Environmental Monitoring Report

PUBLIC

Semestral Report: July 2023 – December 2023
December 2024

India: Assam Power Sector Investment Program - Tranche 3

Part 1 of 3: Main Report (Pages 1 – 166) and Annexure 1 - 2

Prepared by Assam Power Generation Corporation Limited (APGCL) for the Asian Development Bank (ADB).

Asian Development Bank

Environmental Monitoring Report

Project No. 47101-004
Semi-Annual Report
January 2024

SFG Log: 6404

India: Assam Power Sector Investment Program - Tranche 3

Prepared by the Assam Power Generation Corporation Limited (APGCL) for the Asian Development Bank.

Environmental Monitoring Report
(as of 31st December 2023)

Loan Number 4029-IND

Assam Power Sector Investment Program – Project-3

Reporting Period : from July, 2023 to December, 2023

Loan Signing Date : 30th December 2020

Prepared by the Assam Power Generation Corporation Limited (APGCL) for the Asian Development Bank

This environmental monitoring report is a document of the borrower and made publicly available in accordance with ADB's Access to Information Policy 2018 and the Safeguard Policy Statement 2009. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff.

LIST OF ABBREVIATIONS

ADB	Asian Development Bank
AEGCL	Assam Electricity Grid Corporation Limited
APDCL	Assam Power Distribution Company Limited
APGCL	Assam Power Generation Corporation Limited
CPCB	Central Pollution Control Board
CTE	Consent to Establish
CTO	Consent to Operate
DC	Double Circuit
EA	Project Executing Agency
EARF	Environmental Assessment and Review Framework
EIA	Environment Impact Assessment
EMP	Environment Management Plan
GOI	Government of India
IEE	Initial Environment Examination
MPH	Main Power House
PAM	Project Administration Manual
PCBA	Pollution Control Board of Assam
PMU	Project Management Unit
SPS	Safeguard Policy Statement
TL	Transmission Line

Glossary of Terms

Environmental Safeguards – means the principles and requirements set forth in Chapter V, Appendix 1 and Appendix 4 (as applicable) of the SPS.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

Project Name : Assam Power Sector Investment Program – Project-3

Executing Agency	Government of Assam acting through Assam Power Generation Corporation Limited (APGCL)
Implementing Agency	Assam Power Generation Corporation Limited (APGCL)
Environment Safeguards Categorization	A
Environment Safeguards Documentation	EARF - 2013, EIA - 2018, EMP - 2018 (Interim EIA addendum upto December 2023 with EMP was updated)
	EIA was also prepared and disclosed in the MoEF&CC, GOI website for the LKHEP in connection with the Environment Clearance for the project. Initially prepared in March 2017 and finally submitted to MoEF&CC in July 2019. On the basis of that Environment Clearance was accorded to the project vide letter No. J-12011/26/2012-IA-I dated 4th September, 2019. The disclosed EIA (June 2018) in the ADB's website was prepared on the base document of the EIA and EMP prepared by WAPCOS. As both the Ministry and ADB have different generic structure of environmental impact assessment both the reports were structurally different. But the basic assessment and information provided in the EIA report were the

	same. Additionally, as per ADB's requirement supplementary EIA were carried out in the year 2017 by ES Safeguards consultants. EIA addendum was updated with the current layouts and additional mitigation measures and submitted to ADB for disclosure. Detail downstream assessment is under process and updated results will be reported in the subsequent EMRs and EIA addendum by June 2024.
Project Stage	Construction
Detailed Design Required Post-Approval	Yes. As all contract packages are EPC mode of contract. Currently Package 1 – Building and Infrastructures works; Package 2 (Civil and Hydromechanical), Package 3 - Electro Mechanical and Package 4 – Transmission line were awarded.
Contract(s) Awarded	Yes. Package 1 – Building and Infrastructures works, Package 2 (Civil and Hydromechanical), Package 3 - Electro Mechanical & Package 4 – Transmission line awarded
Bidding Document(s) Include EMP Cleared by ADB	Yes. Bidding document of 1 – Building and Infrastructures works, Package 2 (Civil and Hydromechanical), Package 3 Electro mechanical works and Package 4 – Transmission line EMP includes relevant sections of the EMP and all were cleared by ADB.
Contract(s) Awarded Include EMP Cleared by ADB	Yes. Contract document of all the 4 packages included EMP which was cleared by ADB.
National Environment, Health and Safety Clearance(s) Obtained	All clearances/permits required for the project have been obtained like Environment Clearance, Forest Clearance Stage II, Ministry of Defense, Ministry of Home Affairs, Central Electric Authority, Ministry of Tribal Affairs, etc. During the detail engineering and execution of the project some minor design changes were necessitated without changing the power generation capacity of LKHEP. The Memorandum of Changes (MoC) for these design changes was approved by Central Electricity Authority (CEA) on 09.11.2022 after taking concurrence from the relevant departments of Govt. of India like Central Water Commission, Geological Survey of India, Central Soil and Material research Station etc. EC amendment on the changes due to detailed engineering design was accorded by MoEF&CC on 03.01.2024 Contractor of CP-1 has Labour license and permission for Ground water extraction. Contractor of CP-2 have the Labour License, Migrant labour license, CTO for Batching Plant (near Power House), CTO for Batching Plant (near Dam), CTO for Crusher, Clearances from PESO for establishment of Explosive Magazine, etc. Contractor of CP-3 has labour license, Migrant labour license and permission for Ground water extraction. Contractor of CP-4 has Labour License and Migrant labour license.

<table>
<tr><td>Contractor(s) Given Access to Site</td><td>Yes. Initially contractor given access on 20th November 2020 for package 2.
<table>
<tr><th>Date of handover</th><th>Description of the land</th></tr>
<tr><td>20th Nov'20</td><td>Approx. 37 Hectare revenue land -1 handed over to Contractor.</td></tr>
<tr><td>20th Nov'20</td><td>Approx. 63.2 Hectare revenue land -2 handed over to Contractor.</td></tr>
<tr><td>2nd Jan'21</td><td>Approx. 150 Hectare revenue land handed over to Contractor.</td></tr>
<tr><td>11th Jun'21</td><td>477.76 Hectare, diverted forest land handed over to Contractor.</td></tr>
<tr><td>03rd Jul'21</td><td>45.28 Hectare, diverted reserved forest land handed over to Contractor.</td></tr>
<tr><td>13th June'23</td><td>153 Hectare of land handed over to APGCL.</td></tr>
<tr><td>12th Dec'23</td><td>505 Hectare of land handed over to APGCL (Annexure 1)</td></tr>
<tr><td colspan="2">Total 1577 Ha land was handed over by the end of December 2023 which is 100 % of the total land. All the construction activities of Package 2, Package 3 and Package 1 will be concentrated within this area only.</td></tr>
</table></td></tr>
<tr><td>Construction Progress (%)</td><td>Physical & Financial Progress : Package wise
<table>
<tr><th>Sl.</th><th>Package Details</th><th>Physical Progress</th><th>Financial Progress</th></tr>
<tr><td>1</td><td>Building and Infrastructure (Pkg. 1)</td><td>34.03%</td><td>20.7%</td></tr>
<tr><td>2</td><td>Civil & Hydro Mechanical (Pkg. 2)</td><td>58.35%</td><td>45.8%</td></tr>
<tr><td>3</td><td>Electro Mechanical (Pkg. 3)</td><td>55.0%</td><td>16.8%</td></tr>
<tr><td>4</td><td>Transmission line (Pkg. 4)</td><td>69.0%</td><td>65.3%</td></tr>
</table></td></tr>
<tr><td>Unanticipated Impacts including Change of Scope or Design</td><td>As per Forest Advisory Committee's (MoEF&CC) suggestion the miscellaneous area and Muck disposal site has been shifted from Forest Land to Revenue Land.
Interim EIA addendum prepared as :-
there are some changes due to detail engineering approved by Central Electricity Authority as per Memorandum of Changes on 09.11.2022
As per FAC during Forest clearance suggested to shift the dumping area form Forest to Revenue land. EPC contractor of Package 2 selected 4 dumping ground in Revenue land.
Reservoir spread area 620 ha as per DPR and MOC and submergence area 552 Ha..</td></tr>
</table>

<table>
<tr><td></td><td>

Possibility of presence of pyrites in the excavated materials and the mitigation measures.
A section of Langka Umrangso road now National Highway and the bridge over Langku Nala falling within submergence area will be constructed by State PWD, etc.
GHG calculation was updated as per updated detail engineering design.

</td></tr>
<tr><td>Number of Site Inspections and Audits Undertaken by Environment Safeguards Staff in Reporting Period</td><td>12 nos of site inspection of all the components (Pkg.1, Pkg.2, Pkg.3, Pkg.4) were carried out. Day to day monitoring on EHS were carried out by site staffs of PMC and APGCL and reported to Environment Safeguard team of PMC and APGCL.
Joint Site inspections were carried out on 3rd, 20th July, 7th, 19th August, 9th, 29th September, 3rd, 19th October, 2nd, 16th November, 1st, 20th December, 2023.
Training was conducted by PMC and APGCL the contractor on EHS 07.12.2023. Training was also given by Contractor to their staff on EHS.</td></tr>
<tr><td>Corrective Action Required</td><td>Corrective actions as per site visits, ADB Aide Memoire for the ADB Mission 30th October to 4th November, 2023 and External Monitor's observation. All the corrective actions suggested by PMC, APGCL, External Monitor and ADB were not closed during the reporting period. Status of compliances are mentioned in Table 8</td></tr>
<tr><td>Outstanding Corrective Action this Reporting Period</td><td>Environment Safeguards – Outstanding Corrective Action Plan upto December, 2023 are mentioned in Table 8.</td></tr>
<tr><td>Non-Compliances Recorded this Reporting Period</td><td rowspan="2">Corrective actions mentioned in Table 8.</td></tr>
<tr><td>Corrective Action Required</td></tr>
<tr><td>Number of Health and Safety Incidents</td><td>COVID 19 incidents :
<table>
<tr><th>Month</th><th>COVID 19 +ve</th><th>Recovered</th></tr>
<tr><td>July to December 2023 Total</td><td>0</td><td>-</td></tr>
</table>
COVID vaccination status of the staff and workers- CP2.
<table>
<tr><th>Month</th><th>1st Dose</th><th>2nd Dose</th></tr>
<tr><td>July 2023</td><td>314</td><td>305</td></tr>
<tr><td>August 2023</td><td>396</td><td>348</td></tr>
<tr><td>September 2023</td><td>302</td><td>244</td></tr>
<tr><td>October 2023</td><td>491</td><td>375</td></tr>
<tr><td>November 2023</td><td>312</td><td>234</td></tr>
<tr><td>December 2023</td><td>305</td><td>246</td></tr>
<tr><td>Jan-June Total</td><td>2120</td><td>1752</td></tr>
</table>
Safety Statistics:</td></tr>
</table>

Month	Work force	LTI	Safety observation	Closed	Non-Work Related Incident	First Aid Cases	Near Miss Reports
CP-1							
Jul 2023	14	0	5	2	0	0	1
Aug 2023	45	0	3	2	0	1	0
Sept 2023	45	0	4	4	0	0	0
Oct 2023	45	0	5	4	0	0	0
Nov 2023	38	0	4	3	0	1	0
Dec 2023	35	0	5	3	0	2	0
Total		0	26	18	0	4	1
CP-2							
Jul 2023	894	0	223	223	1	5	10
Aug 2023	1037	0	276	250	0	3	0
Sept 2023	1076	0	250	230	0	2	1
Oct 2023	1014	0	255	255	0	6	1
Nov 2023	1107	0	325	325	0	2	3
Dec 2023	1288	0	248	248	0	6	3
Total		0	1577	1531	1	24	18
CP-3							
Jul 2023	54	0	3	3	0	1	0
Aug 2023	54	0	4	3	0	1	1
Sept 2023	41	0	4	4	0	1	1
Oct 2023	43	0	5	5	0	1	1
Nov 2023	47	0	6	6	0	2	2
Dec 2023	51	0	8	6	0	1	1
Total		0	30	27	0	7	6
CP-4							

	Jul 2023	20	0	3	2	0	0	0
	Aug 2023	48	0	4	3	0	0	1
	Sept 2023	36	0	4	0	0	3	1
	Oct 2023	36	0	6	4	0	2	1
	Nov 2023	30	0	5	4	0	2	1
	Dec 2023	48	0	14	13	0	0	1
	Total		0	36	26	0	7	5
	G. Total		0	1669	1602	1	42	30

Non Work Related Accident :	1 non-work-related accident occurred at Lanka 04.06.23. Note : Mr. Ananga Kumar Dey met an accident with a motorcycle while crossing road at Lanka with bicycle around 4.30 PM. On 08.07.23 fitness certificate was issued and he joined the work.

GRM Functional	Yes. Project GRM is a three-tier system approved by Government of Assam. Grievances were on land compensation issues. No grievances were on environment, Health and Safety. Contractors own GRM is also there to address contractor's staff and labour grievances.
Number of Unresolved Grievances from Prior Reporting Period	Nil related to environment Health and Safety.
Number of Grievances Received in Reporting Period	Nil related to environment Health and Safety.
Number of Grievances Resolved this Reporting Period	NA
Number of Grievances Still Outstanding	NA

Number of Grievances referred to Court of Law	Nil related to environment Health and Safety
Number of Grievances referred to the Accountability Mechanism	Nil related to environment Health and Safety

Note : Supplementary environmental assessment studies (CIA, WQRP, WRMP) carried out during project preparation are part of the June 2018 EIA as disclosed on the ADB website.

1.0 Introduction

1.1 Brief Project Description

Government of Assam is the Executing Agency for the Assam Power Sector Investment Program – Project-3 and acting through Assam Power Generation Corporation Limited (APGCL). The Assam Power Generation Corporation Limited and its Project Management Unit are wholly responsible for the implementation of ADB-financed projects, as agreed jointly between the borrower and ADB, and in accordance with the policies and procedures of the government and ADB. ADB staff is responsible for supporting implementation including compliance by Assam Power Generation Corporation Limited and its Project Management Unit of their obligations and responsibilities for project implementation in accordance with ADB's policies and procedures.

The objective of the project is to increase generation from clean energy sources in the State of Assam. The project shall comprise of the following :

Output 1 : Lower Kopili hydropower generation capacity expanded through the construction and commissioning of the 120 megawatt (MW) Lower Kopili Hydroelectric Project and its connection to the transmission grid. This comprises 2 units of 55 MW main powerhouse, 2 units of 2.5 MW and 1 unit of 5 MW auxiliary powerhouse.

Output 2 : Institutional capacity of APGCL strengthened. Through capacity building on construction, operations and maintenance and safeguards for 30 staff (including 6 women).

Output 3 : Resource Management and community resilience initiatives implemented. Through (i) installation of sensors and monitoring equipment. (ii) development of dashboards for state and local government agencies for resource management and (iii) development of plans and training for at least 500 people (including 40% women) along the Kopili River basin for increased capacity for managing disaster.

The Project's impact will be aligned with increased availability of electricity in Assam. The outcome of the project will be increased capacity of energy generation in Assam, where electricity generation will be increased by 469 gigawatt-hour/year (GWh/year). Greenhouse gas generation from electricity generation will decrease by 3,91,561 tCO2e / year from 2025 onwards.

The dam proposed to be built at Longku (Figure-1) will be a concrete gravity dam, of height 66.5 m and top longitudinal cross section 335 m. The crest of the dam will be 229 m above mean sea level (MSL). The dam will create a reservoir at Longku with a spread of 620 hectares (ha), with live storage of 77 million cubic meter. This is the current design and that this has changed since the 2018 EIA. An excavated tunnel will deliver the water from the reservoir to the main power plant. Water from the intake to the main power plant enters the tunnel of diameter 7.0 meter on the right bank of the Kopili river. This tunnel will be 3.64122 kilometer (km) long. At the end of this low-pressure tunnel, water will enter the pressure shaft. The pressure shaft will be circular of 6.1 / 5.2 m diameter (UG section, 610m + 81.9m). The pressure shaft will deliver water to two steel penstocks each of length of about 16.3 m, which in turn would convey water to the turbines. Water to the auxiliary power plant will be taken directly along a steel-lined circular pressure shaft of diameter 3.3 m and of length 64 m, and delivered to the turbine through three steel penstocks, each about 26.2m to 24.2m m long. The designed discharge capacity is 112.71 cubic meter per second (m/s), at a flow velocity of 3.86 m/s and 5.31 m/s.

The power evacuation system, an essential component of LKHEP, will be used to evacuate power it generates into the National / local grid. The power evacuation system will include the construction of a 220 kV Double Circuit (DC) transmission line (TL) from the Main Power House (MPH) site of LKHEP to an existing 132/33 kV Substation (S/S) at Sankardev Nagar (Lanka) and the construction of a 33 kV Single Circuit (SC) TL from the Auxiliary Power House (APH) site of LKHEP to an existing 132/33 kV S/S at Umrangsu. The length of TL between the MPH to Sankardev Nagar is 46.013 km (final alignment survey not completed yet), and between the APH to Umrangsu is 22 km. This is the current design and this has changed since the 2018 EIA. The TL corridors are envisaged to by-pass some villages / settlements and to avoid forests (Figure 3).

The power evacuation system will also involve upgrading of an existing 132/33 kV S/S at Sankardev Nagar with the existing 2 power transformers of capacity 2x25 MVA to 220kV with 2 inter-connected transformers (ICT) of capacity 2 x 160 MVA. The relevant switchgear proposed type is a Gas Insulated Substation (GIS). There is no land acquisition associated with the transmission system activity, and no potential impacts on biodiversity are anticipated.

The Lower Kopili HEP (subproject) is classified as Environment Category A, Involuntary Resettlement (IR) Category A, and Indigenous Peoples (IP) Category A ("triple A") in accordance with ADB's Safeguard Policy Statement (SPS 2009). Additionally, based on the results of the climate change risk assessment, the subproject is High Risk for Multi-Hazard Index and Climate. To fulfill national regulatory requirements and ADB's SPS 2009, APGCL prepared an Environmental Impact Assessment (EIA) with environment clearance obtained from the Ministry of Environment, Forest and Climate Change of Government of India.

There is a change in layout since the EIA during the Forest Clearance process as per Forest Advisory Committee (FAC), MoEF&CC. The Figure 2 has been prepared as per the updated layout map as on 30.06.2023 after the recent drone LiDAR survey in the month of April, 2023. The area of the Reservoir spread is 620 Ha as it was assessed during DPR and the same was approved by CEA. As transmission line is on the Revenue Land there is a change in the alignment and the length is reduced from 52 km to 46.013 km Figure 3. Correspondingly number of towers also reduced from 187 to 153.

The comprehensive environmental management plan (EMP) includes plans and programs for physical and biological mitigation for aquatic habitat, terrestrial fauna and flora, and hydrological impacts both upstream and downstream of the subproject as well as prescribes quality monitoring activities. As required by ADB's SPS 2009 and the Access to Information Policy 2018, draft EIA was disclosed in April 2018. As per GOI requirements EIA was also approved by MoEF&CC and the EIA was disclosed in the Pollution Control Board of Assam site (http://pcbassam.org/EIAREPORT/EIA%20Report_APGCL/Draft%20EIA%20Report%20Lower%20%20 Kopli.pdf). Summary EIA in English, Hindi and Assamese was disclosed in web site (https://ercindia.org.in/archive.ercindia.org.in/index.php/public-hearings-main?start=22). June 2018 EIA disclosed in the ADB site was uploaded in the APGCL web site (https://old.apgcl.org/EIA.pdf; https://old.apgcl.org/EIA%20annexures.pdf ; https://old.apgcl.org/EIA%20Transmission%20line.pdf) with all the supplementary EIA studies. Environment Clearance was accorded for the project on 4th September, 2019. Application for the amendment of the EC submitted to PARIVESH Portal 2.0 on 4th September, 2023 on the changes made so far due to detail engineering design for approval. Expert appraisal committee meeting of MoEF&CC was held on 26.10.23 and the committee recommended the changes in the minutes dated 14.11.2024. EC amendment letter awaited from MoEF&CC. As the project requires diversion of forest land stage 1 and stage 2 Forest Clearance was also accorded for the project on 5th February, 2019 and 4th December, 2020 respectively by MoEF&CC. APGCL will adhere to the EIA/EMP and will be responsible for timely implementation to ensure that all activities are in compliance with the applicable national and local policy, legal and administrative framework as well as ADB's SPS 2009.

