areas, i.e. the dam site, powerhouse site, etc. where construction workers congregate, some disturbance to the wildlife population may occur. The terrain is hilly & difficult, therefore, the wildlife protection force adequately equipped with watch towers, wildlife personnel and other necessary equipment be deployed to prevent poaching in the area. The measures proposed for wildlife protection are outlined in the following paragraphs.

**Purchase of anti-poaching kits:** To capture and translocate wild animals out of human habitations or agricultural lands, various trapping equipments pertaining to anti-poaching activities are needed. For this an amount of Rs. 20 lakh has been earmarked. The antipoaching kits will include equipments for self defense of the staff as well.

**Infrastructure Development:** This includes anti-poaching huts, rock shelters development and residential quarters for forest guards. For effective monitoring, one

watch tower is also proposed to be established at an identified place having high pressure of biotic interference.

The basic amenities for the field staff shall be provided to enable them to do effective patrolling in the areas. For watch tower and accommodation an amount of Rs. 50 lakh has been earmarked.

**Purchase of Survey equipment and Vehicles:** In order to improve network and vigilance it is required to procure communication equipment like walkie talkie, IT infrastructure to document and develop a database, altimeters, G.P.S., spotoscope, binoculars, video as well as digital still cameras are essential. Purchase of field vehicle will help in increased vigilance.

For better communication and purchase of survey equipment an amount of Rs. 40 lakh has been earmarked.

**Construction of Check posts:** To improve vigilance for anti-poaching, better protection, enforcement for control grazing practices, control-grazing-cum-anti poaching check post shall be constructed. An amount of Rs.25 lakh has been earmarked for this purpose.

The details are given as below:

#### Salary

- Guards (6 nos.) @ Rs.8000 per month Rs. 5,76,000
  - One range officer @ Rs.20000 per month Rs. 2,40,000
  - Total cost for one year Rs. 8,16,000
- Cost for 4 years Rs. 37.86 lakh  
(Assuming 10% increase per year)

An amount of Rs. 172.86 lakh has been earmarked for implementation of various measures as a part of Wildlife Protection Plan. The details are given in Table-1.3.

**Table-1.3 : Measures for implementation of Wildlife Protection Plan**

S. No.	Particulars	Amount (Rs. lakh)
<b>Non-recurring</b>		
1	Anti Poaching Kits	20.00
2	Infrastructure	50.00
3	Survey equipment & vehicle	40.00
4	Check posts	25.00
5	Salary for wildlife protection force	37.86
	<b>Total</b>	<b>172.86</b>

### 1.3 Training & Publicity Programmes

Under this programme, the following activities are proposed:

- Training shall be imparted to the school teachers in the project area for introduction of environmental education among the school children and exchange of knowledge on environment and ecology between the monastic and village schools.
  - Publishing of research documents, pamphlets, brochures, hoardings
  - Advertisement of hazardous effect of fire through press, sign boards and public meetings will form the important activities under this component.
- An amount of Rs. 10 lakh has been earmarked for this purpose.

### 1.4 BUDGET

A total provision of Rs. 352.26 lakh has been earmarked for biodiversity conservation. The details are given in Table-1.4.

**Table-1.4: Estimated cost of Biodiversity Conservation and Management Plan implementation**

S.No.	Particulars	Cost (Rs. Lakhs)
<b>(A)</b>	Biodiversity Conservation & Management Plan	
<b>1</b>	Afforestation	20.00
<b>2</b>	Habitat improvement for avi-fauna	106.20
<b>3</b>	Use of Non-Conventional Energy Sources	43.20
<b>4</b>	Forest & Wildlife protection	172.86
<b>5</b>	Training & publicity	10.00
	<b>Sub-total (A)</b>	<b>352.26</b>

**Minutes of the Meeting of 1<sup>st</sup> Multi Disciplinary Committee (MDC) in respect of 120 MW Lower Kopili Hydro Electric Project (LKHEP) in the districts of Dima Hasao and Karbi Anglong, Assam held on 6<sup>th</sup> May, 2022 at Conference Hall (3<sup>rd</sup> Floor), Bijulee Bhawan, Assam Power Generation Corporation Limited, Guwahati.**

1. The Meeting of MDC of LKHEP was chaired by Shri. Mridul Saikia, Chief General Manager (PP&I), APGCL cum Project Director LKHEP. At the onset Chairman welcomed all the members present and briefed about the project and described the roles and responsibilities of the sectoral experts.
2. MoEF&CC has accorded Environmental Clearance vide No.J-12011/26/2012-IA-I. Dated 4<sup>th</sup> September, 2019 for the 120 MW Lower Kopili Hydro Electric Project (LKHEP).
3. After a brief power point presentation, it was highlighted that Environment Clearance stipulations and the compliance adhered so far. Details of the project components and the salient features of the project along with the possible impact and the mitigation plan suggested in the EMP of EIA were explained.
4. Dr. Pranab Bujarbaruah, raised query on direct forest dependency of the communities and the loss of forest cover. In reply to that APGCL explained the following.