Figure 1: Project Location Map

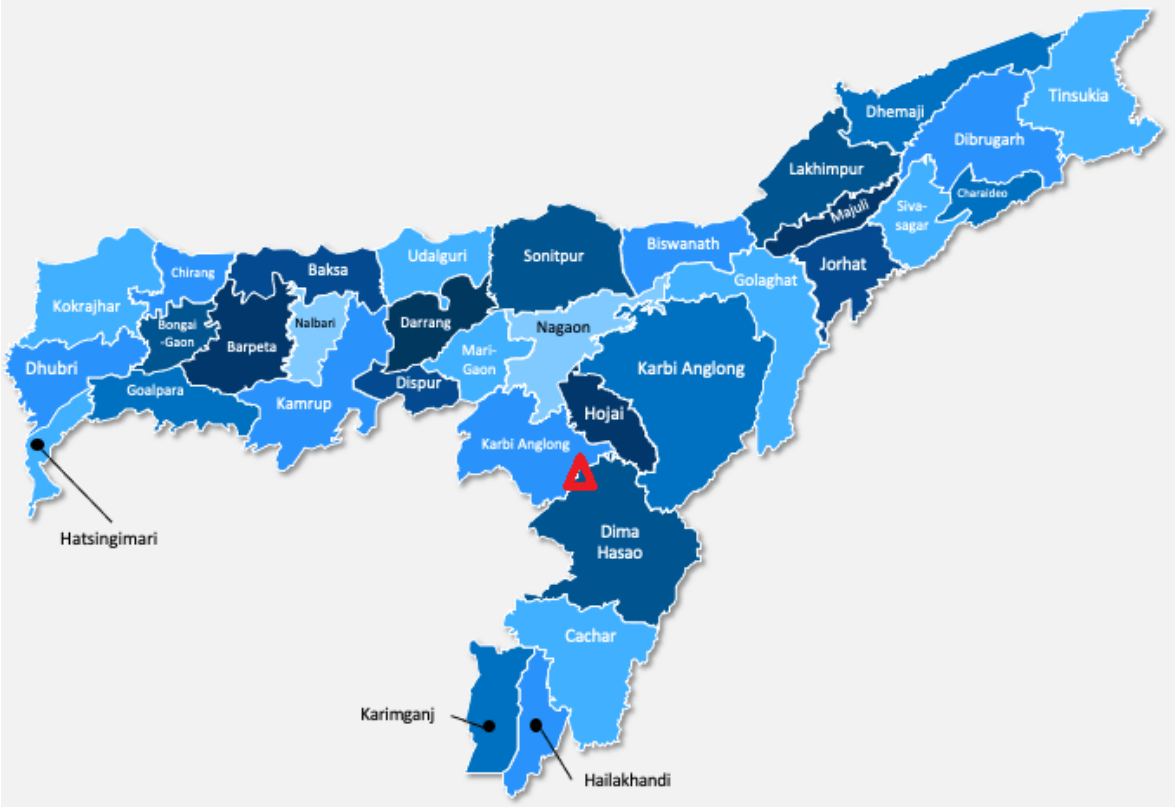


Figure -2 : Detail Layout Plan

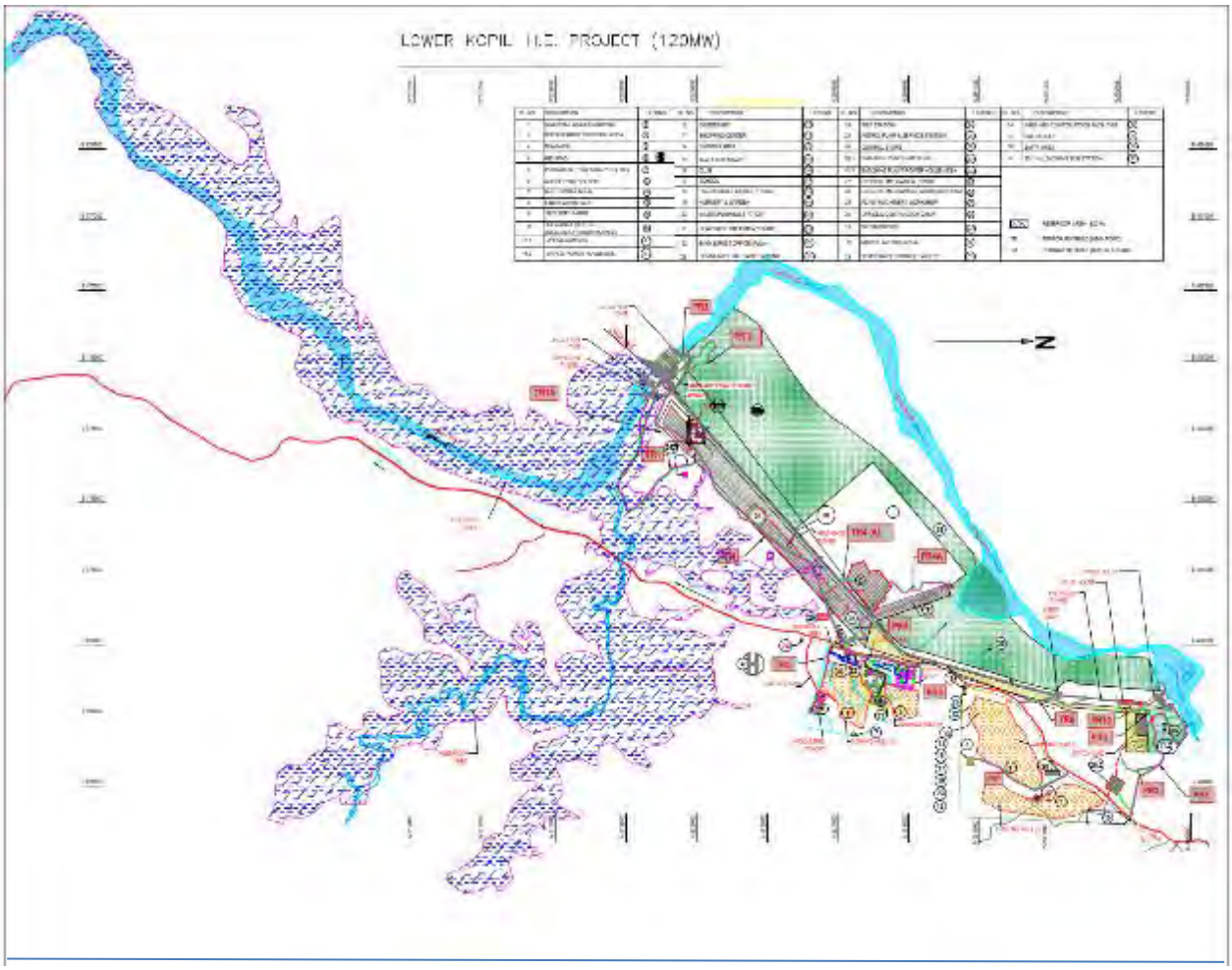


Figure 3 : Layout of Transmission line (Google earth)

Figure 4: Layout of Transmission line (Toposheet)

A grievance redress mechanism (GRM) is established to deal with complaints on environmental and social issues is also in place and its mandate is to resolve the grievances

in a timely manner and the approved GRM was adequately publicized amongst the affected peoples.

Organogram of environmental safeguards staffing and relationships between executing and implementing agencies, consultants, contractors, subcontractors (Figure 5). Contact details of Environment Safeguard team is given in the table 1.

Figure 5 : Organogram of environmental safeguards staffing

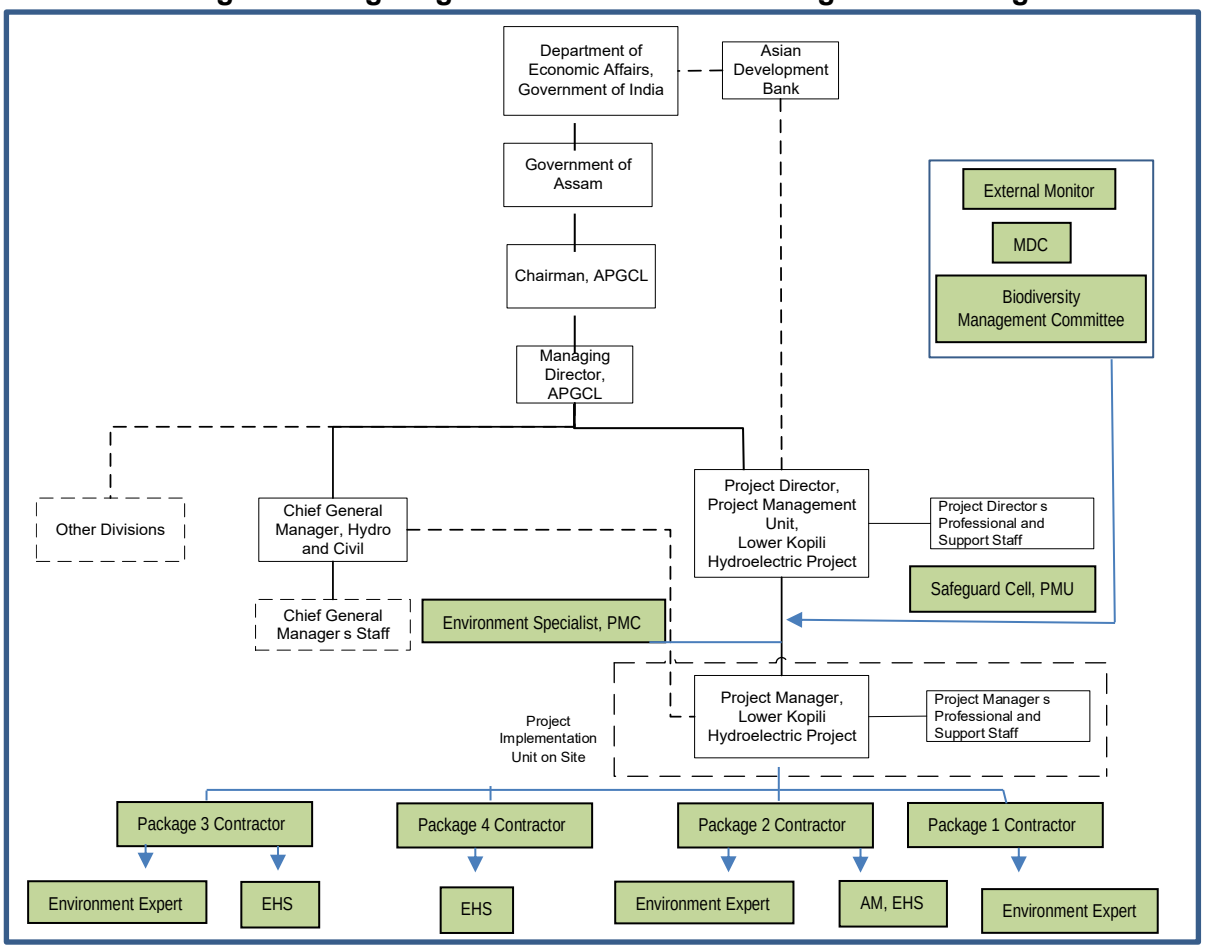


Table 1: Contact Details of the Environment Team under Project Director.

	Name	Contact no	Email Address
PMU, EE	Dr Deepak Kumar Baruah	9435113521	deepakbaruah007@gmail.com
PIU, EHS	Mr. Dhiraj Borthakur	9435526416	
PMC	Dr Jayanta Das	9435406966	jayanta.das@afry.com
PMC	Dr.Chandan Singh Negi	8126900166	chandansinghnegi80@gmail.com
Contractor Package 1	Mr. Phatik Saikia Environment Officer	8876854914	
Contractor Package 2	Mr. Tushar Gangopadhay EHS, Head	9332901606	Tushar-g@lntecc.com
	Mr Manoj Yadav Environment Engineer L&T	7838013312	manojyadav@lntecc.com
	Mr. Naba Jyoti Bera Assistant Manager EHS L&T	7099002556	nabajyotibera@lntecc.com
Contractor Package 3	Mr Mohit Mittal. Head HSE	8860085825	mohit.mittal@andritz.com
	Mr. R Ramkumar, HSE Manager at site	9384549075	
	Mr. Rohit (HSO)	8600439636	
Contractor Package 4	Mr. Himangshu Srivastava Health and Safety Expert	7051248211	
	Mr. S. Das, Environment Officer	9101939541	

(Note : For this reporting period site visits by external monitor were done in July, September, November, December, 2023).

Field level supervision are carried out by the Environment Engineer, EHS Manager and Assistant Manager EHS of the contractor and they prepare monthly Environment Report and Monthly Safety Reports and submit it to APGCL. PMC environment specialist visit the sites and prepare field reports and corrective actions to be complied. PMC also carry out joint visit with APGCL environment expert, APGCL EHS Officer and monitor the compliances. Monthly reports submitted by the contractor and field information received from the PMC staff and APGCL staff on the EHS issues are regularly reviewed and necessary actions are being suggested for the compliance and proper implementation of EMP. Trainings are also given on the implementation of EMP, EHS issues, Test of ambient environment for the contractor personal as well as APGCL and PMC staff.

Contractor carry out EHS inspection by EHS Engineer and supervision one per week; EHS inspection by Project EHS 2 per month and Executive EHS inspection 1 per month.

1.2 Project Progress Status and Implementation Schedule

Project progress status are shown in table 2. Overall physical progress 48.2%.

Table 2 : Project Progress status

Project Component/Stage	Awarded on	Target Completion Date	Progress Status	Physical Progress	Remarks
• Contract Package 1 (Buildings)	• NOA 24th August, 2022 • Contract signed 30th Sept, 2022 • Start date 1st Nov, 2022	• 30th April, 2024	Ongoing	34.03%	EMP provisions included in the Tender Document. Copy of labour license and insurance are obtained by the contractor.
• Contract award (Package 2) (Civil and Hydromechanical) (Construction phase)	• 5.8.2020 • Start Date 1st Sept, 2020	• 31st December 2023 (as per Loan agreement) • 30th June 2024 (as per PAM) • 31st August 2024 (as per Contract agreement with Contractor) • 30th April 2024 as per Best effort schedule	Ongoing	58.35%	Contract awarded to L&T contractor, Relevant section of the EMP included in the contract Labour license and insurance covered 1000 workers.
• Contract Package 3 (Electro Mechanical)	• NOA 9th Nov, 2021 • Signing of contract - 2nd November, 2021. • Awarded 9th Sept, 2021 • Commencement date : 12th November 2021.	• 13th March, 2025	Ongoing	55.0%	Contract awarded to M/s Andritz Hydro Private Limited contractor, Relevant section of the EMP included in the contract. Copy of the labour license and insurance submitted.
• Contract Package 4 (Transmission Line)	• NOA-20.04.2022 • Contract signed 27.05.2022 • Award: 30.06.2022 • Start date 1st June 2022	31st May, 2024	Ongoing	69.0%	EMP provisions included in the Tender Document. M/S. Salasar Techno Engineering Limited JV with M/s. Akelik Group OJCS

Project Component/Stage	Awarded on	Target Completion Date	Progress Status	Physical Progress	Remarks
					Insurance submitted by the contractor but Labour License submitted by the contractor.
• ERP Packages (Package no 6)	Start date 1st June 2019	30th June 2024		72.0%	Lot 4, NOA issues on 27th Dec, 2022
• Resources and Community Resilience (under JFPR)	NOA, Contract award date, Start date 28.10.2022	30th June 2024	ongoing	69.6	Inception report submitted on 28th December 2022. Output 1 Report and QPR 4 submitted.

ERP - Enterprise resource planning

During July 2023 to December 2023 there was no change in the scope of the works, location and alignment of the components, construction method and implementation schedule.

There was no change in the environmental safeguards staffing during the reporting period. After resignation Environment Officer of Package 4 is vacant since June 2023 to 22nd December 2023.

No unanticipated impacts and updates to EIA/EMP that were required during the reporting period.

1.3. Contractor's Resource Mobilization :

A. Staff and Worker

Table : 3 – Worker's and staff strength

	CP-1		CP-2		CP-3		CP-4	
Month	Number of workers	Number of staff	Number of workers	Number of staff	Number of workers	Number of staff	Number of workers	Number of staff
Jul'23	14	9	894	107	54	9	20	14
Aug'23	45	9	1037	110	54	11	48	11
Sept'23	45	9	1076	107	41	10	36	16
Oct'23	45	9	1014	110	43	9	36	16
Nov'23	38	9	1107	113	47	12	30	13
Dec'23	35	9	1288	110	51	19	48	15

B. Contractor's Equipment available at Project Site:

CP-2 – List of Equipment

L&T Construction

Engineering, Procurement, Construction and Commissioning of Project Roads, Civil & Hydro - Mechanical works for 120 MW - Lower Kopili Hydroelectric Project, Assam (Package-2)

Reporting Date			31-Dec-23
Equipment/ Plant & Machinery Available at Site			
S.No	**Type of Equipment**	**Capacity**	**Available at Site (Nos.)**
1	Diesel Generator	15 kVa	2
		40 kVa	1
		125 kVa	1
		180 kVa	1
		250 kVa	1
		500 kVa	3
		1000 kVa	1
2	Survey Equipments	Total Station	2
		Tunnel Profiler	3
		Auto Level	2
3	Excavator	13T-14T Capacity	4
		20T-30T Capacity	5
		45 T Capacity	3
4	Rock Breaker Attachment	20T capacity	2
5	Dumpers	14 cum capacity	10
		12 cum capacity	6
		10 cum capacity	3
		7 cum capacity	1
6	Dozer	Crawler Dozer - 230 HP	1
7	Hydraulic Drill Jumbo	2 Boom	1
8	Shotcrete Machine	Truck mounted Robo arm	4
		Portable Shotcrete Machine	1
9	Concrete Boom Placer	36m	1
		42m	1
10	Batching Plant	120 cum / hr	2
11	Rock Crawler Machine	ROC 203	4
		ROC T-25	4
		D35	1
12	Loader	1.7 - 2 cum Bucket Capacity	5
		Backhoe Loader JCB 3DX - 1 cum / 0.25 cum	1
13	Transit Mixer	6 cum capacity	4
		7 cum capacity	21
14	Air Compressors	Electric-500 cfm	1
		Diesel-650 cfm	4
		Electric - 608 cfm	3
		Diesel - 1000 cfm	1
		Diesal - 600 cfm	1
15	Cement Grout Pump	Hany Make Grout Pump-125 LPM	2
		150 LPM	2
16	Telehendler	11 Mtr.	2

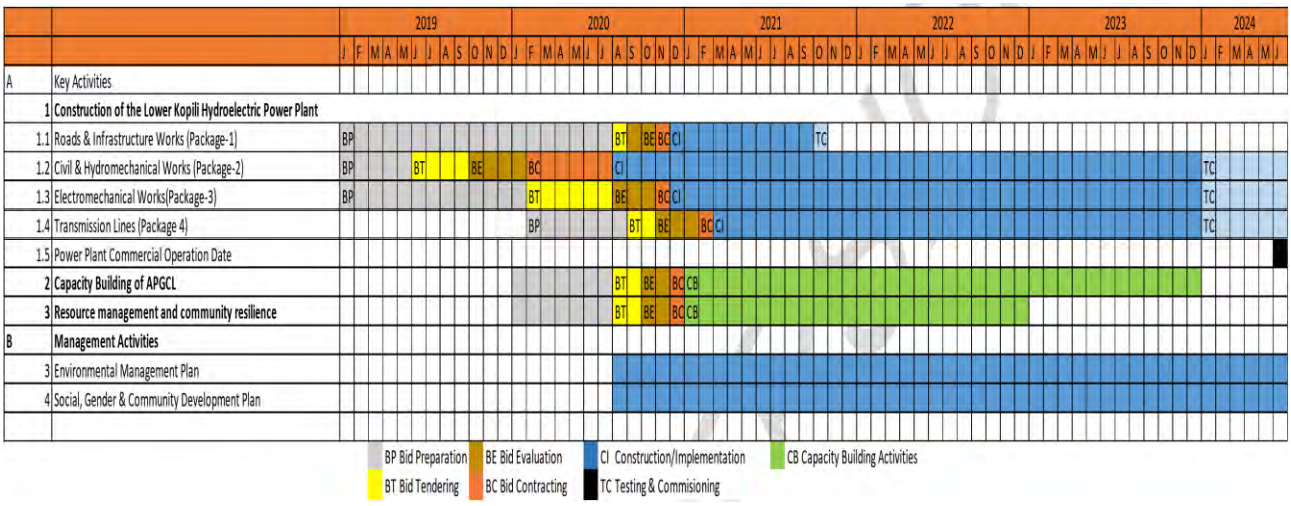
17	WMM Plant	WMM Plant - 200 TPH	1
18	Water Tanker	10 KL	1
19	Diesel tanker	5 KL	1
		9 KL	1
		6 KL	1
20	Crane	60 T	1
		15 T	2
		23 T	1
		3.2 T at 70 m	2
21	Crawler Mounted Crane	75 T	1
22	Gantry Crane for Surge Shaft	25 T	1
23	Truck Mounted Crane	15 T	1
24	Welding Machines	Electrical	54
25	Crusher	Primary - 200 TPH	1
		Teritery - 200 TPH	1
		Secondary - 200 TPH	1
		Secondary Secondary 300 TPH	1
		Wet Classifier	1
26	Weigh Bridge	80 T	1
		50 T	1
27	Dewatering Pump	60 HP	2
		30 HP	4
		72 HP	3
28	Bar Bending machine	32mm	2
29	Bar Cutting Machine	32mm	2
30	Cement Feeding Pump	30 TPH	2
		20 TPH	1
		25 TPH	4
31	Putzmeister Concrete Pump	60 m3/hr	2
	Schwing Stetter	72 m3/hr	1
	SANY	60 m3/hr	2
32	Truck	10 T	1
		5.4 T	1
33	Semi Low Bed Trailer	40 Ft.	1
34	Motor Grader	150 HP	1
35	Ice Plant	60 TPD	2
36	Water Chilling Plant	123 TR	2
37	Micro Silica Feeding Pump	4 TPH	2
38	Portable Mixer Machine	0.2 Cum	3
39	Aggregate Feeding System	300TPH	2
40	Fuel Dispenser Unit	55-65 LP	2
41	Diesel Light Mast	3kw - 2mtr	2
42	Ventilation Fan	55 KW	3
		132 KW	1
43	Explosive Van	1.1 T	1
44	Ambulance	-	3
45	Telebelt	Putzmeizer TB130- 240 cum/hr	1
46	Concrete Placer	MCP-56, 25 cum/hr	1
47	Wheel Mounted Fog Cannon	Water flow rate- 22 liters per min	3
48	Schwing Stetter- Loop Belt	3.42 cum/min	1

CP-1 : Equipment list

No.	Equipment Type and Characteristics	Quantity
1	Excavator/ JCB 3 DX	2
2	Water tankers	1
3	Dump trucks, 8 to 10 t	2
4	Mixer Machine	5
5	Soil Compactor	2
6	Tractor with trolley	1
7	Needle vibrator 60/40/25 mm with Frequency changer	6
8	Bar bending and cutting machine	6

1.4. Implementation schedule is shown in the figure 6.

Figure 6 Implementation schedule



(As per PAM)

2.0 Compliance to National Regulations and International Agreements

This section describes only the compliances of the national regulatory requirements.

Status of international agreement compliance are given below.

Table 3.1: International Treaties and Agreement Signed and Ratified by India

S. No.	International Agreements and Commitments	Applicability	Date of Signing / Ratifying	Status of Compliance
	Nature Conservation			
1	Convention on International Trade in Endangered Species of Fauna and Flora (CITES)	Yes	Signed by India in 1976	Being Complied
2	The Wildlife Trade Monitoring Network (TRAFFIC)	Yes	-	
3	Convention on Migratory Species (CMS)	Yes	-	
4	Coalition Against Wildlife Trafficking (CAWT)	Yes	-	
5	Convention on Biological Diversity (CBD)		Ratified February 1994 and September 2003 by Protocol.	
6	International Tropical Timber Organization (ITTO)	Yes	-	
7	United Nations Forum on Forests (UNFF)	Yes	-	
8	International conventions such as the International Union for Conservation of Nature and Natural Resources (IUCN)	Yes	-	
	Hazardous Material			
9	Strategic Approach to International Chemicals Management (SAICM)	Yes	-	Being Complied
10	Basel Convention on the Control of Trans- boundary Movement of Hazardous Waste and Their Disposal	Yes	Adopted on 22 March 1989	
11	Rotterdam Convention on Prior Informed Consent (PIC) for certain Hazardous Chemicals and Pesticides in International Trade	Yes	Adopted in 1998	
	Atmospheric Emissions			
12	United Nations Framework Convention on Climate Change (UNFCCC)	Yes		Being Complied
13	Kyoto Protocol	Yes	Signed by India in August 2002 and ratified in February 2005.	
14	Paris Agreement	Yes	Ratified by India on 2 October 2016. The agreement entered into force on 4 November 2016.	
15	Montreal Protocol (on Ozone Depleting Substances)	Yes	India signed on 17-9- 1992 and also ratified on 3rd March, 2003	

Source: MoEF&CC, India.

Status of the statutory clearances are shown in the table 3.2.

Table 3.2 : Statutory Clearances

Sl. No	Activities for which clearances are required	Statutory Requirement under the Act	Statutory Authority	Compliance Status as on 31st December 2023	Remarks
1	Environment Clearance	Environment Protection Act 1986	MoEF&CC, GOI	a. Accorded. b. EA to expedite the process of amendment of Environment Clearance (EC) to reflect the modifications in Project components as per MOC dated 9.11.22.	a. EC No. J-12011/26/2012-IA-I dated 04th September, 2019 b. Representative of MoEF&CC visited the site in March 2023 and submitted the site inspection report to Ministry in April 2023. c. EC compliance report submitted for December 2022 to May, 2023. d. EC amendment application submitted on 4.09.24. EAC meeting held on 26.10.24 and minutes dated 11.11.24. Annexure 2 : Copy of the minutes of EAC.
2	Forest Clearance	Forest Conservation Act, 1980	MoEF&CC, GOI	Accorded	• Stage 1 F.No.8-53/2018-FC dated 5th February, 2019 • Stage 2 File No. 8-53/2018FC dated 4th December, 2020 FC Compliance report submitted for April 2022 to March, 2023.
3	Consent to Establish (CTE) for Hydro Power Plant.		PCBA	PCBA accorded CTE on 28.2.23 vide No. WB/SLC/T-1267/22-23/7.	
4	Quarry				
A	Permission of the State Government for extraction of boulders from quarry. Location: Longku, Dima Hasao	1.NOC from North Sachar Hills Autonomous Council commencement Concession Rules, 2013	Stage-1. North Cachar hills Autonomous Council	Approval to operate quarry received from NCHAC on 8th July, 2022.	

		2. Mining Plan approval from department of geology and mining, Assam. Assam Minor Minerals commencement Concession Rules, 2013	Stage-2. Department of geology and mining, govt. of Assam	Mining Plan Approval received on dtd. 11th May'22 vide reference no: 31:33GM/MM/86-B (40)/Pt. VI/667-73.D31	
		3. Approval from Divisional Forest Officer, Haflong	DFO, Dima Hasao West, Halflong	DFO gave order to RO to realize Royalty from Hi-Tech Rock Products and Aggregates Limited for 3,36,000 cum on 11th July, 2022..	
		4. EC for quarry	SEIAA, Assam	EC accorded on 28.03.23.	
	Note: FC clearance not required for quarry at Kala Nala and other quarry site. Forest Department has accorded permission for deposition of Forest Royalty and given permission for extraction. Separate EC required before extraction.				
B	Permission for crushing of boulders from excavated materials	1. Permission for crushing 80,000 cum of boulders from excavated materials	DFO, Dima Hasao West, Halflong	Permission received from DFO, Dima Hasao West, Halflong on 20th Dec'21 vide letter no . refer letter no: FRS/G/101(a) Stone-Chips/L&T/2020-21/Pt-IV/2853-56	
		2. Permission for crushing 2,00,000 cum of boulders from excavated materials	DFO, Dima Hasao West, Halflong	Permission received from Principal Secretary (N), NCHAC on 8th Mar'22 vide letter No. letter no: FRS/Sectt/SP/155/2010-21/L/2/278	
		1. Royalty submitted	DFO, Dima Hasao West, Halflong	Dec'21- 500000 Jan'22-4750000 Feb'22-12500000 Mar'22-27250000 Oct'22-2500000	

				Feb'23-2450000 Mar'23-7000000 Total=56950000	
C	Permission of the State Government for extraction of Fine aggregate from quarry. Location: Up Stream and Downstream of Dam, Dima Hasao. (2 quarries)	1.NOC from North Sachar Hills Autonomous Council 2. Mining Plan approval from department of geology and mining, Assam. Assam Minor Minerals commencement Concession Rules, 2013	Stage-1. North Cachar hills Autonomous Council Stage-2. Department of geology and mining, govt. of Assam	Sand requirement will be met by the crushed sand.	
5	Batching Plant (Near Power House)				
A	Permission of Village Panchayats (Gaon burah) for installation of batching plant. Location: Totelangso, Dima Hasao	Permission from Village Panchayats.	Applied to Village Panchayats for installation of Crushers on 30-06-2021	Approval Received on 30.06.2021	NOC Received from Village Panchayats for setting up Batching Plant near Totelangso, Dima Hasao.
B	Permission of the State Government	NOC from North Cachar Hills Autonomous Council	North Cachar Hills Autonomous Council	NOC received from NC Hills Autonomous Council vide letter no. FRS.Sectt./S. Crusher/45/2018-19-20/L/2 dated 19th Oct, 2021.	
C	Clearance of Pollution Control Board for setting up Batching Plant. Consent to Establish – (CTE) Location: Powerhouse, Totelangso,Dima Hasao	CTE from State Pollution Control Board, Assam	Pollution control board, Assam for installation of Batching Plant.	CTE obtained from PCBA vide Ref. No. WB/SLC/T-1191/21-22/7/1076 dated 11th November, 2021	
D	Clearance of Pollution Control Board for setting up Batching Plant. Consent to Operate – (CTO)	CTO from State Pollution Control Board, Assam	State Pollution Control Board, Assam	CTO Received vide order No. WB/SLC/T-1191/21-22/17 dated 27th December 2021.	

	Location: Powerhouse, Totelangso,Dima Hasao			Valid till 31.03.2025	
5	Batching Plant (Near Dam)				
A	Batching Plan (Dam), CTE, CTO	CTE	State Pollution Control Board, Assam	CTE obtained on 23rd June 2022 vide No. WB/SLC/T-1191/21-22/24.	
B		CTO	State Pollution Control Board, Assam	CTO obtained in Oct 2022 vide No. WB/SLC/T-1191/21-22/31	
C	CTO obtained for 714 cum/day against the requirement of 1000 cum/day – Needs to be amended prior to increasing the production rate	CTO	State Pollution Control Board, Assam	CTO amended on 3.1.23 vide No. WB/SLC/T-1191/21-22/39	
6	Crusher				
A	Permission of Village Panchayats (Gaon burah) for installation of crushers. Location: Totelangso, Dima Hasao.	Permission from Village Panchayats. The Assam Stone Crusher Establishment and regulation rule 2013 (Crusher)	Applied to Village Panchayats for installation of Crushers on 30-06-2021	Approval received.	NOC Received from Village Panchayats for setting up Crusher
B	Permission of Pollution Control Board for installation of crushers. Consent to establish–(CTE)	Permission from Pollution Control Board, Assam	Applied to Pollution Control Board for installation of Crushers.	CTE obtained from PCBA vide Ref. No. WB/SLC/T-1184/21-22/06/1065 dated 22nd October, 2021	
C	Permission of Pollution Control Board for installation of crushers. Consent to Operate –(CTO)	Permission from Pollution Control Board, Assam	Pollution Control Board Assam	CTO received from PCBA on 7/12.2021 vide Ref no. WB/SLC/T-1184/21-22/09/1152.	
D	Consent to Operate (CTO) obtained for primary and secondary		Pollution Control Board Assam	Crusher CTO amended on 11.1.23 vide No. WB/SLC/T-	

	crusher only. CTE and CTO for tertiary crusher to be obtained/ amended in the consent letters.			1184/21-22/16/2549	
6	Fuel dispensing Unit				
A	(NOC) from Deputy Commissioner Govt of Assam, for setting up Fuel dispensing Unit at Project location.	Deputy Commissioner Govt of Assam / Petroleum Act, 1934 and Rules 2002	The Deputy Commissioner, Dima Hasao, Haflong; Government of Assam.	NOC received from The Deputy Commissioner, Dima Hasao, Haflong; Govt. of Assam	
B				NOC Received from PESO. P/EG/AS/14/1630(P502141) dated 18/1/23	Valid till 31.12.23
C				Jt. Chief Controller of Explosives, Guwahati	Permission of storage of 20 kl. Valid till 31.12.23
7	CTE/CTO to be obtained for RO		Pollution Control Board Assam	CTE accorded on 14.3.23 vide No. WB/SLC/T-1269/22-23/4.	
				CTO accorded on 26.4.23 vide No. WB/SLC/T-1269/22-23/9	
8	CTE/CTO for proposed 6 lakh liter water treatment plant for construction		Pollution Control Board Assam	CTE for WTP plant obtained on 14.3.23 vide No. WB/SLC/T-1271/22-23/7.	
				CTO accorded on 26.4.23 vide No. WB/SLC/T-1271/22-23/12. Valid till 31.-3.2024.	
9	Magazine				
A	No Objection Certificate Obtained from "PESO" for establishment of Explosive magazine.	Petroleum and Explosives Safety Organization / Explosive Rules, 2008 (under act of 1884)	Petroleum and Explosives Safety Organization, Kolkata.	NOC obtained from Employer. Storage approval received from PESO. on 26th Nov'21 (Licence No.); E/EG/AS/22/63(E	Valid upto 31.3.24

				134742) from PESO, Guwahati.	
B	Permission for storage of Explosives (Explosive Van) at Longku police station for blasting operation for construction 120 MW Lowe Kopili Hydel Electric Project at Longku, Dima Hasao	The Superintendent of Police, Dima Hasao District, Haflong. / Explosive Rules, 2008 (under act of 1884)	The Superintendent of Police, Dima Hasao District, Haflong.	Permission Received vide letter No. HFG/DSB/80/2021/1122dated 02.06.2021	Permission Received from Superintendent of Police, Dima Hasao District, Haflong.
C	No objection Certificate for third party handling of explosives and its blasting operation which will be carried out by M/s. R.L. Poddar and North East Associates, Shillong		District Magistrate, Dima Hasao, Halflong	NOC received on 22nd October 2021 vide letter no. NCH/M-8/2021/6378-83	
D	No objection Certificate for grant of Explosive license and Magazine construction in favour of M/S R.L. Poddar for L&T.		District Magistrate, Dima Hasao, Halflong	Renewal of NOC received on 20.12.22 vide letter no. NCH/M-3/2022/2/59-63	
E	Fire NOC / Fire License	As per NOC of District Magistrate, Dima Hasao, a fire tendering facility is essential for storage of explosives in the Magazine	Sr. Station Officer, Fires and Emergency Service Station, Halflong, Dima Hasao	Application submitted on 19th November 2021 vide letter no LKHEP-PKG2/LNT/155/GL/085.	
F		NOC	Office of the Director , Fire and Emergency Services, Assam, Guwahati.	Renewal application submitted 28.2.23. Renewed on 30.3.23 valid	Copy of Fire NOC

				upto 28.3.24. Vide No. UBIN:299/566476/AAACL0140P/11/2022.	
10	Blasting				
A	Non Objection Certificate for blasting operations for construction of 120 MW Lowe Kopili Hydel Electric Project at Longku Dim Hasao	Deputy Commissioner, Dima Hasao District, Haflong. / Explosive Rules,2008 (under act of 1884)	Deputy Commissioner, Dima Hasao District, Haflong.	Approval Obtained. Letter no. NCH/M-8/2021 dated 14th Jul'21	
			The Superintendent of Police, Dima Hasao District, Haflong, Assam	Permission received vide letter No. HFG/DSB/80/2021/1122	Permission Received from Hon'ble Superintendent of Police, Dima Hasao District, Haflong.
			Sr. Station Officer, Fire & Emergency Service Station, Dima Hasao, Haflong, Assam	Permission received.	Application for Granting No objection for blasting operation vide Letter No: LKHEP-PKG2/LNT/153/GL/26 dtd. 2nd July'21
B			The District Magistrate, Dima Hasao, Haflong, Assam	Permission received.	Application for Granting No objection for blasting operation vide Letter No: LKHEP-PKG2/LNT/153/GL/NIL dtd. 13th July'21
			ASI L Bishuk Singha In-Charge, Longku out post.		Intimated vide letter No. LKHEP-PKG2/LNT/153/LL/33 dtd. 15th July'21
			Gaon Burah, Village- SAPRU	Intimated Blasting Timing 07 am to 8 am 1 pm to 2 pm 4 pm to 5 pm	Intimated vide letter No. LKHEP-PKG2/LNT/153/LL/34 dtd. 15th July'21
			Office-in-Charge Umrangsu Police Station	Intimated Blasting Timing 07 am to 8 am 1 pm to 2 pm 4 pm to 5 pm	-Intimated vide letter No. LKHEP-PKG2/LNT/153/LL/35 dtd. 15th July'21

C		Request for issuing No Objection Certificate for explosive supply chain management & blasting operation	The Hon'ble Deputy Commissioner, Dima Hasao District, Haflong, Assam	Permission Received vide letter No. NCHM/M-8/2021/6378-83 dtd. 22nd Oct'21	
D	Blasting permission at Hamren Division, Karbi Anglong [Left Bank of Dam]			Permission received from DC Office, West Karbi Anglong, Hamren. Valid till 30th June 2022. Renewal application valid till 30.04.23. Blasting time 10:00 to 16:00. Order No. HCA.26/2022/7 dated 14th Oct'2022.	No blasting in the left bank during this reporting period.
E	Night Shift Blasting Permission inside tunnels [Panimur range]		DC Office, Haflong, Dima Hasao.	Permission Received vide letter No. HCA.26/2009-16/498 dated 12 January, 2022. Valid up to 31.03.2023.	Renewal of application submitted on 22.3.23. Renewed permission vide No. NCH/M-3/2023/70 dated 27.05.2023 and valid upto 31.03.24. (After 31 March no night blasting carried out)
F	Request for permission for storage of Explosives (Explosive Van) at Longku police station for blasting operation for construction 120 MW LKHEP at Longku, Dima Hasao		Letter No: LKHEP-PKG2 /LNT /153 /GL/23 dtd. 31st May'21	Permission given upto 21st July 2021 and revoked back on 22nd July 2021.	
11	Labour License CP2				
A	Permission of Labor commission for labour license	Labour Laws / Factories Act, 1948 and Amendments (1987)	Government of Assam Office of the Labour Commissioner Assam Gopinath	Valid Labour license vide 299/566476/AAACL0140P/11/2022 dated 6.12.22.	Valid till 29/11/2024 Covered 1500 workers. Copy of the Labour License (Annexure 3)

			Nagar, Guwahati 781016		
B	Building and other construction works	Building and other construction works (Regulation of Employment & Conditions of Service) Act, 1996 and the Rules made thereof.	Government of Assam Office of the Labour Officer, Dima Hasao, Halflong	Sl No. 133 License No. B&OCW-133 Dated 21st September 2021	Validity 1/11/2021 to 31/09/2024
12	Labour License CP3	Labour Laws / Factories Act, 1948 and Amendments (1987)	Government of Assam Office of the Labour Commissioner Assam Gopinath Nagar, Guwahati 781016	Valid Labour license vide License NO CLL/2023/02772 dated 2.3.23..	Validity till 26.2.24 for 50 labour.
13	Labour License CP4	Labour Laws / Factories Act, 1948 and Amendments (1987)	Government of Assam Office of the Labour Commissioner Assam Gopinath Nagar, Guwahati 781016	Valid Labour license vide License NO CLL/2023/02048 dated 20.2.23..	Validity till 12.2.24 for 20 labour.
14	Labour License CP1	Labour Laws / Factories Act, 1948 and Amendments (1987)	Government of Assam Office of the Labour Commissioner Assam Gopinath Nagar, Guwahati 781016	Valid Labour license vide License NO CLL/2023/03304 dated 15.3.23..	Validity till 11.3.24 for 20 labour. (Annexure 19)
15	Migrant workers				
A	Certificate of Registration of APGCL under Inter-State Migrant Workmen (RE& CS) Act, 1979		Labour Commissioner, Guwahati	Issued by Assistant Labour Commissioner, Guwahati on 11.5.2023. (**Annexure 4**)	
B	Migrant Labour License CP4	Labour Laws / Factories Act, 1948 and Amendments	Government of Assam Office of the Labour Commissioner	Valid Labour license vide License NO MGW(E)/2023/00	Validity till 24.5.24 for 30 labour for CP-4.

		(1987)	Assam Gopinath Nagar, Guwahati 781016	019 dated 25.5.23..	
C	Migrant Labour License CP2	Labour Laws / Factories Act, 1948 and Amendments (1987)	Government of Assam Office of the Labour Commissioner Assam Gopinath Nagar, Guwahati 781016	Issued on 21.09.2023 for 100 workers and is valid till 20.09.2024 for CP-2	(Annexure 5)
D	Migrant Labour License CP3	Labour Laws / Factories Act, 1948 and Amendments (1987)	Government of Assam Office of the Labour Commissioner Assam Gopinath Nagar, Guwahati 781016	Issued on 25.09.2023 for 30 workers and is valid till 25.09.2024 for CP-3	(Annexure 6)
15	Tree Cutting				
A	NOC for tree Cutting (CP2)	Indian Forest Act, 1927	Forest Department Assam	Tree cutting so far (241 nos) were done under CP-2 with the assistance/ presence of officials of Forest Department, Panimur Range, Dima Hasao (West) Division and APGCL. All the trees are marked and felled by the respective Forest Department.	.
B	NOC for tree Cutting (CP1)	Indian Forest Act, 1927	Forest Department Assam	Revenue submitted to the Forest Department. NOC will be issued for the trees cut so far.	(Annexure 7)
C	NOC for tree Cutting (CP4)	Indian Forest Act, 1927	Forest Department Assam	NOC yet to be obtained	Under process
16	Ground water extraction				
A	CP-2	Environment (Protection) Act, 1986. NOC in compliance with the	Central Ground water Authority or District Administration	Application for Permission of ground water extraction submitted vide Letter No:	As surface water will be used for construction works, the NOC was not taken from CGWA.