The land acquisition for revenue land has been done through the RFCTLARR Act 2013 and ADB's safeguard policy SPS 2009. It covers all the possible social impacts and has been compensated accordingly. Over and above, APGCL has agreed to provide various components in local area development like (i) Educational facilities (ii) Healthcare facilities (iii) Construction of community toilets and (iv) Development of training/educational institute.

Against the loss of forest cover Compensatory Afforestation, Green Belt Development, Soil and Moisture conservation, Catchment Area Treatment and during the implementation Biodiversity Conservation Plan along with other conservation activities will be taken up to compensate the forest loss. As per Government norms the ratio is 1:1 but considering all the components of plantation it will come around 1:3 which is above the ADB's requirement 1:2 to achieve No net Loss on Biodiversity.

5. Dr. (Sri) C. Muthukumarvel, IFS, Chief Conservator of Forests & Nodal Officer (FC Act) enquired about the Status of the tree felling in the project impacted area and the status of Compensatory Afforestation. APGCL responded that all the trees felling are done through the respective Forest Divisions. Tree felling is not completed in the Karbi Anglong West division and felling of the trees in the reservoir area is remaining. Regarding Compensatory Afforestation, Addl. Principal Chief Conservator of Forest & Chief Executive Officer, CAMPA, Assam informed that initiation of plantation will be taken up in this financial year in both the divisions.
6. Mr. C. J. Saikia asked about the green belt development and requested to share the EIA report. APGCL explained about the plan for plantation and agreed to share the EIA report with all the experts through email.
7. The meeting ended with a vote of thanks from the chair.
8. The list of the participants is attached as ANNEXURE- 1.

## LOWER KOPILI HYDRO ELECTRIC PROJECT 120 MW

1<sup>st</sup> Multi Disciplinary Committee Meeting

Date : 06.05.2022 Venue : APGCL, Guwahati-781001

	Name	Organization	Contact Number	Email	Signature
1	M. SAIKIA	CGM APGCL	98640-17180	mitapuro@yahoo.com	
2	Jk. Sachin Mohan Singh	GM (P). APGCL	9869102918	singh_sachi@rediffmail.com	
3	AKSHAY TALUKDAR	DGM (PPLI), APGCL	9435139416	akstallk13@gmail.com	
4	Ph. Anarandha Singh	DGM (PPLI) (E) APGCL	9365533072	anarandhasinghman@gmail.com	
5	DR PRANAB BUJARBARUA	Asst. Professor Dept. of Botany Hemidurgin College	943510597	pbujarbarua@gmail.com	
6	C. J. SAIKIA	Soil Conservation Deptt. Joint Director, Lower Assam Circle.	9435381743	cjsaikia1@gmail.com	
7	Deepak K. Baruah	Environmental- Expert. APGCL	9435113521	deepakbaruah007@gmail.com	

	Name	Organization	Contact Number	Email	Signature
8	Sangram Singh	AFRY India Pvt Ltd.	9990432700	langram.singh@afry.com	
9	Gunjan Nath	APGCL	7399924917	gunjannath@bnc.com	
10	Haimoy Jyoti Pandit	APGCL	98641-50347	haimoy.pandit@apgcl.org	
11	Ranjit K. Hazarika	APGCL	86386-51918	hazarika072@gmail.com	
12	Mitul Das	APGCL	9859259477	dasmitul18@gmail.com	
13	Dr. Jayanta Das	PMC, AFRY	9435406966	jayanta.das@afay.com	
14	Dr. (Sri) C. Muthukumarvel, IFS	Chief Conservator of Forests & Nodal Officer (FC Act)	9435500123	addlpccf.nodal@gmail.com	Attended virtually



  
**GOVERNMENT OF ASSAM**  
**OFFICE OF THE DISTRICT MAGISTRATE::KARBI ANGLONG DISTRICT::DIPHU**

③  
AUM(C)PMU-LK  
Discum  
lle  
22/10/19

No.KADC/FR Act/2019/36  
Dated Diphu, the 29<sup>th</sup> October 2019

To,  
The Deputy Commissioner,  
Dist- West Karbi Anglong, Hamren.

Sub : Lower Kopili H.E. Project- Environment clearance regarding.

Ref : No.APGCL/CGM(H)/W/2007/140/Pt-VI/29, dated 15/10/2019

Matter discussed with P3 (PMU),  
B. Hazarika, JMLD  
Pl- file  
25/10/2019

In inviting a reference to the subject cited above, I have the honour to forward herewith a copy of letter alongwith enclosures received vide letter no. as referred above from the Project Director, Lower Kopili H.E. Project, APGCL, Bijulee Bhawan, Paltanbazar, Guwahati which is self explanatory regarding disply of Environment Clearance on the Lower Kopili H.E. Project in the Office premises.

This is for favour of kind information and necessary action.

Yours faithfully,

Encl: As above- 10 (ten) sheets.

Addl. Deputy Commissioner,  
Karbi Anglong, Diphu

Memo No.KADC/FR Act/2019/36-A  
Dated Diphu, the 29<sup>th</sup> October 2019

Copy to:

1. The Project Director, Lower Kopili H.E. Project, APGCL, Bijulee Bhawan, 3<sup>rd</sup> Floor, Paltanbazar, Guwahati-01 for information. As per your letter referred above, the same is displayed in the Notice Board of the Office premises of office of Deputy Commissioner, K/ Anglong, Diphu.
2. C.A. to D.C. for kind appraisal of the Deputy Commissioner, K/ Anglong, Diphu.