		Hon'ble NGT Vide Order of 15 April 2015		LKHEP-PKG2/LNT/153/GL/78 dtd. 09th Nov'21	
B	CP-1	Environment (Protection) Act, 1986. NOC in compliance with the Hon'ble NGT Vide Order of 15 April 2015	Central Ground water Authority or District Administration	NOC No. CGWA/NOC/INF/ORIG/2023/18216 Dated 17.4.23.	
C	CP-3	Environment (Protection) Act, 1986. NOC in compliance with the Hon'ble NGT Vide Order of 15 April 2015	Central Ground water Authority	NOC from CGWA on 23.12.23 and valid till 21.12.28.	(Annexure 8)
17	Surface water extraction				
A	NOC for surface Water use for construction CP-2		Water Resource Department, Govt. of Assam.	Vide Letter No: EE/WRD/DNK/Misc/2022-23/11 dated 3.5.23id till 31.-3.2024. Validity of NOC from WRD is upto December 2024. Vide letter no EE/WRD/DNK/MISC/2022-23/08 dated 30.03.2023	(Annexure- 20)
B	Permission from Gaon Bura for water extraction from Longku nala			Permission taken by CP-2.	
C	Permission from Gaon Bura for water extraction from local streams / ponds			Permission taken by CP-3 from the respective Gaon Buras.	

D	Permission from Gaon Bura for water extraction from local streams / ponds			Permission will be taken by CP-4 soon from the respective Gaon Buras.	(Annexure 9)
18	Permission from grid power				
	Permission for Temporary grid power connection at Site Infrastructure facility			Available. Contractor's Letter LKHEP-PKG2/LNT/153/ GL/009 dtd. 28th Dec'20	
19	PUC of the vehicles		Pollution Control Board Assam	All the vehicles have valid PUC	
20	CTE for sewage treatment plant proposed under CP-1 for a built-up area of 6720 sqm of permanent colony		Pollution Control Board Assam	Will be applied before construction of the STP	
21	Insurance Policies				
A	Insurance Policies of CP2				

Policy Name	Policy Number	Coverage Period
Group Personal Accident Policy	4005/101781287/08/000	01-04-23 to 31-03-24
Group Personal Accident Policy	4005/102843874/08/000	31-03-23 to 30-03-24
Contractor's Plant and Machinery	5011/R/150019780/05/000	01-04-23 to 31-03-24
CAR Policy	12070044200300000015	28-10-20 to 31-08-24

B	Insurance Policies (CP3)		Obtained on 22.08.22	Valid till 13.03.25

Policy Name	Policy Number	Coverage Period
Workman Compensation Insurance (10 skilled, 30 Semi skilled, 10 unskilled)	4514044220800000004	22.08.22 to 13.03.25

C	Insurance Policies (CP4)		Obtained on 12.07.22	Valid till 11.07.23

Policy Name	Policy Number	Coverage Period
Workman Compensation Insurance (10 skilled, 30 Semi skilled, 10 unskilled)	4010/252569944/01/000	12.07.23 to 11.07.2024 (Annexure 10)

D	Insurance Policies (CP1)		Obtained on 20.2.23	Valid till 19.2.24

Policy Name	Policy Number	Coverage Period
Workman Compensation Insurance	D094467557	20.2.23 to 19.2.24

3.0 Compliance to Environmental Covenants from the ADB Loan Agreement

Compliance to the environment safeguard loan covenants are shown in the table no 4.

Table 4 : Compliance of Loan Covenants

Covenant	Compliance Status	Remarks	Remarks as on 31.12.2023
Schedule 4, Para 6			
The Borrower shall ensure or cause the EAto ensure that it shall not allow commencement of civil works under a Works contract which involves environmental impacts until the EA has obtained the final approval of the EIA from the relevant environmental authority of the Borrower and the State and ADB	Not Complied. ESCAP is required.	Environment Clearanceobtained on 04 September2019 from MoEFCC. EIA has been cleared by ADB in 2018. The modified EC with revised scope was yet to be obtained although the implementation has commenced (not yetapplied online through PARIVESH Portal) and the EIAaddendum reflecting modifications in design/ unanticipated impacts etc. wasstill under preparation.	Applied in the PARIVESH 02 on 04.09.23. EDS replied on 25.09.23. EAC held on 26.10.23.
iii)The EIA is updated to reflect the turnkey contractor's detail design and up to date baseline.	Partially Complied	Pre-construction baseline for environment (10 km radius of project component locations including 220kV power evacuation line and 33kV power transmission line) and biodiversity was underway. Annual bird count was yet to beconducted. EIA Addendum is yet to incorporate all assessments related to scope/ design modifications and unnoticed/ unanticipatedimpacts.	Biodiversity survey of 220 KV completed but 33 KV mostly covered.
iv) such updated EIA is cleared by ADB	Not complied. ESCAP is required	EIA Addendum reviewed and corrections suggested by ADB. Revised EIA Addendum (first phase) was submitted on 30 May 2023 and is under review.Works had been	Revised EIA addendum is being updated.

		started without an ADB cleared EIA addendum	
Schedule 5, Para 5			
The Borrower shall ensure, or cause the EAto ensure, that the preparation, design, construction, implementation, operation anddecommissioning of the project, and all Project facilities comply with (a) all applicable laws and regulations of the Borrower and the State relating toenvironment, health and Safety,	Partially Complied	Amended EC from MoEFCC; inter - state labor license for CP-2 and 4; few permissions were under renewal.	Application submitted in the PARIVESH for amendment. CP-4 obtained Interstate labour license. CP-2, CP-3 obtained Interstate labour license. (corrected)
(d) all measures and requirements set forthin the EIA and EMP, and any corrective or preventive actions set forth in a SafeguardsMonitoring Report.	Partially Complied.	Corrective action plans of earlier Missions have beenpartially complied. Outstanding issues included in the revised ESCAP agreed during the Mission and given in Appendix2	Updated ESCAP prepared and submitted to ADB on 27.10.23.
Schedule 5, Para 9			
The Borrower shall ensure or cause the EAto ensure that all necessary budgetary and human resources to fully implement the EMP, and the RIPP as required, are made available on a timely basis.	Being complied	The Mission recommended appointment of a Qualified Health and Safety expert under PMU considering the risks involved in the construction activities. Also recommended the appointment of a Sr. Env. Expert in PMC to assist the Environment Safeguards Specialist and expedite implementation of environmental safeguards (gaps as identified by the Mission are elaborated in the AM) through day-to-day supervision and guidance at site; The Mission requested appointment for suitably	Appointment of 3 experts 1. Office order is there for Environment, Health and Safety expert under PMU. Mr Dhiraj Borthakur looks after EHS at site. 2. Appointment of a Sr. Env. Expert in PMC- under review 3. suitably qualified and experienced expert/s to conduct the assessment of downstream and backwater assessment study including that of ecological modelling – will

		qualified and experienced expert/s to conduct the assessment of downstream and backwater assessment study including that of ecological modelling	be inducted in due course
Schedule 5, Para 11			
Safeguard Monitoring and Reporting. The Borrower shall ensure or cause the EAto ensure the following: (a) submit semi-annual Safeguard Monitoring Reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission.	Being compiled	EMC requested to submit Quarterly and Semiannual external validation reports toADB. Internal EMR is being submitted semi-annually	EMC submitted quarterly validation report for Jul to Sept 23. EMC submitted semi annual validation report for Jan to June 2023. APGCL submitted Semi annual EMR for June to Dec 2023.
Schedule 5, Para 13			
Labour Standards Health and Safety. The Borrower shall ensure or cause the EAto ensure that works contracts under that Project follow all applicable labour laws of the Borrower and the State and that these further include provisions to the effect that the contractors: (a) carry out HIV / AIDS awareness programs for labour and disseminate information at worksites on risks of sexuallytransmitted diseases and HIV / AIDS as partof health and safety measures for thoseemployed during construction. and	Being complied	HIV /AIDS awareness camps to be conducted regularly	HIV /AIDS awareness camps conducted by CP-2, CP-4 and rest contractors will initiate soon.
(b) follow and implement all statutory provisions on labour (including not	Being complied	working conditions at critical sites under CP-2; and camp facilities for	Status of CP-4 camps is under improvement.

employing or using children as labour, equalpay for equal work) health, safety welfare, sanitation, and working conditions.		CP-4 need significant improvements	
Such contracts shall also include clauses fortermination in case of any breach of the stated provisions in the contract	Being complied		

4.0 Compliance to Project Administration Manual (PAM)

Compliance to the Project Administration Manual on Environment Safeguards are shown in table 5.

Table 5 : Compliance to PAM

Organization		Tasks	Compliance Status	Remarks
Executing Agency	Government of Assam			
	Project steering committee- Comprising Principal Secretary, Energy with Managing Director, APGCL and AEGCL		Complied	The committee is in place.
	Grant fund related advisory committee- Comprising Principal Secretary, Energy; Managing Director, APGCL; Principal Secretary, Water Resources Department; representatives of Dima Hasao and Karbi Anglong ADC as well as districts of Nagaon, Morigaon and Hojai			Will be formed before the implementation of the early warning system. Coordination between the relevant departments are being maintained for the implementation of the Grant.
Implementing Agency	Assam Power Generation	(i) Conduct overall coordination, preparation, planning, and	Complied	Adhered

Organization		Tasks	Compliance Status	Remarks
	Corporation Limited (APGCL) supported by PMC	implementation of all field level activities; (ii) Implement EMPs following ADB's Safeguards Policy Statement 2009, IFC's Environment, Health and Safety general guidelines and national regulations etc. at the project site; (iii) Undertake and supervise compensation to the affected persons based on the entitlement matrix in the RIPP; (iv) Oversight construction contractor(s) on monitoring and implementing mitigation measures during design, construction and operation phases of the project before contracts completed; (v) Advise and coordinate to finalize survey and detailed design and update that safeguard documents following detailed design and survey result; (vi) Engage in grievance redress and ensure the prompt resolution of complaints; (vii) Set up appropriate record keeping system; (viii) Disclose relevant information to the affected people and continue consultations; (ix) Provide training and awareness on environmental and	Being complied Being complied Being complied Complied and ongoing Complied through APGCL and ongoing Complied through MPR Ongoing Ongoing Complied and ongoing	

Organization		Tasks	Compliance Status	Remarks
		social issues to the project staff and EPC contractor(s); (x) Preparation of semi-annual and annual environmental monitoring reports and semi-annual social monitoring reports; and (xi) Liaise with the concerned ministries, authorities, and government departments for the environmental and resettlement related issues of the project implementation.	Being complied	Since the EIA was based on environmental surveys completed in 2015, given the passage of time, APGCL undertook an up-to-date suite of surveys (including flora and fauna surveys following previous methodologies) in 2021 to confirm if there have been any significant changes to the environmental baseline in the past 5 years and the impact assessment remains valid. External Monitor also carried out flora and fauna survey with in 10 km radius of the project in April and Mar, 2023. These surveys also provide an up-to-date baseline for the purposes of monitoring the project's environmental impacts during construction and operation. The EIA is being updated to reflect the detailed designs

Organization		Tasks	Compliance Status	Remarks
				and survey results for review and clearance of ADB, including any temporary enabling works. The CEMP of the Package 1, 2, 3, 4 contractor are being updated by APGCL to include the environmental clearance and forest clearance conditions and, in response to the ongoing COVID- 19 pandemic.
		The designated dedicated social and environmental safeguards cell (SESC) with a full-time environmental specialist and a full-time social specialist. The SESC will implement EMP and RIPP and be responsible for safeguards monitoring.	Social and environmental safeguards cell (SESC) formed within PMU	Dr Deepak Kumar Baruah as Environment Exert and Mr Pankaj Kumar Hazarika as Social Expert with a support team from APGCL.
Para 49. GRM		A grievance redress mechanism (GRM) will be established to deal with complaints on environmental and social issues in a timely manner and adequately publicized amongst the affected peoples.	Being complied. The structure of the GRM and methodology for grievance redress are described in section 8 of this report below.	Resettlement NGO gave awareness training on the GRM of the LKHEP. No grievances reported on environment so far.
Para 53.		a)training and capacity building b)Dam safety expert	a) Ongoing	TOR for training and capacity building are

Organization		Tasks	Compliance Status	Remarks
			b) International Dam Safety Expert of the External Monitor will act as the Independent Dam Safety Expert for the project.	being prepared and bid evaluation is under process.. Independent Dam Safety Expert of External Monitor will review and designs of the dam components and implementation of the provisions of Dam Safety. As per the provision of the Dam Safety Act 2021, State Dam Safety Committee has been constituted by Government of Assam. Training and capacity building will be carried out under Dam Safety organization as soon as it is formed under the same Act.
		a)External monitor appointment	External monitor engaged.	External Monitor was engaged in the month do December, 2021. Subsequent visits were carried out in the month of February, March and June 2023 during this reporting period.

Organization		Tasks	Compliance Status	Remarks
				Inception report and Validation report of six monthly Semi Annual Report for July to December, 2021, Jan to June 2022, July to Dec 2022, Jan to June 2023 submitted to ADB.
Para 56. Unanticipated impact		In the event of any unanticipated environmental impacts during project implementation, including change in project scope or design, APGCL will update the EIA/EMP as appropriate, which will be disclosed on the ADB website. For any non-compliance with the EMP APGCL will take necessary corrective actions to bring the project back into compliance.	Project layout changed for the compliance of FAC, MoEF&CC and MOC of CEA. Addendum for EIA update is under process.	
Para 62. HIV/ AIDS		NGO will carry out HIV/AIDS awareness for their laborers at work sites	Being complied and ongoing	AIDS awareness were done by the package 2 contractor.
Para 63. Health		APGCL will ensure that contractors provide adequately for the health and safety of construction workers	Being complied	
Para 64. Labour		APGCL will ensure that civil works contractors comply with all applicable labor laws and regulations, do not employ child labor for construction and maintenance activities, and provide appropriate facilities for women and children in construction campsites; contractors do	Being complied	

Organization		Tasks	Compliance Status	Remarks
		not differentiate wages between men and women for work of equal value.		
Para 67. Safeguards monitoring.		APGCL must adhere to the EMP and CRTDP during contract implementation as prepared in accordance with ADB's SPS 2009 and as agreed and/or endorsed by the government. APGCL will provide environmental and social monitoring reports to ADB on a semi-annual basis during construction phase and on an annual basis during operation phase. The reports will describe implementation progress of environment and resettlement activities and compliance issues and include quantitative monitoring data in accordance with the EIA/EMP and CRTDP and CRIPP, respectively. The environmental and social monitoring reports and other relevant safeguard reports will be posted to the ADB website and disclosed locally by APGCL. In the event of any unanticipated environmental or resettlement impacts during implementation, or if monitoring identifies a breach of performance standards that should be complied with by APGCL and/or their contractors, APGCL will submit to ADB an updated EIA/EMP, CRTDP and CRIPP or	Being complied. External monitor engaged and will continue to prepare the validation reports every six months and quarterly reports	

Organization		Tasks	Compliance Status	Remarks
		a time-bound corrective action plan. The External Monitor will also prepare semi-annual monitoring validation reports during project construction and annual monitoring validation reports during project operation for submission to ADB for disclosure on the ADB website.	every three months. These reports will be submitted to ADB.	

5.0 Compliance to Contract

The table 6 shows the compliance to the contract provision during the period July 2022 to December 2023.

Table 6 : Compliance to Contract provisions

Contract Package	Contract Provisions / Status of the contract package	Compliance Status	Remarks
Package 2	Construction phase : Section 6, General conditions clause 6.1.3.2. • The Contractor shall within one month of receipt of Commencement Date, appoint an Environmental Officer • Environmental Officer will submit a Monthly Environment Report every month.	Complied Complied for CP2.	CP-2- appointed Mr Manoj Yadav as Environment Expert. Submission of monthly Environment Report started from December 2023 for CP-2. App based safety monitoring system of L&T.

Contract Package	Contract Provisions / Status of the contract package	Compliance Status	Remarks
	Clause 6.1.10.1.a. • The Employer has a goal to create a zero-incident work environment with a safety culture Clause 6.1.10.1.b. • The Contractor will be responsible for the security, safety & health and Group insurance of his Employees. Clause 6.1.10.1.c. • Provide and maintain at his own cost, fencing, warning signs and watch & ward. Clause 6.1.10.1.d.	Being complied Complied	Package 2 CEMP and H&S Plans submitted by the contractor and it has been approved by APGCL and PMC. Package 1,3 and 4 CEMP and H&S Plans were also approved by APGCL, PMC. Root cause analysis are carried out by the contractor and accordingly the corrective action are taken to avoid such kind of accidents in future after any dangerous occurrences, near miss, non-work-related fatalities, LTI. After reviewing all the monthly safety and Monthly Environment reports PMC and APGCL observations are made and communicated to the contractor for compliance. All the observations are also mentioned in the PMC's MPRs. Those which are not complied are flagged in the Six monthly monitoring reports. Although L&T has online safety reporting system, Monthly Safety Report submitted regularly. All the insurance are valid.

Contract Package	Contract Provisions / Status of the contract package	Compliance Status	Remarks
	• Take all reasonable steps to protect the environment. Clause 6.1.10.1.e. • The contractor will protect the environment following the principles of Approved Environment Management Plan. Clause 6.1.10.1.f. • The Officer-in-Charge of Safety will submit monthly safety report Clause 6.26.3 • Environmental obligations	Being complied Being complied Being complied Being complied Being complied	Non compliance with corrective actions are reported in Table 8

Contract Package	Contract Provisions / Status of the contract package	Compliance Status	Remarks
Package 3 (Electro Mechanical)	**General conditions of the contract** 22.2 Labour 22.2.1 engagement of staff and labour a) except as otherwise stated in the specification, the contractor shall make arrangements for the engagement of all staff and labour, local or otherwise, and for their payment, housing, feeding and transport. 22.2.3 Labour laws a) the contractor shall comply with all the relevant labour laws applicable to the contractor's personnel, including laws relating to their employment,	Ongoing	CP-3-Appointed Mr K Pathak as Health and Safety Officer. There is Mr. Rohit as Environment Officer.

Contract Package	Contract Provisions / Status of the contract package	Compliance Status	Remarks
	health, safety, welfare, immigration and emigration, and shall allow them all their legal rights. 22.2.7 Health and safety a) the contractor shall at all times take all responsible precautions to maintain the health and safety of the contractor's personnel…. b) the contractor shall appoint an accident prevention officer at the site, responsible for maintaining safety and protection against accidents. c) the contractor shall send to the project manager, details of any accident as soon as practicable after its occurrence. 22.2.11 Supply of water The contractor shall, having regard to local conditions, provide on the site and adequate supply of drinking and other water for the use of contractor's personnel. 22.4 Site regulations and safety Such site regulations shall include, but shall not be limited to, rules in respect of security safety of the facilities, gate control, sanitation, medical care and fire prevention. 22.8 Watching and lighting The contractor shall provide and maintain at its own expense all lighting, fencing and watching when and where necessary for the proper execution and the protection of the facilities, or for the safety of the owners and occupiers off adjacent property and for the safety of public. 34. Insurance a) cargo insurance during transport b) installation all risks insurance c) 3rd party liability insurance d) automobile liability insurance e) workers compensation f) employers liability **Special Conditions of the contract** 46.4 the contractor shall comply with all applicable national provincial, and local environmental laws and regulations.	Partially complied Partially complied and to be improved To be appointed Will adhere Complied Partially complied Ongoing and improvements required Complied	Monthly environment Report submitted by CP-3 in December 2023. Monthly Safety Reports also submitted in Dec, 2023.

Contract Package	Contract Provisions / Status of the contract package	Compliance Status	Remarks
	The contractor shall comply with (i) the measures and requirements set forth in the initial environment examination and the environmental management plan and (ii) any corrective or preventive actions set out in the safeguards monitoring reports that the employer will repair from time to time to monitor implementation of the initial environmental examination and the environmental management plan. The contractors location with these measures requirements and actions.	Partially complied and improvement required. CEMP submitted.	

Contract Package	Contract Provisions / Status of the contract package	Compliance Status	Remarks
Package 4	**General Condition of the Contract** 9.4 The contractor shall comply with all laws in force in the country where the facilities are to be implemented. The laws will include all local, state, national, or other laws that effect the performance of the contract and bind upon the contractor. 22.2 Labor 22.2.3 Labor Laws The Contractor shall provide equal wages and benefits to men and women for work of equal value or type and comply with the measures set forth in the Gender Action Plan. 22.2.5 Working Hours (a) Normal working hours are: 8:00 a.m. to 5:00 p.m. inclusive of one-hour lunch break 22.2.7 Health and Safety a) the contractor shall at all times take all responsible precautions to maintain the health and safety of the contractor's personnel….	Ongoing and to be improved Complied and ongoing Complied and ongoing Complied and ongoing To be appointed	CP-4-Appointed Mr S Das as environment Expert. Monthly Safety Reports also submitted in Dec, 2023.

Contract Package	Contract Provisions / Status of the contract package	Compliance Status	Remarks
	b) the contractor shall appoint an accident prevention officer at the site, responsible for maintaining safety and protection against accidents. c) the contractor shall send to the project manager, details of any accident as soon as practicable after its occurrence. 22.2.11 Supply of water The contractor shall, having regard to local conditions, provide on the site and adequate supply of drinking and other water for the use of contractor's personnel. 22.4 Site regulations and safety such site regulations shall include, but shall not be limited to, rules in respect of security safety of the facilities, gate control, sanitation, medical care and fire prevention. 22.8 Watching and lighting The contractor shall provide and maintain at its own expense all lighting, fencing and watching when and where necessary for the proper execution and the protection of the facilities, or for the safety of the owners and occupiers off adjacent property and for the safety of public. 34. Iinsurance a) cargo insurance during transport b) installation all risks insurance c) 3rd party liability insurance d) automobile liability insurance e) workers compensation f) employers liability **Special Condition of the Contract** 22.2.3 Labor Laws Added the following as sub-paragraph (d) under Sub-Clause 22.2.3: (d) The Contractor shall not make employment decisions based upon personal characteristics unrelated to job requirements. The Contractor shall base the employment relationship upon equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation	Ongoing Complied and ongoing Partially complied Partially complied Complied Complied	

Contract Package	Contract Provisions / Status of the contract package	Compliance Status	Remarks
	(including wages and benefits), working conditions and terms of employment or retirement, and discipline. 22.2.7 Health and Safety Added the following as sub-paragraph (d) under Sub-Clause 22.2.7 (d) The Contractor shall conduct health and safety programs for workers employed under the project, and shall include information on the trafficking of women and the risk of sexually transmitted diseases, including HIV/AIDs in such programs. The Contractor shall throughout the contract (including the Defect Liability Period): (iv) The contractor shall follow all covid related protocol issued by competent authority during execution of the work. (e) The Contractor is responsible for establishment of preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks of the construction site work to the health and safety of local communities.	 Partially complied. (Women not engaged so far) Partially complied Partially complied	

Contract Package	Contract Provisions / Status of the contract package	Compliance Status	Remarks
Package 1 (Building and internal roads)	**General conditions of the contract** 4.8 Safety procedures The contractor shall (a) Comply with all applicable safety regulations (b) take care for safety of all persons entitled to be on site (c) use reasonable efforts to keep the site and works clear for unnecessary obstruction so as to avoid danger to these persons (d) Provide fencing lightings gardening and watching of the works until completion and taking over under clause 10 and (e) Provide any temporary works (including roadways, footpaths, guards and fence) which may be necessary, because of the execution of the	 Partially complied Ongoing Ongoing Initiated	CP-1-Appointed Mr P. Saikia as environment Expert. Monthly environment Report submitted by

Contract Package	Contract Provisions / Status of the contract package	Compliance Status	Remarks
	works, for the use and protection of the public and of owners and occupiers of adjacent land. 4.18 Protection of the environment the contractor shall take all necessary reasonable steps to protect the environment (both on and off the site) and to limit damage and missions to people and property resulting pollution, noise and other results of his operation. The contractor shall ensure that emissions surface discharges and effluent from the contractors activities shall not exceed the clause stated in the specification or prescribed by applicable laws. 6.4 Labour laws The contractor shall comply with all the relevant labour laws applicable to the contractor's personnel including laws resulting to their employment health safety welfare immigration and emigration and shall allow them all their legal rights. The contractor shall require his employees to obey all applicable laws including those concerning safety at work. 6.5 Working hours No work shall be carried out on the side on locally recognised days of rest or outside the normal working hours stated in the contract data unless a) Otherwise stated in the contract, b) the engineer gives consent, or c) Is unavoidable, or necessary for the protection of life or property or of the safety of the works, in which case the contractor shall immediately advise the Engineer 6.6 Facilities for staff and labour except as otherwise stated in the specification the contractor shall provide and maintain all necessary accommodation and welfare facilities for the contractors' personnel the contractor shall also provide facilities for the employer's personnel as stated in the specification. The contractor shall not permit any of the contractors' personnel to maintain any temporary or permanent living quarters within the structures forming part of the permanent works.	Initiated To be initiated. CEMP submitted. To be followed To be improved, partially complied Complied Partially complied	CP-1 in Dec, 2023. Monthly Safety Reports also submitted in Dec, 2023

Contract Package	Contract Provisions / Status of the contract package	Compliance Status	Remarks
	6.7 Health and safety The contractor shall at all time take all responsible precautions to maintain the health and safety of the contractors personnel. The contractor shall appoint an accident prevention officer at site responsible for maintaining safety and protection against accidents. the contractor shall send to the engineer details of any accident as soon as practicable after its occurrence. The contractor shall conduct and HIV aids awareness programme via an approved service provider. 18.2 Insurance for workers and contractors equipment the insuring party shall ensure the works plant materials and contractors documents for not less than the full reinstatement cost including the cost of demolition removal of debris and professional fees and profit. 18.4 Insurance for contractors personnel The contractor shall effect and maintain Insurance against liability for claims, damages, losses and expenses (including legal fees and expenses) arising from injury, sickness diseases or death of any person employed by the contractor or any other of the contractor's personal.) **Special conditions of the contract** 1.3 Environmental compliance 1.3 .1 General reference is made to the environmental requirements given in: a) The law and regulation of the comment of a Assam/ India and relevant standards b) employers requirement for environmental compliance c) sub clause of general condition of the contract and any other clause or sub clause have any relevance to environment. d) Local traditions and customs of project area. 1.3.2 environmental compliance and miscellaneous The contractor shall within one month of receipt of the commencement date, appoint an Environmental Officer for the works, who's broad responsibilities are to guide the construction personnel on environmental matters, to	Ongoing HSE appointed Complied Complied	

Contract Package	Contract Provisions / Status of the contract package	Compliance Status	Remarks
	communicate and to make liaison with the Employer, the PMC, Government of Assam and local authorities. 1.11 Environmental Protection 1.11.1 Health, safety and security a) the employer has a goal to create zero-incident work environment with an safety culture based on teamwork and leadership. b) the contractor will be responsible for the security, safety and health and group insurance of his employees. c) provide and maintain at his own cost, fencing warning science and watch and ward, when and where necessary or required by the PMC / Engineer or by any duly constituted authority for the protection of the works or for the safety and convenience of the public or others. d) take all responsible steps to protect the environment on and off the site and to avoid damage or nuisance to person or property of the public or others resulting from pollution noise or other causes arising as a consequence of its method of operation, e) the contractor will protect the environment following the principles of approved environment management plan the contractor will submit with his tender a return statement assuring compliances with all environments safeguard related clause under section 6. f) The Officer-in-charge of safety will submit monthly safety report. 1.15 electrical safety measures • Lightning protection to be done as per is codes applicable. • Safety parameters as indicated under Indian electricity rules 1956 , etc.	Ongoing Partially complied Appointed EHS officer (a-e) will be followed during construction f) Safety report submitted Will be followed	

6.0 Compliance to Environmental Management Plan

Compliance of Environment Managemental Management Plan implemented by all the 4 contractors.

Table 7. Compliance to Environmental Management Plan

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
DESIGN AND PRE-CONSTRUCTION PHASE				
1	Impact on air, water, noise, soil Exposure to safety related risks	Location and design of power house, office, substation and colony	• Siting of colony away from construction areas including • plantation all around colony. • Drainage system with de-silting chamber, will be provided all around power house, office, substation and colony. • Solid waste storage bin system will be provided at required location. • All buildings are designed and will be constructed as per seismic zone provision. • The site-specific earthquake study has been completed by Department of Earthquake Engineering, IIT Roorkee. The site-specific design parameters recommended by IIT for MCE and DBE conditions are recommended as 0.36g and 0.18g for horizontal and 0.24g and 0.12g for vertical ground motion, respectively have been considered. The design has been reviewed by independent experienced dam expert appointed by ADB and found to be adequate. • Dam safety surveillance and monitoring aspects are included. Personnel Safety equipment will be	Planned and is in tender doc and in contract EMP. (CP-2, CP-3)    Mr. Niraj Verma (Hon'ble Chairmam APGCL) visited Lower Kopili site along with Mr. Bhibhu Bhuyan (MD) and Mr. Mridul Saikia (PD). 

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
			provided at required location.	
2	Release of chemicals ashes in receptors (air, water, land)	Equipment specifications and design parameters.	• CFC not used in substation transformers or other project facilities or equipment by concerned agencies. • Processes, equipment, and systems will not to use chlorofluorocarbons (CFCs), including halon, and their use.	Incorporated in tender doc. CFC not used in substation transformers or other project facilities or equipment so far.
3	Exposure to noise	Power Plant /Substation location	Design of plant enclosures to comply with IFC EHS noise regulations (85 dB(A) at work sites for heavy industry.	Planned and is in tender doc EMP (CP-1, CP-2, CP-3, CP-4)
4	Acquisition of private land	Location of powerhouse, head works.	Acquisition of agricultural and cultivable land minimized.	Construction work zones are clustered to minimized the use of agricultural and cultivable land. CP 1, 2 & 3 facilities are concentrated in three patches in revenue land and in 4 patches of Forest land. 
5	Social inequities	Involuntary resettlement or land acquisition.	• Compensation will be paid for temporary / permanent loss of productive land as per Govt. rules and regulation. • A list of all the affected persons by type of losses and extent of damages has been prepared through and the same will be compensated as per	Compensation done as per entitlement matrix of CRDTP. Mostly completed. Land compensation completed 100 %. and other R&R assistance also initiated from April 2022. 99% R&R assistance paid in Dima Hasao and Micro plan for Karbi Anglong prepared for payment. Transmission line compensation also initiated. 102 out of 189 towers land

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
			Resettlement and Tribal Development Plan prepared as per GoI and ADB SPS 2009 requirements.	compensation paid and 54 zirat compensation also paid during this period.
6	Loss of precious Ecological values/impacts on precious species due to acquisition of 523 ha of forest land	Encroachment into precious ecological areas.	• Minimize acquisition of forest areas. • Avoid encroachment by careful site and alignment selection of access roads, and transmission lines. • Afforestation of 1,046 ha (1:2 tree planting ratio) of degraded forest land. • A compensatory afforestation and biodiversity conservation and management plan has been prepared (Annex 9). • Cut only trees marked by the Forest Department • Ensure that the area is cleared as per directives/delineation of Forestry staff	If both permanent (including underground areas) and temporary use areas are included, only 297.75 Ha will be required rest will be kept as Green Belt (198.746 Ha) and Safety Area (26.55 Ha) out of 523.465 ha forest land. As per Government norms it is 1:1 is for Compensatory afforestation of Government projects. If CAT plan plantation areas are included it comes around 1:3. Compensatory Afforestation is planned to be included in the Annual Operation Plan of the Forest Department, Govt. of Assam for the year 2022-2023. Biodiversity Conservation plan is yet to be initiated but the Biodiversity Management Committee was formed and 3rd meeting was conducted on 12.12.23 during this reporting period. MOM of BMC 2 and 3 attached. Annexure 22, Annexure 23. Trees are marked and cut by the Forest Department only.
7	Nuisance to neighbouring properties	Noise related	• Substations, powerhouse, head works designed to ensure noise will not be a nuisance. Noise will be controlled within IFC	Quarterly test are being carried out in Aug, Nov, Dec 2023 and found within the CPCB norms.

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
			• EHS noise standards. In any case, there is no proximity of residences to these features.	
8	Flooding hazards/ loss of agricultural production	Interference with drainage patterns/ Irrigation channels	• The alignment of river channel and siting of project facilities are done to avoid any flooding hazard. Detailed hydrological assessments have been carried out as part of detailed design. Additional IWRM management plan has been prepared. • Dam Break Analysis and disaster management plan has been prepared (Annex 30).	Followed Dam Break Analysis and Disaster Management Plan are part of EIA. The plan is available in the EIA. Emergency Preparedness plan for the Down stream is being prepared by the JFPR consultant for the operation phase. Dam Break analysis although carried out during the EIA will be updated based on the detail engineering design through IIT Roorkey. Aquatic ecology study will be carried out by College of Fisheries, Raha, Nagaon. Scope of the study in the Annexure 25. The College of Fisheries, RAHA is also appointed for the downstream impact backwater assessment, but the modelling part will be done by One Eco modeller in consultation with the college of Fisheries.
9	Environmental pollution	Escape of polluting materials	• Transformers designed with oil spill containment systems, and purpose-built oil, lubricant and fuel storage system, complete with spill cleanup equipment • Construct 110% fenced and bermed area with impermeable concrete floor.	Designed and implemented for the construction power substation. Bermed constructed in substation.

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
			• Powerhouses/substations to include drainage and sewage disposal systems (septic tanks, sewage treatment plant) to avoid offsite land and water pollution.	
10	Contamination of receptors (land, water)	Equipment submerged under flood	Powerhouses/substations constructed above the high flood level (HFL) i.e. 185.34 m, by raising the foundation pad. This level also includes any possible effects from future climate change.	Designed and implemented for construction power and will be implemented for evacuation substation.   Switchyard is under construction
11	Natural disaster frequently observed	Ground subsidence/ landslide	Civil design and sitting of project facilities has been done with due considerations to earthquake and landslide so as to avoid any hazard.	Designed and implemented

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
12	Fire hazards	Explosions/fire	• Design of Powerhouses/ substations has included modern fire control systems/firewalls in accordance with the norms of National Fire Protection Association (NFPA) and Tariff Advisory Committee (TAC). • Provision of fire fighting equipment to be located within 20 m of transformers, power generation equipment. • Fire protection and Safety practice have been prepared (Annex 28, 29).	Designed and implemented. All the measures were taken into consideration during the pre construction and design.
13	Tree cutting	Cutting of trees during site clearance	• Restricting tree cutting within construction limit. • Avoiding tree cutting at ancillary sites. • Providing and maintaining compensatory tree plantation i.e. three times of cutting. • Compensatory afforestation plan prepared.	Planned and under implementation. Bare minimum trees were removed when it was absolutely necessary. Tree cutting were done under the supervision of Forest Department of both the divisions. Compensatory afforestation plan prepared by the Forest Department and the cost for implementation was deposited to CAMPA account by APGCL. Preparation of nursery started in Dima Hasao in 5 Reserved Forest. CA for Dima Hasao district in Harmen range through establishment of five nurseries have been initiated at locations namely: (i) Wayungdisa RF; (ii) Tartelangso RF; (iii) Bagha Dima RF; (iv) Choto Longku RF; and (v) Bagha Dima RF, including site selection, preparation of the beds, seed collection, clearance of weeds etc. Seedling of different sizes in the newly established nursery

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
				nearby the village TorteLangsu Seedling of different sizes ready for plantation, Longku near the highway around the Forest office.   Nursery developed
14	Removal of vegetative covers (dust, pollution)		• Use of controlled clearing activities • Use of dust controlled measures • Collection and disposal of debris and muck.	Planned and being implemented. (CP-1, CP-2, CP-3, CP-4)
15	Removal of utilities		• Necessary planning and coordination with concerned authority and local body. • Prior notice to and consultation with concerned authority, local body and public to be affected so as to ensure that work does not get affected and impact on public is minimum.	Shifting of utility is not required so far.
16	Religious places	Work site	• Suitable mitigation measures have been incorporated in social impact assessment report.	Reported in SSMR.

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
17	Camp site and contractor facilities	Establishment of contractors' facilities	• Obtain permits and NOCs from ASPBC and other statutory agencies. • Contractor to submit a camp and site office plan defining all facilities to be created. These include human waste disposal facilities and solid waste management facilities. The basic plans provided in Annex 17) to be updated and finalized by contractor.	Office site plan approved by PMC and APGCL. Site EMP submitted by Package 2, 3 contractors and approved by APGCL after review of Environment cell of APGCL & PMC. Additional Plans like Influx management plan, revised Solid waste Management Plan etc incorporated by Package 2 contractor. Construction EMP approved by APGCL. Solid waste Management Plan submitted to APGCL by Package 2 contractor and final design of the landfill site under preparation. CEMP of CP-1,2,3 and 4 submitted. And approved by APGCL.. All the toilets have the septic tanks and potable water are connected to all the toilets.  Toilets of CP-2 contractor  Toilets of CP3 contractor with septic tank. Drinking water was supplied from the RO Plant.

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
				 Waste segregation at source
18	Project facilities and commencement of construction	Clearances and permits	• Obtain environmental clearance from MoEF&CC • Obtain forest clearance from forest departments • Include EMP in the contract documents.	Obtained EC and FC. EMP included in the Contract document.
CONSTRUCTION PHASE				
1.	Impact and air, water, noise, soil	Civil construction work for power house, tunnel, office, substation, access roads, colony etc.	**Air Pollution**: • All the vehicles must have valid PUC certificates at all the time during construction phase of the project. • Water sprinkling shall be done to suppress the dust emissions from the site. • All the DG sets used for construction shall have valid consents from Assam State Pollution Control Board and shall have built-in stacks to reduce the air emission impacts. • Refer to Annex 24: Measures for Air Pollution Control. Control of Emission • The contractor will be responsible for maintaining properly functioning construction equipment to minimize exhaust. • Construction equipment and vehicles will be turned	PUC monitored for vehicles time to time. (CP-1, CP-2, CP-3, CP-4). Copy of attached in the report.  Water sprinkling -Being mostly complied. CTO for DG sets available.

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
			off when not used for extended periods of time. • Unnecessary idling of construction vehicles to be prohibited. • Effective traffic management to be undertaken to avoid significant delays in and around the project area. • Road damage caused by sub-project activities will be promptly attended to with proper road repair and maintenance work. DG sets : • Location of DG sets and other emission generating equipment should be decided to keep in view the predominant wind direction so that emissions do not effect nearby residential areas. • Stack height of DG sets to be kept in accordance with CPCB norms. Dust Control : • Identification of construction limits (minimal area required for construction activities). • When practical, excavated spoils will be removed as the contractor proceeds along the length of the activity. • When necessary, stockpiling of excavated material will be covered or stacked at offsite location with muck	Stack height of DG sets are maintained as per norms i.e, 15 ft for 250 KVA. Complied Not initiated by the contractor as excavated materials are stockpiled in temporary storage areas far

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
			being delivered as needed during the course of construction. • Excessive soil on paved areas will be sprayed (wet) and/or swept and unpaved areas will be sprayed and/or mulched. • Contractors will be required to cover stockpiled soils and trucks hauling soil, sand, and other loose materials. • Clean the wheels of vehicles leaving the site to control the mud spread onto the public road. • Contractor shall ensure that there is effective traffic management at site. • Dust Suppression – The roads, construction area and vicinity (access roads, and working areas) shall be swept, sprinkled with water on daily basis to suppress dust.	away from the human habitation for backfilling particularly in the surge shaft, penstock, valve house and powerhouse areas. Partially complied. Not initiated. Contractor was instructed to cover the trucks carrying loose materials. Complied Complied Complied   Regular vehicle cleaning to reduce dust pollution (CP-2)

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
			Noise Pollution: • Construction materials shall be properly maintained and noise barriers, if needed, shall be provided around worksites, to reduce the noise levels. Design of such barriers will be finalized by CSC environment specialist. • All the workers will be provided with personal protective equipment including ear plugs and other necessary provisions by the contractor. • Refer to Annex 25: Measures for Noise Pollution Control	• DG sets has acoustic enclosures to prevent noise. Workers are using ear plug at drilling and blast sites along with other safety equipment. • PPE- mostly complied. PPE kits are used 98 %. Use of hand gloves 100 %. Use of proper ear muffler/ plug - 50%. Use oh Jackets, helmet and safety shoes-100 %. 
			Water Quality: • Quality of water (river and wastewater discharged from the construction site) shall be analyzed monthly during construction, for its compliance to the disposal standards of pollution control authority. • Refer to Annex 26: Measures for Water Pollution Control	Waste water generation from the construction site monitored. Waste water from labour camp are disposed through natural depression pond adjacent to the colony and the water is percolated through the boulder bed (placed by the contractor) for oxidation and the overflow is disinfected before reaching the receiving body. Grey water from the camp do not go through the septic tank But all the toilets are connected with Septic Tank. Wastewater from all kitchens, bathing areas, washing areas were diverted to the settling tanks prior to releasing in the environment. Still there are instances for direct release of wastewater. CP2 contractor has ordered DRDO approved biodigester septic tanks for

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
				treatment of wastewater before release into the environment. Monitoring of water quality after treatment and that of the receiving water body are monitored regularly from the reporting period July to Dec, 2023 and reported in this SEMR. Sedimentation tank constructed in the Dam Batching Plant area so that the cement slurry can be removed and the remaining water can be released after complying the standards. 
	Exposure to safety related risks		**Others**: • Proper plantation all around colony. Refer to Annex 21: Green Belt Development Plan • Drainage with the silting chamber, will be provide all around power house, office, substation and colony. • Solid waste storage bean system will be provided at required location. Refer to Annex 22: Solid Waste Management Plan	Plantation initiated as per green belt development plan in some areas.  On occasion of 15th Aug 120 Lower Kopili project Team planted 255 no. sapling under Project in Green hand initiative at dam top location.  Plantation by APGCL Director during Lower Kopili site visit at dam top location. Sept 23

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
				 Drainage provided in the substation and camp area but outlet and desilting chambers to be constructed. Dust bins kept at different sites  Waste are segregated designated bins at source and then biodegradable waste are taken to composting area and recyclable wastes are sent to vendors partially. A secured land fill site is being constructed as per rules and following the IFC Health and Safety guidelines. (CP-2, CP-3) All the building designs are constructed as per seismic zone provision.  Safety systems are provided at site.
			• All buildings designed constructed as per seismic zone provision. • Safety system will be provided at required location. Refer to Annex 18, Annex 28, Annex 29 for Occupational, Health and Safety Plans.	