  
Addl. Deputy Commissioner,  
Karbi Anglong, Diphu

WEDNESDAY, OCTOBER 16, 2019

THE ASSAM TRIBUNE, GUWAHATI 7

**ASSAM POWER GENERATION CORPORATION LIMITED**  
**NOTICE**  
It is hereby informed to the general public that Ministry of Environment, Forest and Climate Change, Govt. of India has accorded Environment Clearance for the Lower Kopili Hydro Electric Project (120 MW) in Dima Hasao District and Karbi Anglong districts of Assam vide letter No. J-12011/26/2012-IA-I dated 4<sup>th</sup> September, 2019.  
The copy of the EC is available in APGCL website i.e. [www.apgcl.org](http://www.apgcl.org)  
Project Director (PMU), LKHEP, APGCL

৩০ অক্টোবৰ, বুধবাৰ, ২০১৯ চন  
দৈনিক জনমভূমি

দেও-বিদেও বাণিজ্য

Guwahati, Wednesday, October 16, 2019 ৭

**ASSAM POWER GENERATION CORPORATION LIMITED**  
**NOTICE**  
It is hereby informed to the general public that Ministry of Environment, Forest and Climate Change, Govt. of India has accorded Environment Clearance for the Lower Kopili Hydro Electric Project (120 MW) in Dima Hasao District and Karbi Anglong districts of Assam vide letter No. J-12011/26/2012-IA-I dated 4<sup>th</sup> September, 2019.  
The copy of the EC is available in APGCL website i.e. [www.apgcl.org](http://www.apgcl.org)  
Project Director (PMU), LKHEP, APGCL



**ASSAM POWER GENERATION CORPORATION LIMITED**

Registered Office: Bijulee Bhawan, 3<sup>rd</sup> floor, Paltanbazar, Guwahati-781 001, Assam

**Shri. Mridul Saikia**  
**Chief General Manager (PP&I),**  
**Project Director (PMU)**  
E-mail: mridul.saikia@apgcl.org

No: APGCL/CGM (H)/W/2007/140/Pt-VI/54

Dated: 28/11/2022

To,

The Director  
IA-I Division  
Ministry of Environment, Forest & Climate Change  
Government of India  
Indira Paryavaran Bhawan  
3<sup>rd</sup> Floor, Vayu Wing, Jor Bagh Road  
New Delhi-110003

Sub: Environmental Clearance for Lower Kopili HEP (120 MW) in Karbi Anglong & Dima Hasao, Assam by M/s Assam Power Generation Corporation Ltd. accorded by MoEF&CC vide Reference No. No. J- 12011/26/2012-IA-I dated 4<sup>th</sup> September, 2019 – reg. appraisal w.r.t. minor change of few components.

Sir,

With reference to the subject cited above, it is for your kind information that some of the components of the project has been shifted from the forest land to the Revenue Land as per the recommendation of Forest Advisory Committee dated 26.10.2018 and 11.01.2019, for which, the muck disposal site and miscellaneous areas has been shifted to revenue land, keeping 198.746 Ha as green belt within the diverted forest land. Subsequently Forest Clearance and Environment Clearance was accorded.

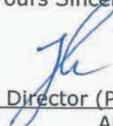
During the detail designing and execution of the EPC contract minor adjustments were made with the approval from Central Electricity Authority, Central Water Commission, Geological Survey of India, Central Soil and Materials Research Station, GOI keeping the power generation capacity of 120 MW, location of the Dam axis, FRL of 226m, alignment of HRT remaining same as mentioned in the EC. But the height of the dam was reduced from 70.13m to 66.5m without changing the submergence area of 620 Ha as the FRL (226m) will remain same. The reduced height will certainly reduce the requirement of minor minerals for construction and APGCL will also support plantation for 1 : 3 through CA, CAT Plan, S&M conservation plan, Green belt development etc to achieve 'no net loss of biodiversity'.

The salient features as approved by the CEA, CWC, GSI, etc are attached for your ready reference.

This is for your kind appraisal. Your kind cooperation in the matter is highly solicited.

Encl: As above

Yours Sincerely,

  
Project Director (PMU),  
APGCL

Copy to:

1. The Managing Director, APGCL, Bijulee Bhawan, Paltan Bazar, Ghy-01, for kind information
2. The Inspector General of Forests, Ministry of Environment, Forest and Climate Change, Integrated Regional Office, Guwahati, 4th Floor, HOUSEFED Building, G.S. Road Rukminigaon, Guwahati – 781022, for favour of kind information
3. Relevant file

**Salient Features of LKHEP along with Changes and Implications on the EIA**

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
<b>PROJECT LOCATION</b>				
State	Assam	No change	NA	No impact.
District	East of West Karbi Anglong and West of Dima Hasao (North Cachar) Hills District			
River	Kopili			
Diversion Site Latitude	25°39'57.39"N			
Longitude	92°46'53.62"E			
Powerhouse Site Latitude	25°41'54.02"N			
Longitude	92°48'15.98"E			
Nearest railway station	Lanka (BG), 48 km away			
Nearest road	Lanka – Garampani road			
Nearest township	Lanka 40 km away			
<b>HYDROLOGY</b>				
Catchment area	2,076.62 sq. km	No change	NA	No impact.
Snowfed catchment area	0 sq. km	No change		
Lower Kopili (Uncontrolled catchment area)	788 sq. km	No change		
Average annual rainfall	1,557 mm	No change	NA	No impact.
Annual evaporation rate	638.81 mm	No change	NA	No impact.
Temperature	Summer – 23°C to 32°C Winter – 6°C to 14°C	No change	NA	No impact.
90% dependable yield	2,184.4 MCM	2,214.64 MCM	Earlier 90% dependable yield was as per the approved flow series of 10 years (From 1998-99 to 2009-10) during TEC of DPR. Later, at the time of MOC, the flow series is updated, and final approved flow series is for 16 years, and dependable yield also changed.	No implication in EIA.
50% dependable yield	2,483.6 MCM	2,466.90 MCM		No implication in EIA.
Flood discharge for river diversion (25 years) Non monsoon flow (Nov. to May)	720 m <sup>3</sup> /s	No change	NA	No impact.
Standard Project Flood (SPF)	7,510 m <sup>3</sup> /s	No change	NA	No impact.
Probable Maximum Flood	11,030 m <sup>3</sup> /s	No change	NA	No impact.

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
(PMF)				
Sedimentation rate	0.1 Ha-m / km <sup>2</sup> /year	No change	NA	No impact.
<b>RESERVOIR</b>				No impact.
Reservoir spread (at FRL)	552 ha but intimated to MoEFCC during FC and it was also mentioned in the DPR, 2015	620 ha – No change	NA	No additional impact.
Maximum water level (MWL)	EL 229.60 m	EL 226.00 m	<p>As per MOC, CEA</p> <ul style="list-style-type: none"> <li>As per results of physical model studies, PMF passed at FRL itself for n-1 condition.</li> <li>MWL is lowered by 3.60 m, from 229.6 m to 226 m, by increasing the opening size of radial gated spillway bays and by raising the spillway crest level.</li> <li>MWL lowered to FRL, resulting optimisation of concrete quantities due to reduction in dam height and base width.</li> </ul>	The MWL reduced to 226.0m, meaning there is no difference between the MWL and FRL. Now FRL is 226.0m and dam top is at 229.0m. No impact.
Full reservoir level (FRL)	EL 226.00 m	No change	NA	No impact.
Minimum draw down level (MDDL)	EL 202.00 m	No change	NA	No impact.
Capacity at FRL	106.29 MCM	No change	NA	No impact.
Capacity at minimum draw down level	29.00 MCM	No change	NA	No impact.

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
Live storage	77.29 MCM	No change	NA	No impact.
<b>DAM</b>		No change		
Type	Concrete Gravity Dam	No change	NA	There is no change in the Full Reservoir Level (FRL) of the DAM and the size of submergence area remains same (620Ha) as such there is no additional impact due to reduction in the Dam height. Moreover use of natural resources like stone aggregate, sand, cement will be less which is beneficial to the environment.
Average river bed level at dam axis	EL 174.00 m	No change	NA	
Deepest river bed level	EL 172.00 m	No change	NA	
Deepest foundation level	EL 162.37 m	EL 162.50 m	Fresh rock was available at EL 164.00 m, dam foundation grade is kept 1.5m below than rock level.	
Top of the dam (Bridge deck level)	EL 232.50 m	EL 229.00m	EPC contractor had submitted free-board calculation and it is found that the 2m free-board above FRL is OK, accordingly dam top is proposed at EL 228.00m. However, 1m solid parapet wall is also proposed at dam top.	
Maximum height of dam	70.13 m	66.50 m	El. 229.00 m – El. 162.50 m = 66.50m	
Overflow spillway for debris removal size (W x H)	5.5 m x 2.0 m	4.0 m x 3.0 m	To reduce D/S left bank excavation and to fit the Overflow debris spillway within one block, width and height have been adjusted	
Sluice spillway No. & size (W x H)	8 No.s, 7.1 m x 8.65 m	6 No.s, 10 m x 12.50 m	The discharging capacity of proposed spillway arrangement is verified on the physical hydraulic model study carried out in IRI, Roorkee and gate opening was found	

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
			adequate to pass the PMF at N-1 condition. Same is approved by CEA	no impact envisaged.
Construction Sluice No. & size (W x H)	2 No.s, 5.5 m x 7.5 m	2 Nos. 5.0m X 5.0 m	Proposed construction sluice in tender design to avoid dewatering issue during construction.	
Non overflow length	Left – 97.55 m, Right – 91.80 m	Left - 111.40 m, Right – 110.00 m	As per revised arrangement of NOF and OF section.	No implication in EIA.
Total width of dam structure including overflow & non overflow blocks	345.05 m	335.00 m	Do	No implication in EIA.
Crest level of overflow spillway for debris removal	EL 224.00 m	EL 223.00 m	To maintain the same discharge capacity, the crest level of overflow spillway is lowered by 1m	No implication in EIA.
Crest level of sluice spillway	EL 181.00 m	EL 190.00 m	A flip bucket type of the energy dissipation arrangement was proposed in the tender layout, with raised crest level to meet TWL and the bucket lip elevation requirements. Same is approved by CEA	No implication in EIA.
Crest level of construction sluice spillway	EL 177.00 m	EL 171.0 m	N. A.	No impact.
Energy dissipation arrangement	Solid roller bucket type	Flip bucket type	A flip bucket type of the energy dissipation arrangement was proposed in the tender layout and same is found to be adequate	No implication in EIA.