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
				 CP-3 camp. Electric panel covered.  Compliance of EIA Annexure 20 of EIA. Structural condition of buildings/ properties likely to be impacted will be recorded to act as baseline and vibration monitoring is conducted regularly at all blasting and surrounding sites as per relevant Indian Standard/ codes, such as IS-14881:2001 and statutes and results will be incorporated in next EMRs. The ambulances with appropriate and essential lifesaving medical facilities are stationed at 2 critical construction sites by the contractors.  The first aid kits at all sites have all unexpired medicines and medical items are in adequate

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
				quantity related to the work force at site. The back up alarms and reverse blinkers of all construction vehicles are functional. The sturdy and stable barricading is provided around all deep excavated areas.  Hard Barricading and Proper access and Egress (CP-2)
2.	Infrastructure provisions at labor camps	Health and hygiene at workers camps	• Contractor during the progress of work will provide, erect and maintain necessary living. • Accommodation and ancillary facilities for labor as per the requirements of applicable labor regulations of Government of India. • All the work sites and camp sites shall also be provided with basic sanitation and infrastructure as per the requirements of Building and other Construction Workers (regulation of Employment and Conditions of Service) Act, 1996. • Refer to Annex 12: Public Health Delivery System • Refer to Annex 18: Project Personnel Health Plan • Refer to Annex 28: Fire Protection in Labor Camps and Staff Colonies • Refer to Annex 29: Safety Practices during Construction	Housekeeping and Hygiene at workers camps and bathrooms/toilets to be improved. Accommodation facilities have proper celling to control heat. (CP-2) Celling were placed in all accommodations to reduce heat. Drainage facilities to be constructed/ completed at camps and facilities. Camp sites also be provided with basic sanitation and infrastructure as per the requirements of Building and other Construction Workers. (CP-2)
	Fire Protection in Labor Camp	• Safety Practices	• Safety Practices During Construction Phase	Fire extinguishers are placed at vulnerable sites.

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
	and Staff Colonies	During Construction Phase	• Refer to Annex 28: Fire Protection in Labor Camps and Staff Colonies	Status of Fire Extinguisher at Project sites (Table 33).  Water hydrant at Magazine
3.	Solid Waste Management	Construction camps	• Collection and disposal of human waste as per waste management plan. • Refer to Annex 22: Solid Waste Management Plan	Solid waste disposal mechanism is only dumping in a pit. MSW management plan is being developed. Umrangsoo Town Committee gave permission for disposal of solid wastes after segregation at their site in CP-2, CP-1, CP-3.
4.	Muck disposal	Tunneling and excavation activities	• Muck generated from various tunnelling and excavation activities would be dumped suitably to designated sites • Refer to Annex 13: Muck Disposal Plan	4 muck dumping sites identified and currently all the 4 are being used. Muck disposal plan approved by APGCL. Requested the contractor to immediately replant the slope up with grass to prevent soil erosion and replacement trees to compensate for numbers that were lost due to muck disposal. For levelling of the road 70% of the materials were used and the usable stones were taken to crusher plant. Rest are at site. Contractor will collect the remaining materials to the dumping yard and left over materials after compaction will be revegetated. Quantity of muck generated, reuse and disposed at muck dumping site and slope achieved are being maintained by the contractor.
5.	Construction sites	Restoration of sites	• Restoration of construction sites.	Not yet arises.

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
			• Refer Annex 19: Construction Site Restoration Plan.	
6.	Noise and vibrations	Equipment layout and installation	• Construction techniques and machinery selection seeking to minimize ground disturbance. • Refer to Annex 25: Measures for Noise Pollution Control	Being partially complied. Construction activities done in barren areas only and on acquired land. Document related to the construction methodology and machine specification prepared and submitted for each activity. Vibration monitoring of the blasting activities were done from March 2023 onwards. 
7.	Disturbed farming activity	Physical construction	• Construction activities on cropping land time to avoid disturbance of field crops (within 1 month of harvest wherever possible).	Being complied.
8.	Noise vibration and operator safety, efficient operation, equipment wear and tear	Mechanized construction	• Construction Mechanized maintenance and turning of plant. • Proper maintenance and turning of plant • Implement environmental mitigation and good-construction as integral component of each civil activity and as day-to-day activity	Being complied and monitored.  Multi Disciplinary Committee was constituted to monitor the implementation of EMP. 3rd Meeting of the MDC was conducted at Site on 11.12.23

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
9.	Increase in airborne dust particles	Construction of access roads	• Existing roads and tracks used for construction and maintenance access to the site wherever possible. • Refer to Annex 24: Measures for Air Pollution Control	Being mostly complied. Water sprinkling to reduce dust. (CP-2)  Laying of bitumen on internal roads completed. 
10.	Increased land requirement for temporary accessibility	Construction of access roads	• New access ways restricted to a single /intermediate carriageway width. Refer to Annex 20: Road Construction Management Plan	Being complied. Permanent and temporary roads were constructed as per plan approved. As per EMP roads under EIA 2018.
11.	Temporary blockage of utilities	Construction work	Temporary placement of fill in drains/canals not permitted	Being complied. Whenever observed, immediately cleared.
12.	Loss of vegetative cover	Site clearance	Marking of vegetation to be removed prior to clearance, and strict control on clearing activities to ensure minimal clearance.	Being complied. Tree cutting are done in presence of Forest Department only after enumeration and recording. Tree marking & cutting at Power house area in presence of Panimure Forest Deparment Team.
13.	Fire hazards	Trimming/cutting of trees	• Trees allowed growing up to a specified height within the work areas by maintaining adequate clearance between the top of tree and the conductor as per the regulations.	Will be complied.

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
14.	Loss of vegetation and deforestation		• Trees that can survive pruning to comply should be pruned instead of cleared. • Felled trees and other cleared or pruned vegetation to be disposed of as authorized by the statutory bodies.	Being complied.
	Loss of vegetation and deforestation	Reservoir clearing	• Removal of maximum commercially viable timber. • All remaining timber, after commercial and salvage logging operations have been completed, will be cut as necessary and burnt. • Avoid removing stumps, as disturbed soil may release far more nutrients in water.	Will be complied.
15.	Loss of vegetation and deforestation	Wood/vegetation harvesting	• Construction workers prohibited from harvesting wood in the project area during their employment, (apart from locally employed staff continuing current legal activities). • Contractor should arrange LPG gas for cooking of food for their workers. • Refer to Annex 17: Plan for Construction Camp Management	Fire wood collection not allowed. LPG are used for cooking. In few cases induction stoves are used.(CP-2, CP-3) CP-1 – Firewood was used by some labour in the camp for cooking. Contractor was instructed to provide Gas immediately.
16	Loss of Biodiversity, Disturbance / accidents/ injury, to wildlife and avian fauna	Construction and clearing of forest areas	• Implementation of Compensatory afforestation plan. • Creation of a greenbelt around the perimeter of various project appurtenances, selected stretches along reservoir periphery, access roads to compensate for the loss of habitat • Provisions of adequate signages and speed limit on road sections within forest areas to avoid accidental road kills.	5 nurseries created by the Forest Department in Dima Hasao. • Not yet initiated. • Signages placed in the forest area to reduce the speed limit.

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
			• Poaching activities should be monitored in workers areas and well as community areas (as per Annex 9). • Implementation of Biodiversity Conservation and Management Plan (Annex 9) • Compliance with guidelines issued by the National Wildlife Board of India for linear intrusion in natural area pertaining to roads and power lines. • Compliance with guidelines issued by the Central Electricity Authority (CEA) for laying transmission lines in areas critical from the point of view of saving wildlife. • Provision of wild fruit plantation for wildlife • Annual bird count of migratory birds by involving locals and bird experts • Rehabilitation with local fruit bearing species in gaps • Anti-grazing drive in drawdown area to protect the bird breeding areas in proximity to reservoir during breeding season – only in winter season. Grazing by local people will be allowed during dry season.	 • Poaching activities monitored in labour camps and awareness carried out among the workers on 25.08.23; 09.09.23 and on 15.12.23. (Attendance sheet in annexure 24) Awareness Program conducted regarding critical Indigenous species around project area. • BMP 3 meetings were conducted with the Forest Department on 12.12.23.  Plantation initiated. • NABL clearance not taken as there is no WLS in 10 km radius. • CEA guideline complied during construction of transmission line. • Wild fruit plantation initiated. • Annual Bird count not initiated. Discussion completed with AARANYAK to carry out the study. Annual bird count will be initiated in the winter months with support of forest department.

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
			• Construction of check posts / watch towers in key locations • Conservation actions as proposed by IUCN (during construction and during the initial project operation) such as conducting a comprehensive survey and monitoring in and around the project area to establish range, distribution and population status of vulnerable and critical habitats in the project area for assessing its habitat requirements and identifying threats are proposed. • Establishment of biodiversity conservation committee. • Refer to Annex 9: Biodiversity Conservation and management Plan • Refer to Annex 21: Green Belt Development Plan	• Rehabilitation with local fruit bearing species in gaps not initiated. • Anti-grazing drive in drawdown area to protect the bird breeding areas in proximity to reservoir – not initiated. • Construction of check posts – not initiated • Implementation of Conservation action plan – initiated. A comprehensive survey was carried out by EMC in the month of April and May, 2023. Terrestrial Monitoring will be initiated after installation of camera traps. • Biodiversity conservation committee – constituted. Discussion with forest department going on for the implementation for BMP. 1st meeting of BMP was done on 21.12.22, the 2nd meeting was held on 27.06.2023 and 3rd meeting was held on 12.12.23.
17.	Runoff to cause water pollution, solid waste disposal	Surplus earth work/soil	• Excess fill from excavations disposed of next to roads or on barren land or personal in agreement with the local community or land owner. • Soil excavated from power houses will be disposed as safe & scientific manner by placement on barren land or	• Does not arise as entire land is acquired for the project including the dumping area. • Will be adhered. • Material has been stocked as backfilling will be required in the Power House.

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
			along back fill trench weir etc.	• Slope protection measures are taken up as per approved designs in powerhouse area.  Slope protection in power House area.
18.	Loss of soil and water pollution	Substation construction	• Fill for the substation foundation obtained by creating or improving local water supply ponds or drains, with the agreement of local communities. • Construction activities involving significant ground disturbance (i.e., substation land forming) not undertaken during the monsoon season.	• Does not arise. • Followed during construction of construction power substation.
19.	Contamination of receptors (land, water, air)	Storage of chemicals and materials	• Fuel and other hazardous materials securely stored above high flood level with safety measures. • Refer to Annex 18: Project Personnel Health Plan	Mostly followed for fuel. Fuel dispensing unit approval received. (CP-2) All Hazardous chemicals are stored on concrete floor with tarpaulin cover shade.  20KL petrol pump station is established. For hazardous chemical materials stores constructed.
20.	Noise nuisance	Construction schedules	During work near settlements construction activities only undertaken during the day and local communities will be	Construction scheduled for day only in the revenue land near villages. Construction during night are done in the areas away from the human habitation.

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
			informed of the construction schedule.	Local people were informed about the daily construction schedule and the blasting timings. Sign boards were also installed with the blasting timings.
21.	Contamination of receptors (land, water, air)	Provision of facilities for construction workers	• Construction workforce will be provided for certain facilities it includes proper sanitation, water supply and waste disposal facilities. • Refer to Annex 17: Construction Camp Management Plan	Housekeeping and Hygiene at workers camps and bathrooms/toilets to be improved. Drainage facilities to be constructed/completed at camps and facilities. Sedimentation tanks constructed near Tunnel in the adit (CP-2). Sedimentation tank also constructed in near the batching plant (Dam). Deposited sediments are regularly cleared from the tanks and disposed in the designated dumping site. Water quality is periodically checked and released to the natural drains (if the quality meets the standards).  Municipal Solid Waste Management facility developed.  6 no compost pit were filled and another 6 pit excavated. (CP-2)

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
22.	Loss of agricultural productivity	Encroachment into agricultural land	• Use of existing roads wherever possible. • Ensure existing irrigation facilities are maintained in working condition. • Protect/Preserve topsoil and reinstate after construction completed. • Repair/reinstate damaged bunds, etc. after construction completed	- Followed. - Does not arise so far. - Top soils were preserved and used by CP-2. Top soil preservation not initiated by CP-4. Instructed to contractor (CP-4) to adhere.  - Will be followed if bunds are damaged.
23.	Social inequities	Encroachment into agricultural land	Compensation for temporary loss in agricultural production as per provisions of Resettlement and Tribal Development Plan	Followed
24.	Soil loss, downstream siltation; etc.	Uncontrolled erosion/silt runoff	• Need for access tracks minimised, use of existing roads. • Limit site clearing to work areas regeneration of vegetation to stabilize works areas on completion (where applicable). • Avoidance of excavation in wet seasons. • Water courses protected from siltation through use of bunds and sediment ponds. Refer to Annex 26: Water Pollution Control Measures	- Followed - Site clearing is done where necessary. - Excavations are avoided during wet season. - Water courses will be protected from siltation through use of bunds and sediment ponds. - Bund were prepared for construction of culverts. Compliance of water pollution control measures : Sewage from labour camp / colonies are treated through settling tank and aerated lagoon. All the toilets are connected with septic tanks. Effluent from tunneling sites and batching plants are processed through the settling tanks. Suspended solids collected in the settling tanks were disposed in

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
				the designated site in the dumping yard. Periodically the water quality are tested by PCBA approved agency.
25.	Losses to neighbouring land uses/values	Nuisance to nearby properties.	• Contract clauses specifying careful construction practices on every stage. • Maximum existing access ways will be used. • Productive land will be reinstated following completion of construction.	- Followed. - Existing access roads are mostly used. - Productive land will be reinstated following completion of construction.
26.	Social inequities	Nuisance to nearby properties.	Compensation will be paid for loss of production, if any as per provisions of Resettlement and Tribal Development Plan	Being followed.
27.	Flooding and loss of soils, contamination of receptors (land, water)	Flooding hazards due to construction impediments of natural drainage.	• Avoid natural drainage pattern/ facilities being disturbed/ blocked/ diverted by ongoing construction activities. Refer to Annex 30: Dam Break Analysis And Disaster Management Plan	Natural drainages are not blocked through any kind of construction activity.
28.	Contamination of receptors (land, water)	Equipment submerged under flood	Equipment stored at secure place above the high flood level (HFL) i.e. 185.34 m.	Complied. Storage facility are above the HFL.
29.	Loss of land values	Inadequate siting of borrow areas	Existing sites (if available) will be used, therefore, no need to develop new sources of aggregates.	Aggregates are used from the excavated materials. For use of existing quarries fresh permissions are required like EC. Permission taken from NCHAC for aggregate quarry and later EC was also accorded for the quarry. Fine aggregates are used from the crusher dust. (CP-2) 

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
				CP-1 and CP-3 are using minor minerals from approved sources.
30.	Injury and sickness of workers and members of the public.	Environment, Health and safety	• Arrangement of Environment awareness programme. • Contract provisions specifying minimum requirements for construction camps. • Preparation and implementation of health and safety plan. • Arrangement of primary health centre with medicine and instrument with a knowledgeable health staff. • Arrangement for health and safety training sessions. • Refer to Annex 12: Public Health Delivery System • Annex 16: Plan for Environmental Training of Workers	• Arrangement of Environment awareness programme initiated. • Followed. • Health and safety plan prepared and implementation is ongoing. • Primary health centre constructed with trained health staff. • Health camps are being organised by the contractor for the community people. (CP-2, CP3, CP-1)  Health camp CP-1   HIV/AIDS awareness training program conducted by CP-3 contractors. CP-3. Oct 2023 • Anti malarial measures taken by the contractor for the labours.

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
				 • Health Facilities at Construction sites and labor camp established • For implementation of Public Health Delivery system discussion with respective departments will be initiated soon. • Health and safety training conducted by CP-1, CP-2, CP-3 & CP-4. • Training were also given to the subcontractor personals. • PMC and PMU also arranged Health and Safety trainings. • Sample First Aid Box.  Monthly Environment Health and Safety Meeting conducted 

Sl.	Environmental Issue	Activity/ Location	Mitigation Measures	Compliance as on 31st Dec 2023
				General Environmental Awareness Training for workmen  Project Manager Executive EHS tour conducted at workmen camp CP-2 .Sept 23  L&T Safety Day and Celebrating Mr. Henning Holck-Larsen's Birthday 4th July 2023 at each working location (Dam, Powerhouse, Switchyard)
31.	Likely to maximize damages	Inadequate construction stages monitoring.	• Training to personal of implementing agency for environmental monitoring work. • Implementation of effective environmental monitoring and reporting system using checklist of all contractual environmental requirement. • Appropriate contact clauses to ensure satisfactory implementation of contractual environmental mitigation measures.	• Informal Trainings are conducted by the PMC and PIU regularly. • PMC and PIU carried out formal training on EHS and implementation of EMP on 07.12.23. • Check list prepared and implementation monitored. • Letters issued to the contractor on the contractual obligations of noncompliance and this will be continued.
OPERATION PHASE				***Operation phase monitoring will be carried out during operation.***

6.1 Action Taken on the corrective actions on compliances to EMP are shown in Table 8.

Table 8: Corrective Actions taken till 31st December 2023

ACTION TAKEN REPORT on the Corrective Action Plan

7.0 Environmental Supervision and Monitoring Results

7.1 Environmental Supervision

Site inspections and audits completed during the reporting period July to December 2024. 12 nos of site inspection of all the components (Pkg.1, Pkg.2, Pkg.3, Pkg.4) were carried out. Day to day monitoring on EHS were carried out by site staffs of PMC and APGCL and reported to Environment Safeguard team of PMC and APGCL. Joint Site inspections were carried out on the following dates during July to December, 2024.

Month	Dates	
July	3	20
August	7	19
September	9	29
October	3	19
November	2	16
December	1	20

7.2 Quantitative Environmental Monitoring

Monitoring : Test of ambient environment of Air, Water, Noise in all the 8 locations were carried out in the month of March 2022. Test results are within the CPCB standards except for Kopili river water quality (Noise Table 9, 10, 11,12), (Ambient Air Table 13, 14, 15, 16, 17), (Ground water Table 18, 19, 20), (Surface water Table 22, 23, 24), RO Water Table 25, Waste Water Table 26, RO water Monitoring Table 27, (Soil Table 28, 29, 30), analysis of monitoring results Table 31. All test reports are in Noise Monitoring in Annexure 12, Air quality Monitoring in Annexure 13, Surface water Quality in Annexure 14, Ground water Quality in Annexure 15, RO water quality in Annexure 16, Waste water quality in Annexure 17, Soil testing results in Annexure 18 and DG stack monitoring results in Annexure 19.

Noise Monitoring Results (table 9, 10,11)
(Test Results are in Annexure 12)

Table 9. Noise Monitoring CP-1

CPCB Standard Limit	[dB (A)		WHO standard limit		Monitoring Dates	Day/ Night	Permanent Colony
	Day 6AM-10 PM	Night 10AM-6PM	Day 6AM-10 PM	Night 10AM-6PM			
Industrial Area	75	70	70	70	Aug-23	Day	57.2
Commercial Area	65	55				Night	40.6
Residential Area	55	45	55	45			
Silence Zone	50	40	CPCB more stringent				

(Monitoring Dates 31.08.2023)
Sampling Location : Lat 25°88'03.52" N; Long 92°80'49.47"E

Table 10. Noise Test Results CP-2

CPCB Standard Limit [dB (A) Leq]			WHO standard limit		Monitoring Dates	Day/ Night	Power Inlet / Dam site	Crusher site	Adit to HRT	Batching Plant	Surge Shaft Site	Labour and Staff Camp	Power House	Primary School/ Hospital near APGCL
	Day 6AM-10 PM	Night 10AM-6PM	Day 6AM-10 PM	Night 10AM-6PM										
Industrial Area	75	70	70	70	Jul-21		48.1	51.2	50	45.2	44.6	51.2	47.2	55.2
Commercial Area	65	55			Oct-21		52.1	51.4	47.6	46.4	59.0	50.0	47.5	59.2
Residential Area	55	45	55	45	Dec-21		48.1	51.2	48.6	45.2	44.6	51.2	47.2	55.2
Silence Zone	50	40	CPCB more stringent		Mar-22		48.3	55.3	51.2	50.3	47.2	51.2	55.2	56.1
					Sep-22	Day	47.3	57.2	52.4	50.9	49.2	53.5	54.3	55.7
						Night	38.6	44.2	40.3	44.5	37.3	44.7	42.8	40.8
					Feb-23	Day	48.2	56.3	53.7	52.3	50.2	54.9	55.7	57.2
						Night	37.2	45.6	41.3	47.2	38.4	46.7	43.8	41.7
					Nov-23	Day	49.6	64.6	56.1	65.5	49.2	52.9	61.2	53.6
						Night	37.1	50.7	45.7	53.4	35.9	50.7	51.2	42.9

(Noise Monitoring Sampling Dates 28th Nov to 5th Dec, 2023)

Note : Ambient noise level near Hospital and Primary school is higher as both the institutions are on the NH 627.