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
			during hydraulic model study. Same is approved by CEA	
Plunge Pool	No	Yes		No additional impact.
Sluice spillway capacity	11,030 m <sup>3</sup> /s	No change		No impact.
Gate type & Number	Radial gate & 8 No. with hydraulic hoist	Radial gate & 6 No. with hydraulic hoist	The discharging capacity of proposed spillway arrangement is verified on the physical hydraulic model study carried out in IRI, Roorkee and gate opening was found adequate to pass the PMF at N-1 condition. Same is approved by CEA	No implication in EIA.
Gate Size of Sluice Spillway (W x H)	7.1 m x 9.54 m	10.00 m x 12.50 m		
Gate Size of Construction Sluice Spillway (W x H)	5.5 m x 8.475 m	-	N. A	
Spillway stoplog gate No. & Size	1 Set, 7.1 m x 14.33 m	1 Set, 10.00 m x 16.426 m	Revised as per modified opening size	
<b>RIVER DIVERSION SCHEME</b>				
Diversion type	Coffer dams, Channel with construction sluices	Diversion Tunnel, Coffer dams.	Since plunge pool is envisaged downstream of flip bucket spillway, it is a general practice to use diversion tunnel as a temporary river diversion arrangement. By doing so, dam construction can be done in one phase unlike two phase constructions in earlier	No additional implication on environment

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
			proposal. Same is approved by CEA	
<b>Upstream Cofferdam</b>				
Type	Plum Concrete	No change		No impact.
Height	18.00 m	21.5m	As per modified arrangement	No additional implication on environment
Top Length	160.10 m	179.5m		
Top Level	EL. 188.20 m	EL. 193.0 m		
<b>Downstream Cofferdam</b>				
Type	Earth & Rockfill	No change		No impact.
Height	13.00 m	10.0 m	As per modified arrangement	No additional implication on environment
Top Length	126.30 m	132.0 m		
Top Level	EL.186.00 m	EL.181.0 m		
<b>Diversions Channel</b>				
Diversions Channel (Size and Length)	Channel of 11m (W) X 11m (H),	Tunnel 10.5m dia		No additional implication on environment
Channel Length	U/s- 98.2m, D/s 59.265m	409 m long.		
No of Gates in the diversion Channel / Tunnel	-	2 nos (4.5m x 10.5 m)		
<b>INTAKE – MAIN POWERHOUSE</b>				
Number of openings	1	No change		No impact.
Invert sill level	EL 186 m	EL 189.50 m	To address changes of the Dam spillway elevations and change of the energy dissipation type (resulting in 9m raise of the Spillway crest elevation), the Trashrack invert elevation is also raised by 9m and correspondingly sill level of intake at start of HRT is raised by 3.5m. Same is approved by CEA	No implication on EIA.
Intake top level	EL 232.50 m	EL 229.0 m	The top of intake is kept same as top of dam	No implication in EIA.

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
Nominal discharge	112.71 m <sup>3</sup> /s	No change		No impact.
Intake gate		No change	Do	No implication in EIA.
- Number	2 vertical fixed wheel gates, one emergency – and other service gate			
- Hoist type	Independent rope drum hoists			
- Gate sill level	EL 186.0 m			
- Gate operating platform level	EL 232.50 m			
<b>INTAKE – AUXILIARY POWERHOUSE</b>				
Number of openings	1	No change		No impact.
Invert sill level	EL 194.25 m	EL 195.00 m	The Trashrack invert elevation in power intake of auxiliary PH & main PH is kept same. Invert sill of intake and trashrack invert is also kept at same level and accordingly raised by 0.5m. Same is approved by CEA. The top of intake is kept same as top of dam.	No implication in EIA.
Intake top level	EL 232.50 m	EL 229.0 m		
Nominal discharge	24.94 m <sup>3</sup> /s	No change		
Intake gate		No change		
- Number	2 vertical fixed wheel gates, one emergency – and other service gate			
- Hoist type	Independent rope drum hoists for emergency gate and hydraulic hoist for service gate			
- Gate sill level	EL 194.25 m	EL 195.00 m		
- Gate operating platform level	EL 232.50 m	EL 229.0m		
<b>HEAD RACE TUNNEL</b>				
Location	Right bank of Kopili river	No change		No impact.
Excavated shape	Modified Horseshoe	No change		No impact.
Finished shape	Modified Horseshoe	Circular	Shape is changed to take care the effect of low rock cover. Same is approved by CEA	Change in head race design will result in increase in the volume of muck generated for disposal on-site. Which will be covered under EMP.
Length	3,619.62 m	3641.22 m	As per revised arrangement.	
Finished diameter	6.65 m	7.00 m	Diameter of HRT is increased to ensure CEA approved head losses of 6m.	

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
Nominal discharge	112.71 m <sup>3</sup> /s	No change		
Flow velocity	3.13 m/s	2.93 m/s	As per revised diameter of HRT	
Slope	Chainage 62.58 to 2,241.48 m Slope 1 in 88.76, From Chainage 2,241.48 m to 3,682.20 m Slope 1 in 110.17	Chainage 72.58 3704.80 m Slope 1 in 74.89	As per revised arrangement.	
<b>ADIT-1 TO HRT</b>				
Shape & Size	D-Shape, 6.0 m	No change		No impact.
Length	334.22 m	354.66 m	As per revised arrangement.	Change in head race design will result in increase in the volume of muck generated for disposal on-site. Which will be covered under EMP.
Type & Number of Gate	Hinge type, One	No change		No impact.
Gate Size (W x H)	2.5 m x 2.5 m	No change		No impact.
<b>ADIT-2 TO HRT AND SURGE SHAFT</b>				
		Deleted	Top horizontal part of pressure shaft is proposed to be used as a construction adit in revised arrangement. Therefore, additional adit is no more required and hence deleted. Same is approved by CEA	Removal of adits was determined following techno-economical studies considering costs, construction time, complexity, and associated risks. Surface Valve House with part underground
Shape & Size	D-Shape, 6.0 m			Pressure Shaft and part surface Penstock was optimum solution for the given topographical conditions. Reduction in muck for disposal, no
Length	153.35 m			
<b>ADIT-3 TO VALVE HOUSE</b>				
		Deleted	Since surface valve house is proposed instead of underground valve house. The adit is no more required and deleted. Same is approved by CEA	

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
Shape & Size	D-Shape, 7.0 m			tunnel blasting or excavation required.  No environment impact.
Length	149.38 m			
<b>ADIT TO FERRULE (Ring) ERECTION CHAMBER</b>		Deleted	Top horizontal part of pressure shaft will be used for ferrule erection in revised arrangement. Therefore, additional adit is no more required and hence deleted. Same is approved by CEA	
Shape & Size	D-Shape, 7.0 m			
Length	162.57 m			
<b>SURGE SHAFT</b>				
Vertical Shaft	32.21 m	39.0 m		
Type	Restricted orifice type	No change		No impact.
Diameter	25 m	No change		No impact.
Max. upsurge level	EL. 235.33 m	EL. 235.0 m	As per updated transient studies considering revised dimension of HRT and penstock. Same is approved by CEA	Change in surge shaft design will result in an alternation in the volume of muck generated for disposal on-site. Which will be covered under EMP.
Min. down surge level	El. 188.81m	El. 188.0 m		
Top elevation	EL. 237.50 m	No change		
Bottom elevation	EL. 149.40 m	EL. 147.0 m		
Total height of Surge Shaft	82.90 m	90.5 m	El. 237.50m – El. 187.50m = 50.00m. The surge shaft of 25m diameter is connected with HRT via 7m diameter riser shaft	
Diameter of Orifice	3.80 m	No change		
Riser Size, height	3.6m $\phi$ , 32.21 m	7.0 m, 39.0 m	Diameter of riser shaft is revised to contain the velocity within acceptable velocity in concrete lined shaft unlike steel lined shaft in earlier proposal.	

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
			Same is approved by CEA	
<b>VALVE HOUSE</b>				
Type & Number	Underground, 1	Surface, 1	The vertical cover of DPR proposed valve house appeared to be low (<2D) and further it needed to be excavated through multiple drifting by controlled blasting. Same is approved by CEA	Change in design alters consumption of construction materials (e.g., concrete) and the volume of muck generated for disposal on-site. Which will be covered under EMP.
Size (L x W x H)	19.9 m x 11.5 m x 17.25 m	14 m x 23 m x 27.50 m	As per revised arrangement.	
Butterfly valves - Number - Diameter	1.0 5.0 m	No change. 6.1 m	Diameter of Valve is increased to ensure CEA approved head losses of 6m. Same is approved by CEA	
<b>PRESSURE SHAFT/ Penstock Main Power House</b>				
Type	Circular steel lined	No change		No impact.
Nominal discharge	112.71 m <sup>3</sup> /s	No change		No impact.
Internal diameter of pressure shaft liner	5.2 m	6.1 m / 5.2 m	Diameter of pressure shaft is increased to ensure CEA approved head losses of 6m. Same is approved by CEA	Change in pressure shaft design alters consumption of construction materials (e.g., concrete) and the volume of muck generated for disposal on-site. Which will be covered under EMP.
Flow velocity	5.31 m/s	3.86 m/s / 5.31 m/s	As per revised diameter of Penstock	
Length of pressure shaft	703.80 m	610 m (Dia 6.1m) / 81.9m (Dia 5.2m)	As per revised arrangement.	
Number of pressure shaft	1	No change	No Change	
Specification of steel plates	ASTM A537 Class II (YS-415 Mpa)	No change	No Change	