Table 11. Noise Test Results CP-3

(Noise Sampling 26-28 August, 2023)

(No area falls under Residential or Silence area)

CPCB Standard Limit [dB (A) Leq]			WHO standard limit		Monitoring	Day/ Night	Near Service Bay	Near Valve House	Near Project Camp
	Day 6AM-10 PM	Night 10AM-6PM	Day 6AM-10 PM	Night 10AM-6PM					
Industrial Area	75	70	70	70	Dates		26.08.23	27.08.23	28.08.23
Commercial Area	65	55			Aug-23	Day	60.9	57.2	58.3
Residential Area	55	45	55	45		Night	47.9	42.9	46.7
Silence Zone	50	40	CPCB more stringent						

Note : The increase in the ambient noise value during night may be due to movement of the heavy vehicles.

Table 12. Noise Test Results CP-4

(Sampling 23rd to 31st December, 2023)

CPCB Standard Limit [dB (A)			WHO standard		Monitoring	Day/ Night	AP 1/0	Near 87/0	58/0	37/1	Near Lalungdubi Gaon
	Day 6AM-10 PM	Night 10AM-6PM	Day 6AM-10 PM	Night 10AM-6PM							
Industrial Area	75	70	70	70	Dates		24.12.23	24.12.23	24.12.23	31.12.23	23.12.23
Commercial Area	65	55			Dec-23	Day	59.2	42.2	43.3	42.1	39.2
Residential Area	55	45	55	45		Night	47.8	34.1	37.5	36.3	34.7
Silence Zone	50	40	CPCB more stringent								

Noise Monitoring CP-2

7.2.A. Ambient Air Quality Monitoring Results (Monitoring results in Annexure 13)

Table 13. Ambient Air quality Monitoring Results of CP-1

Monitoring Dates	Parameters	CPCB Standard	WHO/ WB/ IFC	Permanent Colony
Aug-23	PM 10	100	50	40.5
	PM 2.5	60	25	31
	NO2	80		16.7
	CO	2		BDL
	HC	1		BDL
	SO2	80	20	9.5

(Air quality Monitoring Dates 23.08.2023 to 25.08.2023)
Sampling Location : Lat 25°88'03.52" N; Long 92°80'49.47"E

Table 14. Ambient Air Quality Monitoring results of CP2

Parameter	Unit	CPCB Standard Limit	WHO/ WB/ IFC standard	Monitoring Dates	Dam site	Crusher site	HRT Adit	Batching Plant	Surge Shaft Site	Labour and Staff Camp	Swith yard / Valve House	APGCL near Hospital/ High	Power House	Quarry site
PM 10	(µg/m³)	100		Jul-21					34.3	27.6		33.1		
PM 2.5	(µg/m³)	60							17.5	17.1		19.1		
NO2	(µg/m³)	80							10.1	10.2		9.2		
CO	(mg/m³)	2							BDL	BDL		0.03		
HC	(mg/m³)	1							BDL	BDL		0.01		
PM 10	(µg/m³)	100		Oct-21	30.6	38	34.7		35.8	28.9	34.9	34.2	36.5	39.4
PM 2.5	(µg/m³)	60			18.9	20.5	19		19.3	17.7	18	18.8	19.2	21.6
NO2	(µg/m³)	80			10.6	12.7	11.4		11.9	10.2	8.6	10.9	10.8	12
CO	(mg/m³)	2			BDL	BDL	BDL		BDL	BDL	BDL	0.04	BDL	BDL
HC	(mg/m³)	1			BDL	BDL	BDL		BDL	BDL	BDL	0.03	BDL	BDL
PM 10	(µg/m³)	100		Dec-21	31.3	37	39.3	32.3	36.7	29.8	36.1	35.6		
PM 2.5	(µg/m³)	60			17.1	21.3	19.4	18.6	19.5	16.3	19.2	19.2		
NO2	(µg/m³)	80			11.2	13.2	12.5	12.3	12.8	11.4	8.7	11.6		
CO	(mg/m³)	2			BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.03		
HC	(mg/m³)	1			BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.02		
PM 10	(µg/m³)	100	50	Mar-22	33.1	38.1	39.1	35.6	37.3	30.2	37.1	34.2		
PM 2.5	(µg/m³)	60	25		17.1	21.3	19.4	18.6	19.5	16.3	19.2	19.2		
NO2	(µg/m³)	80	NA		11.2	13.2	12.5	12.3	12.8	11.4	8.7	11.6		
CO	(mg/m³)	2			BDL	0.04	BDL	BDL	BDL	BDL	BDL	BDL		
HC	(mg/m³)					0.03	BDL	BDL	BDL	BDL	BDL	BDL		
PM 10	(µg/m³)	100	50	Sep-22	32.3	40.3	36.2	31.6	30.7	32.6		30.7	34.6	
PM 2.5	(µg/m³)	60	25		18.6	26.1	19.2	21.5	16.2	15.7		18.6	18.8	
NO2	(µg/m³)	80	NA		13.8	15.6	10.8	14.8	12.2	11.3		10.6	10.2	
CO	(mg/m³)	2			BDL	0.03	BDL	BDL	BDL	BDL		BDL	BDL	
HC	(mg/m³)				BDL	0.04	BDL	BDL	BDL	BDL		BDL	BDL	
SO_2	(µg/m³)	80	20		9.2	11.8	8.3	10	9.2	7.8		8.7	7.4	
PM 10	(µg/m³)	100	50	Feb-23	34.2	45.2	37.4	34.7	35.2	34.3		33.1	34.2	
PM 2.5	(µg/m³)	60	25		18.6	29.5	19.2	20.7	20.1	20.3		22.1	21.6	
NO2	(µg/m³)	80	NA		14.5	17.7	12.2	15.9	13.2	12.4		11.7	9.8	
CO	(mg/m³)	2			BDL	0.03	BDL	BDL	BDL	BDL		BDL	BDL	
HC	(mg/m³)				BDL	0.02	BDL	BDL	BDL	BDL		BDL	BDL	
SO_2	(µg/m³)	80	20		10.1	12.2	9.2	11	9.5	8.2		8.1	8.1	
PM 10	(µg/m³)	100	50	Nov-23	36.2	52.7	35.2	35.2	30.3	35.7		30.7	36.7	
PM 2.5	(µg/m³)	60	25		24.5	30.7	17.9	25.7	24.7	20.1		21.5	24.6	
NO2	(µg/m³)	80	NA		15.6	18.6	12.1	15.8	14.7	13.6		11.6	11.7	
HC	(mg/m³)				BDL	0.03	BDL	BDL	BDL	BDL		BDL	BDL	
CO	(mg/m³)	2			BDL	0.06	BDL	BDL	BDL	BDL		BDL	BDL	
SO_2	(µg/m³)	80	20		10.9	12.9	9.2	9.8	11.6	9.7		10.6	9.8	

Note : The increase in the PM2.5 during November 2023 near stone crusher unit cannot be compared with WHO ambient air quality standard. The monitoring station is selected near the crusher unit to ensure the emission of particulate matter from the process to ensure the compliance standard as stipulated in the consent to operate. As per standard protocol sampling site was selected to monitor the particulate matters along with other parameters.

As per specification of EP rule at SL.37 of 1986 – The SPM shall be measured between 3 m and 10 m from any process equipment's of stone crusher units. The value of SPM shall not exceed 600 µg/m3. For SPM value is addition of PM 10 and PM 2.5.

(Air Quality Monitoring Sampling Dates 28th Nov to 5th Dec, 2023)

Table 15. DG Set stack monitoring

(Sampling 24th to 30th October, 2023)

Sl No.	DG Set	Particulate matter g/kwhr
1	40 KVA	0.028
2	125 KVA	0.017
3	180 KVA	0.016
4	250 KVA	0.018
5	500 KVA	0.019
6	1000 KVA	0.029

Ref : Emissions from new diesel, gas, and petrol engines used in generator sets have been regulated by the Ministry of Environment and Forests, Government of India. In 2016, the emission standards for diesel engines ≤ 800 kW were extended to gas engines and dual fuel engines.

Emission standards for diesel engines ≤ 800 kW for generator sets (2014)

Engine Power (P)	PM
P ≤ 19 kW	0.3
19 kW < P ≤ 75 kW	0.3
75 kW < P ≤ 800 kW	0.2

Table 16. CP-3: Ambient Air Quality Results

Parameters	Unit	CPCB Standard Limit (IS 5182)	WHO/ WB/ IFC standard	Near Service Bay	Near Valve House	Near Project Camp
Start Date				25.08.23	25.08.23	25.08.23
End Date				31.08.23	31.08.23	31.08.23
PM_{10}	(µg/m³)	100	50	38.9	39.7	37.9
$PM_{2.5}$	(µg/m³)	60	25	23.4	28.6	26.7
NO2	(µg/m³)	80	NA	13.9	14.6	13.4
HC	(mg/m³)			BDL	BDL	BDL
CO	(mg/m³)	2		BDL	BDL	BDL
SO_2	(µg/m³)	80	20	9.8	9.8	8.1

Table 17. CP-4: Ambient Air Quality Results

Monitoring Dates	Parameters	Unit	CPCB Standard Limit (IS 5182)	WHO/ WB/ IFC standard	Nera AP 1/0	Near 87/0	Near 58/0	Nera 37/1
	Start Date				26.12.23	26.12.23	26.12.23	26.12.23
	End Date				30.12.23	30.12.23	30.12.23	30.12.23
Dec-23	PM 10	(µg/m³)	100	50	92	86	95	91
	PM 2.5	(µg/m³)	60	25	48	54	56	53
	NO2	(µg/m³)	80	NA	28.3	27.5	28.3	24.9
	CO	(mg/m³)	2		0.3	0.22	0.29	0.25
	SO_2	(µg/m³)	80	20	7.96	9.16	8.59	10.28
	Ozone O_3	(µg/m³)	180		38	39	42	36
	Ammonia NH_3	(µg/m³)	400		46	51	37	35
	Lead Pb	(mg/m³)	1		BDL	BDL	BDL	BDL
	Niclek Ni	(ng/m³)	20		5.07	3.61	4.17	2.76
	Arsenic As	(ng/m³)	6		0.41	0.23	0.38	0.27
	Benzine C6H6	(µg/m³)	5		BDL	BDL	BDL	BDL
	Benzo (a)Pyrene (BaP)	(ng/m³)	1		BDL	BDL	BDL	BDL

Note : All the sites are near the road and human settlement. The increase in the PM10 and PM 2.5 are due to the activities by multiple stakeholders and hence the values are above the WHO standard limits.

(Monitoring dates : 23rd to 31st December, 2023)

Air Monitoring sample collection from all construction site locations (CP-2).

7.2.B. Ground Water Quality Monitoring Results

Table 18. Ground water results CP-1

CP-1- Sampling Date for 24th August, 2023.

Parameters	Units	Standard limits as per WHO Requirement	IS 10500:2012 Drinking	Aug-23 Borewell
pH value		6.5-8.5	6.5-8.5	**7.45**
Turbidity	NTU, Max	1	1	1.16
TDS	mg/l	No health-based guideline value is proposed	500	172
Total Hardness as CaCO3	mg/l		200	63.2
Calcium as Ca	mg/l		75	34.8
Magnesium as Mg	mg/l		30	14.5
Total Alkalinity as CaCO3	mg/l		200	114
Chloride as Cl	mg/l	200-300	250	14.3
Phosphate as PO4	mg/l			
Sulphate as SO4	mg/l	No health-based guideline value has been derived	200	9.2
Nitrates as NO3	mg/l	50	45	2.4
Conductivity	µs/cm			
Arsenic as As	mg/l	0.01	0.01	
Irons as Fe	mg/l	No health-based guideline value is proposed	0.3	0.245
Fluoride as F	mg/l	1.5	1	0.24
TSS	mg/l			
Oil & Grese	mg/l		0.5	
Salinity	mg/l			
Copper as Cu	mg/l	2	0.05	0.031
Cadmium as Cd	mg/l	0.003	0.003	BDL
Lead as Pb	mg/l	0.01	0.01	BDL
Zinc as Zn	mg/l	No health-based guideline value is proposed	5	0.23
Total Chromium	mg/l	0.05		BDL
Manganese	mg/l	0.4	0.1	0.034
Fecal Coliform	MPN/100ml		Shall not be detectable	
Total Coliforms Organisms MPN/100 ml	MPN/100ml		Shall not be detectable	
			CPCB standard	
DO	mg/l	No health-based guideline value is recommended	5	**8.4**
BOD (5 days 20^0 C)	mg/l		2-3	
COD	mg/l			

Acceptable limits for pH are between 6.5 to 8.5

Table 19. Ground water results CP-3

Parameters	**Units**	**Standard limits as per WHO Drinking Water Criteria (mg/L)**	IS 10500:2012 Drinking water Specification	Camp
		Requirement (Acceptable limit)		Borewell
pH value		6.5-8.5	6.5-8.5	6.68
Turbidity	NTU, Max	1	1	4.6
TDS	mg/l	No health-based guideline value is proposed	500	68.6
TSS	mg/l			81.2
Oil & Grese	mg/l		0.5	<5
DO	mg/l	No health-based guideline value is recommended	5	5.4
Total Hardness as CaCO3	mg/l		200	72.5
Calcium as Ca	mg/l		75	38.6
Magnesium as Mg	mg/l		30	22.4
Total Alkalinity as CaCO3	mg/l		200	35.4
Sulphate as SO4	mg/l	No health-based guideline value has been derived	200	26.2
Nitrates as NO3	mg/l	50	45	4.4
Phosphate as PO4	mg/l			<0.02
Salinity	%			0.2
Conductivity	µs/cm			81.3
Arsenic as As	mg/l	0.01	0.01	BDL
Irons as Fe	mg/l	No health-based guideline value is proposed	0.3	0.71
Total Coliforms Organisms MPN/100 ml	MPN/100ml		Shall not be detectable	2
Fecal Coliform	MPN/100ml		Shall not be detectable	Nil
BOD (5 days 20^0 C)	mg/l		2-3	4.2
COD	mg/l			61

Note : The value as observed in the borewell (for total coliforms) will be the source of drinking water. After treatment only the water will be used for drinking purpose. Meanwhile they are using packed drinking water as they have not obtained the CTO for the RO plants.

Table 20. Ground water results CP-4

Parameters	Units	Standard limits as per WHO Drinking Water Criteria (mg/L)	IS 10500:2012 Drinking water Specification	December, 2023				
		Requirement (Acceptable limit)		Lalungdubi Village	Near 37/1	Near 58/0	Near 87/0	Near AP 1/0
Sampling dates				23.12.23	23.12.23	23.12.23	23.12.23	23.12.23
				31.12.23	31.12.23	31.12.23	31.12.23	31.12.23
				Tube well	Tube well	Tube Well	Tube Well	Tube Well
Temperature	C			19.3	18.5	18.3	18.7	18.9
CaCO3	mg/l			Nil	Nil	Nil	Nil	Nil
Colour		5		3	2	2	3	2
Odour		Aggreable		Aggreable	Aggreable	Aggreable	Aggreable	Aggreable
Taste		Aggreable		Aggreable	Aggreable	Aggreable	Aggreable	Aggreable
pH value		6.5-8.5	6.5-8.5	7.21	7.1	7.13	7.13	7.15
Turbidity		1 Max		13	6.52	4.76	5.1	4.83
TDS		500 Max		252	172	98	112	96
Conductance		-		0.345	0.325	0.316	0.298	0.325
DO	mg/l	No health-based guideline value is recommended	5	5.6	4.8	5.2	6.2	5.8
BOD (5 days 20^0 C)	mg/l		2-3	3	1.6	1.8	1.6	1.8
COD	mg/l			10	8	7	6	5.6
Sodium Na	mg/l			6.18	5.13	6.52	4.82	3.76
Potassium	mg/l			5.22	2.16	3.1	2.64	3.1
Nitrate Nitrogen as N	mg/l			<0.02	<0.02	<0.02	<0.02	<0.02
Ammonium NH3-N	mg/l		0.5	<0.02	<0.02	<0.02	<0.02	<0.02
Boron as B	mg/l		0.5	<0.05	<0.05	<0.05	<0.05	<0.05
Total Coliform	MPN/100ml			17	11	7	13	15
Faecal Coliform	MPN/100ml			Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
Total Alkalinity as CaCO3	mg/l	200	200	182	136	118	98	86
Total Hardness as CaCO3	mg/l		200	136	116	84	106	92
Calcium as Ca	mg/l		75	42.12	52.32	38.72	32.26	26.58
Magnesium as Mg	mg/l		30	18.62	22.1	10.96	9.74	7.62
Sulphate as SO4	mg/l	No health-based guideline value has been derived	200	63	42	37	44	32.5
Nitrates as NO3	mg/l	50	45	5.73	4.19	2.86	3.16	2.86
Chloride as Cl	mg/l	200-300	250	70.24	31.5	29.2	33.8	29.3
Fluoride as F	mg/l	1.5	1	1.02	0.86	0.93	1.02	0.92

Note : The value as observed in the borewells (for Total Coliforms) are not used for drinking purpose by the contractor. They are using packed drinking water.

7.2.C. Surface Water quality

Table 21 : Surface Water Quality Monitoring Results CP-2

Sampling Date for 24th Nov to 5th Dec, 2023.

Parameters	Units	Standard limits as per WHO Drinking Water Criteria (mg/L)	IS 10500:2012 Drinking water Specification	1 km U/S of Dam, Kopili River	Dam site	1 km D/S of Dam, Kopili River	3 km D/S of Dam, Kopili River	8 km D/S of Dam, Kopili River	Langku Nala	Adit Pond
pH value		6.5-8.5	6.5-8.5	6.95	6.92	6.91	6.73	6.73	7.28	8.33
Turbidity	NTU, Max	1	1	1.5	2.8	2.8	2.1	2.5	1.1	1.2
TDS	mg/l	No health-based guideline value is proposed	500	76.8	114	82.7	36.4	21.6	67.5	96.1
TSS	mg/l			48.3	83.6	95.4	88.5	56.4	104.8	51.7
Oil & Grese	mg/l		0.5	<5	<5	<5	<5	<5	<5	<5
Total Hardness as CaCO3	mg/l		200	60	85.1	86.3	58	62.6	76	92.4
Calcium as Ca	mg/l		75	24.7	36.8	29.6	18.4	32.5	24.4	30.5
Magnesium as Mg	mg/l		30	13.5	19.4	18.1	8.7	16.8	13.6	14.7
Total Alkalinity as CaCO3	mg/l		200	36	27.6	58.5	36.1	106.9	95	60.8
Sulphate as SO4	mg/l	No health-based guideline value has been derived	200	27.2	10.4	28.2	27.5	21.2	26.2	20.6
Nitrates as NO3	mg/l	50	45	8.5	7.3	4.1	6.3	5.3	2.9	3.7
Phosphate as PO4	mg/l			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Salinity	mg/l			0.2	0.3	0.3	0.3	0.3	0.3	0.2
Conductivity	µs/cm			89.4	106.5	102.7	92.6	118.2	105	150
Arsenic as As	mg/l	0.01	0.01	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Irons as Fe	mg/l	No health-based guideline value is proposed	0.3	0.67	0.32	0.63	0.54	0.635	0.386	0.211
Fecal Coliform	MPN/100 ml		Shall not be detectable	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Total Coliforms Organisms MPN/100 ml	MPN/100 ml		Shall not be detectable	2	2	2	2	2	3	1
			CPCB standard							
DO	mg/l	No health-based guideline value is recommended	5	5.8	5.3	5.9	6.9	7.1	6.5	6.9
BOD (5 days 20^0 C)	mg/l		2-3	3.9	5.3	4.8	5.7	4.5	7.2	2.1
COD	mg/l			21	24	27	26	20.6	21	8.5

Kopili river water sample taken from 1 km U/S, Dam site, 3 km D/S, 8 Km D/S.