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
Unit Penstock - Number - Internal diameter - Length	2 3.70 m 57.06 m/ 65.52 m	2 3.7 m 16.3 m	As per revised arrangement.	
<b>PRESSURE SHAFT – Auxiliary Power House</b>				
Type	Circular steel lined	No change		No impact.
Nominal discharge	24.94 m <sup>3</sup> /s	No change		No impact.
Internal diameter of pressure shaft liner	2.7 m	3.3 m	Diameter of penstock is increased to ensure CEA approved head losses of 1m. Same is approved by CEA	Change in pressure shaft design alters consumption of construction materials (e.g., concrete) and the volume of muck generated for disposal on-site. Which will be covered under EMP
Flow velocity	4.36 m/s	2.92 m/s	As per revised diameter of Penstock	No impact.
Length of pressure shaft	70 m	64 m	As per revised arrangement.	No impact.
Number of pressure shaft	1			
Specification of steel plates	E410 (Fe 540)	ASTM A537 Class II (YS-415 Mpa)	The proposed type of penstock material in main penstock is ASTM 537 and same is proposed for auxiliary penstock for ease of procurement. Same is approved by CEA	No impact.
Unit Penstock - Number - Internal diameter - Length	3 2 Nos.1.2 m & 1 No.1.7 m 30.79m/27.16 m/31.62 m	3 2 Nos.1.65 m & 1 No.2.35 m 26.20 m/ 26.20 m/ 24.20 m	Diameter of unit penstock is increased to ensure CEA approved head losses of 1m. Same is approved by	No impact on environment.

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
			CEA. As per revised arrangement.	
<b>POWER HOUSE – MAIN POWERHOUSE</b>				
Installed capacity	2x55 MW=110 MW	No change		No additional impact on environment envisaged.
Location	Right side of river Kopili	No change		
Type	Surface powerhouse	No change		
Powerhouse dimensions (L x W x H)	77.55 m x 21.5 m x 42.9 m	76.5 m x 19.1 m x 30 m	Powerhouse dimension is revised as per value engineering carried out during tender design.	
Average gross head	114 m	No change		
Type of turbines	Francis, vertical	No change		
Number of units	2	No change		
Turbine setting (elevation)	EL 98.80 m	No change		
Rated discharge per unit	56.35 m <sup>3</sup> /s	No change		
Installed capacity per unit	55 MW	No change		
Continuous overloading	10%	No change		
Spacing of Units	17.5 m	16.5 m	Spacing between two units is reduced as per value engineering carried out during tender design. Same is approved by CEA	
Rated Net Head	108.00 m	No change		
Normal T.W.L. (2 machines for Main PH & 3 machines for Auxiliary PH in operation)	EL 104 m	No change		
Minimum T.W.L. (1 machine in operation)	EL 102.8 m	EL 103.2 m	This TWL value corresponds to 1-unit full running condition unlike 50% running condition in earlier proposal. Same is approved by CEA	
Maximum T.W.L (during flood)	EL 111.66 m	EL 111.66 m	Rating curve is updated as per revised contour survey.	No impact
Turbine efficiency (Considered)	94.5 % (WAE)	94 % (WAE)	As per MOC	No impact

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
Generator efficiency (Considered)	98.5 %	98%	As per MOC	No impact
Draft Tube Gates - Type & Number - Size (W x H)	Fixed Wheel , 4 3.9 m x 4.4 m	Fixed Wheel , 4 3.9 m x 3.23 m	Opening size of draft tube is revised as per value engineering carried out during tender design. Same is approved by CEA	
Main Inlet Valve - Type - Axis elevation - Diameter	Butterfly type EL 98.80 m 3.0 m	No change		No impact.
Generator - Type & Number - Rated capacity - Synchronous speed - Voltage/Frequency - Power factor - Excitation	Vertical synchronous (2 nos) 55MW 230.77 rpm 11kV/ 50 Hz 0.85(lagging) Static excitation	No change 250 rpm	Speed of turbine is revised to obtain equal pair of poles. Same is approved by CEA	No impact.
<b>POWER HOUSE – AUXILIARY POWERHOUSE</b>				
Installed capacity	2x2.5 MW+1x5 MW=10 MW	No change		Change in size of surface infrastructure will marginally affect on land take because of construction. Change in powerhouse design alters consumption of construction materials (e.g., concrete) and the volume of muck generated for disposal on-site. Which will be covered under EMP.
Location	Right side of river Kopili	No change		
Type	Surface powerhouse	No change		
Powerhouse dimensions (L x W x H)	44.2 m x 11.5 m x 36.0 m	50.5 m x 10 m x 27 m	Powerhouse dimension is revised as per value engineering carried out during tender design.	
Average gross head	48.30 m	No change		
Type of turbines	Francis, horizontal	No change		
Number of units	3	No change		
Turbine setting (elevation)	EL 169.50 m/170.5 m	EL 170.5 m	As per revised TWL	
Rated discharge per unit	6.23 m <sup>3</sup> /s/ 12.47 m <sup>3</sup> /s	No change		
Installed capacity per unit	2.5 MW / 5 MW	No change		
Continuous overloading	10%	No change		
Spacing of Units	10 m /12 m	No change		
Rated Net Head	47.30 m	No change		
Normal T.W.L. (2 machines for Main PH & 3 machines for Auxiliary PH in operation)	EL 169.70 m	No change	Rating curve is updated as per revised contour survey.	
Minimum T.W.L. (1 machine in	EL 169.00 m	EL 160.16	Rating curve is	

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
operation)		m	updated as per revised contour survey.	
Maximum T.W.L (during flood)	EL 185.34 m	No change		No impact.
Turbine efficiency (Considered)	90 % (WAE)	No change		No impact.
Generator efficiency (Considered)	96 %	No change		No impact.
Draft Tube Gates - Type & Number Size (W x H)	Fixed Wheel , 3 1 Nos. 3.x1.8 m, 2 Nos. 2 x 1.8 m	No change		No impact.
Main Inlet Valve - Type - Axis elevation - Diameter	Butterfly type EL 168.00 m 1.65 m / 2.35m	-1.4 m/ 2.0 m	As per revised centre line of penstock	No impact.
Generator - Type & Number - Rated capacity - Synchronous speed - Voltage/Frequency - Power factor - Excitation	Horizontal synchronous (3 nos) 2.5MW/5MW 750 rpm 6.6kV/ 50 Hz 0.85 (lagging) Brushless excitation	500 rpm (2.5 MW) / 375 rpm (5MW)	Speed of turbine is revised as per value engineering carried out during tender design. Same is approved by CEA	
<b>TRANSFORMER YARD – Main Power House</b>				
Type	1 phase, OFWF cooled Generator Transformer	single phase, ONAN /ONAF	As per value engineering carried out during tender design.	No additional impact envisaged.
Location	Upstream of powerhouse	No change		
Number	7 (6+1 spare) nos.	No change		
Rated capacity	22.5 MVA	24 MVA	As per value engineering carried out during tender design.	
Voltage ratio	11/220/√3 kV	11/220/kV		
<b>TRANSFORMER YARD – Auxiliary Power House</b>				
Type	3 phase, ONAN/ ONAF cooled Generator Transformer	No change		
Location	Downstream of powerhouse	Upstream of powerhouse	As per value engineering carried out during tender design.	
Number	2 nos.	No change		No impact.
Rated capacity	6.5 MVA	No change		No impact.
Voltage ratio	6.6/33 kV	No change		No impact.

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
<b>TAIL RACE CHANNEL – Main Power House</b>				
Type	Rectangular	Rectangular	Arrangement is revised to provide better hydraulic condition at the outlet of tail race.	Change in tailrace channel design alters consumption of construction materials (e.g., concrete) and the volume of muck generated for disposal on-site. Which will be addressed as per EMP provisions.
Numbers	1	No change		
Size (L x W)	52 m x 26.3 m	40.0 m X 26.0 m	Do	
Slope	5H:1V	4H : 1V	Do	
Nominal discharge	112.71 m <sup>3</sup> /s			
Outlet sill elevation	102.0 m	102.0 m	Do	
<b>TAIL RACE CHANNEL– Auxiliary Power House</b>				
Type	Rectangular	Three separate ducts merging into one common Duct		Change in tailrace channel design alters consumption of construction materials (e.g., concrete) and the volume of muck generated for disposal on-site. Which will be addressed as per EMP provisions.
Numbers	1	[2 Nos of 2m (W) X 1.8m (H) and 1 No of 3m (W) X 1.8m (H)] – merging into (3+4) m (W) X 1.8m (H)	As per value engineering carried out during tender design.	
Size (L x W)	72.18 m x 5 m after junction		Do	
Slope	5H:1V		Do	
Nominal discharge	24.94 m <sup>3</sup> /s	No change		
Outlet sill elevation	168.50 m	167.50 m	Do	
<b>SWITCH YARD – Main Power House</b>				
Type & Size	Outdoor-152 m x 71 m	Outdoor-146 m x 72 m	As per value engineering carried out during tender design.	No impact.
Voltage level	220 kV	No change		
Scheme	Double bus with bus coupler	No change		
No. of outgoing feeders	4 (Four) nos.	No change		
<b>SWITCH YARD – Auxiliary Power House</b>				
Type & Size	Outdoor-19.3 m x 16 m	Outdoor-	As per value	

Component / Item	As per EIA	Present Adjustment /shifting	Justification	Impact on environment
		21 m x 24 m	engineering carried out during tender design.	
Voltage level	33 kV	No change		
Scheme	Single bus	No change		
No. of outgoing feeders	2 (Two) nos.	2 (Two) nos.		No impact.
<b>POWER BENEFITS – Main Power House</b>				
90% dependable energy with 95% plant availability	415.78 MU	No change		No impact.
<b>POWER BENEFITS – Auxiliary Power House</b>				
90% dependable energy with 95% plant availability	53.80 MU	No change		No impact.
<b>POWER BENEFITS (Total)</b>				
90% dependable energy with 95% plant availability (Total)	469.58 MU	No change		No impact.
<b>CONSTRUCTION PERIOD</b>				
Mobilisation and infrastructure development	9 Months	No change		No impact.
Main construction period	3 Years 3 Months	No change		No impact.
Total construction period (Mobilisation and Infrastructure Development )	4 Years	No change		No impact.

Annexure 14 Project Layout