River Water pH monitoring in front of External Monitor- Aug 23

Table 22 : Surface Water Quality Monitoring Results CP-3

Parameters	**Units**	**Standard limits as per WHO Drinking Water Criteria (mg/L)**	IS 10500:2012 Drinking water Specification	Kopili River (Near Service Bay)	Kopili River (Near Valve House)
		Requirement (Acceptable limit)		River water	River water
pH value		6.5-8.5	6.5-8.5	6.42	6.62
Turbidity	NTU, Max	1	1	1.48	1.26
TDS	mg/l	No health-based guideline value is proposed	500	18.9	203
TSS	mg/l			74.12	92.4
Oil & Grese	mg/l		0.5	<5	<5
DO	mg/l	No health-based guideline value is recommended	5	4.5	5.4
Total Hardness as CaCO3	mg/l		200	53	53
Calcium as Ca	mg/l		75	21.3	27.2
Magnesium as Mg	mg/l		30	14	16.5
Total Alkalinity as CaCO3	mg/l		200	23	162
Sulphate as SO4	mg/l	No health-based guideline value has been derived	200	22.6	11.6
Nitrates as NO3	mg/l	50	45	6.1	6.4
Phosphate as PO4	mg/l			<0.02	<0.02
Salinity	%			0.2	0.3
Conductivity	µs/cm			86	220
Arsenic as As	mg/l	0.01	0.01	BDL	<0.001
Irons as Fe	mg/l	No health-based guideline value is proposed	0.3	0.92	0.94
Total Coliforms Organisms MPN/100 ml	MPN/100ml		Shall not be detectable	4	3
Fecal Coliform	MPN/100ml		Shall not be detectable	Nil	Nil
BOD (5 days 20^0 C)	mg/l		2-3	5	9
COD	mg/l			43	24

Table 24 : Surface Water Quality Monitoring Results CP-4

Parameters	Units	Standard limits as per WHO Drinking Water Criteria (mg/L)	IS 10500:2012 Drinking water Specification	December, 2023				
		Requirement (Acceptable limit)		Lalungdubi Village	Near 37/1	Near 58/0	Near 87/0	Near AP 1/0
Sampling dates				23.12.23	23.12.23	23.12.23	23.12.23	23.12.23
				31.12.23	31.12.23	31.12.23	31.12.23	31.12.23
pH value		6.5-8.5	6.5-8.5	7.37	7.15	7.15	7.13	7.11
Turbidity	NTU, Max	1	1	3.19	2.76	3.58	2.17	4.19
TDS	mg/l	No health-based guideline value is proposed	500	317	289	289	178	193
Conductance	mS/cm							
Total Alkalinity as CaCO3	mg/l		200	96	56	56	36	68
Total Hardness as CaCO3	mg/l		200	56	72	72	62	54
Calcium as Ca	mg/l		75	38	27.52	27.52	32.9	26.4
Magnesium as Mg	mg/l		30	8.14	6.84	6.84	5.86	5.72
Sulphate as SO4	mg/l	No health-based guideline value has been derived	200	23	21	25	21	17.5
Nitrates as NO3	mg/l	50	45	1.93	3.19	2.71	2.03	2.86
Chloride as Cl	mg/l	200-300	250	23.5	22	22	23.5	27
Fluoride as F	mg/l	1.5	1	0.98	1.56	1.06	0.91	1.03
DO	mg/l	No health-based guideline value is recommended	5	6.8	6.2	6.2	5.6	5.8
BOD (5 days 20^0 C)	mg/l		2-3	**2**	3	3	3	2
COD	mg/l			11	13	13	2.17	10
Sodium Na	mg/l			53	52	42	56	47
Potassium	mg/l			41	37	29	34	32
Iron Fe	mg/l			0.21	0.19	0.23	0.18	0.15
Copper Cu	mg/l			<0.01	<0.01	<0.01	<0.01	<0.01
Total phosphate	mg/l			0.34	0.31	0.25	0.29	0.29
Chromium (Cr)	mg/l			<0.02	<0.02	<0.02	<0.02	<0.02
Manganese (Mn)	mg/l			<0.02	<0.02	<0.02	<0.02	<0.02
Total Coliform	MPN/100ml			51	47	61	50	40
Faecal Coliform	MPN/100ml			Not Detected	Not Detected	Not Detected	Not Detected	Not Detected

Table 25. CP-2 : Quality of RO Water used for drinking

Parameters	**Units**	**Standard limits as per WHO Drinking Water Criteria (mg/L)**	IS 10500:2012 Drinking water Specification	RO treated water
pH value		6.5-8.5	6.5-8.5	7.32
Turbidity	NTU, Max	1	1	<1
TDS	mg/l	No health-based guideline value is proposed	500	87.2
Total Hardness as CaCO3	mg/l		200	4
Calcium as Ca	mg/l		75	BDL
Magnesium as Mg	mg/l		30	BDL
Total Alkalinity as CaCO3	mg/l		200	15
Sulphate as SO4	mg/l	No health-based guideline value has been derived	200	5.2
Nitrates as NO3	mg/l	50	45	3.8
Arsenic as As	mg/l	0.01	0.01	BDL
Irons as Fe	mg/l	No health-based guideline value is proposed	0.3	0.158
Copper	mg/l			0.041
Cadmium	mg/l			BDL
Lead	mg/l			BDL
Zinc	mg/l			0.189
Manganese	mg/l			0.035
Selenium	mg/l			BDL
Fluoride	mg/l			0.37
Chloride as Cl	mg/l	200-300	250	12.4
			CPCB standard	
BOD (5 days 20^0 C)	mg/l		2-3	<2
COD	mg/l			<5

Table 26 : Monitoring of waste water

Parameters	**Units**	**Standard limits as per WHO Drinking Water Criteria (mg/L)**	IS 10500:2012 Drinking water Specification	Adit tunnel Sedimentation tank	Batching Plant Sedimentation Tank	Power House Service Bay	Water Treatment Plant Sedimentation Tank	Waste Water workmans camp	Waste water kitchen
pH value		6.5-8.5	6.5-8.5	8.45	8.42	6.58	6.62	7.24	7.08
Turbidity	NTU, Max	1	1	9.8	4.5	2.8	1.3		
TDS	mg/l	No health-based guideline value is proposed	500	75.2	186.4	87.2	68.1		
TSS	mg/l			83.1	91.3	63.1	55.7	98.6	94.3
Oil & Grese	mg/l		0.5	<5	<5	<5	<5	8.4	<5
Total Hardness as CaCO3	mg/l		200	24	320	80	28		
Calcium as Ca	mg/l		75	15.8	121.8	28.2	10.6		
Magnesium as Mg	mg/l		30	6.2	67.2	17.7	3.7		
Total Alkalinity as CaCO3	mg/l		200	75	385.6	5	15		
Sulphate as SO4	mg/l	No health-based guideline value has been derived	200	24.8	28.7	24.6	21.3		
Nitrates as NO3	mg/l	50	45	4.6	8.2	4.5	3.9		
Phosphate as PO4	mg/l			<0.02	<0.02	<0.02	<0.02		
Salinity	mg/l			0.3	0.4	0.2	0.3		
Conductivity	µs/cm			118	310	135	106		
Arsenic as As	mg/l	0.01	0.01	BDL	BDL	BDL	BDL		
Irons as Fe	mg/l	No health-based guideline value is proposed	0.3	0.537	0.851	0.429	0.313		
Fecal Coliform	MPN/100 ml		Shall not be detectable	Nil	Nil	Nil	Nil		
Total Coliforms Organisms MPN/100 ml	MPN/100 ml		Shall not be detectable	3	2	2	1		
			CPCB standard						
DO	mg/l	No health-based guideline value is recommended	5	5.9	7.4	7.3	7.8	5.7	6.1
BOD (5 days 20^0 C)	mg/l		2-3	6.1	9.3	6.1	3.2	9	7
COD	mg/l			24.8	28.1	25.5	17.5	32	28

Regular water quality monitoring in the RO Plant

Table 27 : Water quality Monitoring at RO Plant CP-2

Date	Time	Source	pH at source	TDS at Source	pH after RO	TDS after RO
01.12.23	8.3[illegible] Am	[illegible]	7.7	51	7.3	13
02.12.23	10.05 Am	Longku Nala	7.5	54	7.1	4
03.12.23	8.30 Am	Longku Nala	7.6	51	7.3	2
04.12.23	9.10 Am	Longku Nala	7.7	50	7.1	10
05.12.23	4.15 Pm	Longkunala	7.7	45	7.0	30
06.12.23	11.00 Am		7.8	48	7.3	4
07.12.23	12.00 PM		7.5	52	7.1	4
08.12.23	3.30 PM		7.8	51	7.3	5
09.12.23	8.02 Am		7.6	80	7.1	6
10.12.23	10.15 Am		7.4	55	7.0	6
11.12.23	11.18 Am		7.6	48	7.1	7
12.12.23	9.30 Am		7.7	57	7.3	3
13.12.23	2.00 Pm		7.5	51	7.0	15
14.12.23	10.18 Am		7.7	50	7.3	8
15.12.23	11.30 Am		7.8	54	7.4	10
16.12.27	10.12 Am		7.5	52	7.1	18
17.12.23	4.00 Pm		7.4	51	7.0	12
18.12.23	9.20 Am		7.8	49	7.0	14
19.12.23	8.50 Am		7.7	52	7.3	8
20.12.23	11.45 AM		7.8	51	7.4	10
21.12.23	3.16 Pm		7.5	48	7.1	17
22.12.23	9.35 Am		7.5	48	7.0	10
23.12.23	12.30 Pm		7.6	47	7.1	11
24.12.23	3.30 Pm		7.4	52	7.1	17
25.12.23	8.43 Am		7.7	54	7.4	13
26.12.23	11.19 Am		7.8	57	7.5	14
27.12.23	9.26 Am		7.7	51	7.1	17
28.12.23	1.30 PM		7.4	49	7.2	19
29.12.23	3.46 Pm		7.5	49	7.1	14
30.12.23	12.00 Pm		7.6	48	7.3	12
31.12.23	01.30 Pm		7.7	51	7.4	10

7.2. D. Analysis of soil

Table 28 : CP-1 Soil testing results
(Date of Sampling : 24-08-2023)

Parameters	Unit	Results
pH		7.42
Soil Type		Loamy Sand
Sand	%	68.99
Clay	%	13.54
Silt	%	13.7
Nitrogen	kg/ha	123.3
Phosphorus	mg/kg	45.3
Potassium	mg/kg	53.6
Electrical Conductivity	mS/cm	2.25
Water Holding Capacity	%	40.6
Organic matter	%	1.44
Salinity	mS/cm	2.36
Iron	g/kg	42.4
Copper	mg/kg	15.6
Nickel	mg/kg	6.62
Manganese	g/kg	18.2
Zinc	mg/kg	26.8
Chloride	mg/kg	132.8

Table 29 : CP-4 Soil Analysis

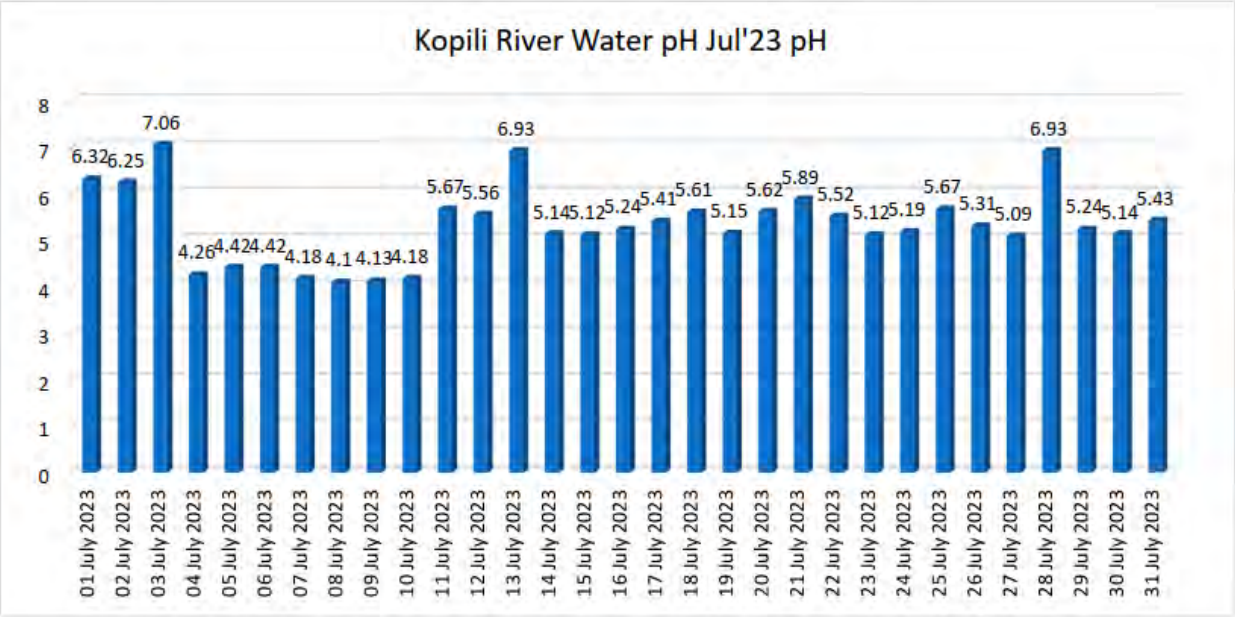
Parameters	Unit	Results				
		Near AP 1/0	Near 87/0	Near 58/1	Near 37/1	Lalungdubi Gaon
		24.12.23	24.12.23	23.12.23	23.12.24	23.12.24
pH	--	6.09	5.83	6.15	5.63	6.37
Conductance	mS/cm	0.436	0.384	0.402	0.432	0.392
Organic Carbon	%	1.79	1.51	1.32	1.56	1.49
Available Nitrogen	%	0.037	0.069	0.082	0.091	0.027
Available Phosphorus	%	0.92	0.44	0.39	0.27	0.19
Available Potassium	%	0.051	0.092	0.082	0.091	0.087
Available Sulpher	%	0.044	0.032	0.025	0.035	0.031
Zinc	mg/kg	302	296	319	209	372
Coppr	mg/kg	276	317	276	280	319
Iron	mg/kg	924	788	1210	910	1020
Manganese	mg/kg	205	160	209	186	297
Boron	mg/kg	43	62	72	54	61

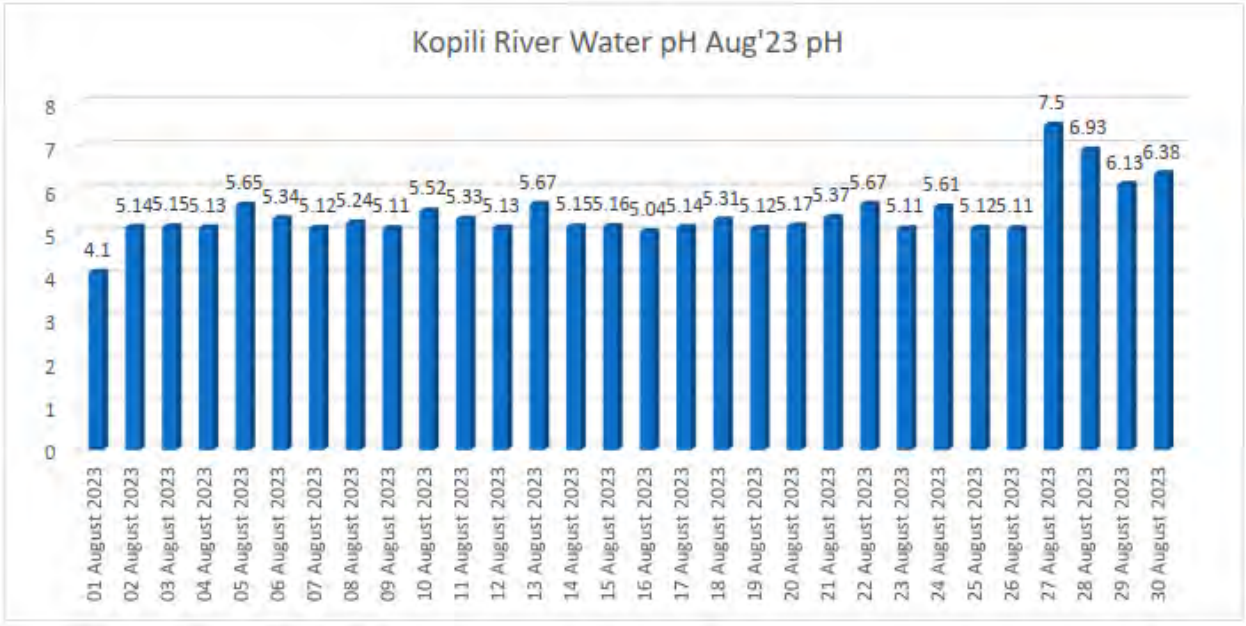
Table 30. CP3. Soil Testing Results
(Sampling date 20.08.2023)

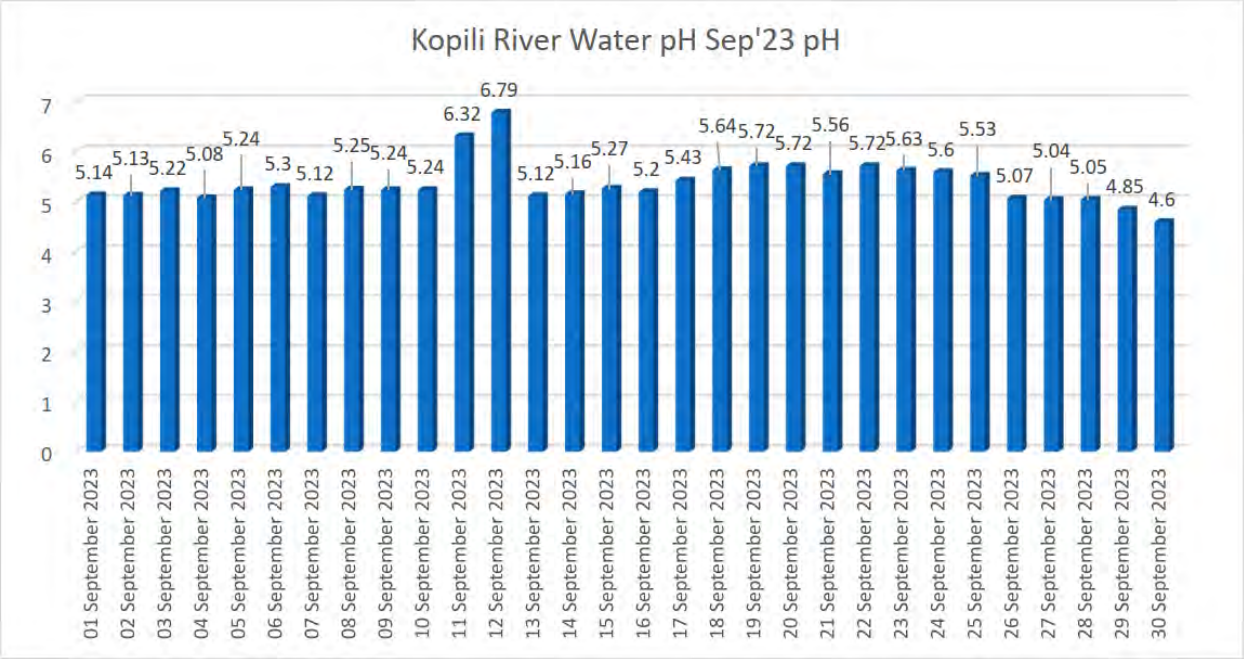
Parameters	Unit	Results		
		Longku	Near Valve House	Near Servive Bay
		20.08.2023	20.08.2023	20.08.2023
pH	--	7.24	6.79	6.93
Soil Type		Slightly high Organic Clay	Silt highly organic clay	Silt highly organic clay
Permeabiality	Cm/sec	1.1×10^{-6}	1.1×10^{-6}	1.1×10^{-6}
Sand	%	74.6	60.2	67.3
Clay	%	11.2	11.4	9.4
Silt	%	21.4	28.4	23.3
Nitrogen	kg/ ha	88.3	0.086	0.072
Phosphorus	mg/kg	10.8	13.5	11.4
Potassium	mg/kg	32.4	14	14.6
Electrical conductivity	mS/cm	10	16	12
Water holding capacity	%	20.5	22	18.4
Organic matter	%	6.1	0.65	0.67
Organic Carbon	%	4.14	4.19	4.14
Iron	g/kg	30.6	83.5	88.6
Copper	mg/kg	8.9	6.2	5.8
Nickel	mg/kg	13.4	3.7	3.4
Manganese	g/kg	7.6	63.12	78.6
Zinc	mg/kg	34.5	0.87	11.2
Arsenic	mg/kg	4.2	0.003	6.2
Cadmium	mg/kg	0.02	<0.001	0.01
Lead	mg/kg	4.4	0.002	0.03
Chromium	mg/kg	6.8	<0.001	<0.02
Aluminium	mg/kg	BDL	BDL	BDL

7.2.E. Monitoring of river water quality :
pH monitoring of the Kopili River water at dam site are shown in the figure 7.

Figure 7: Monitoring River water pH






Kopili River Water pH Sep'23 pH
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4.85
4.6
01 September 2023
02 September 2023
03 September 2023
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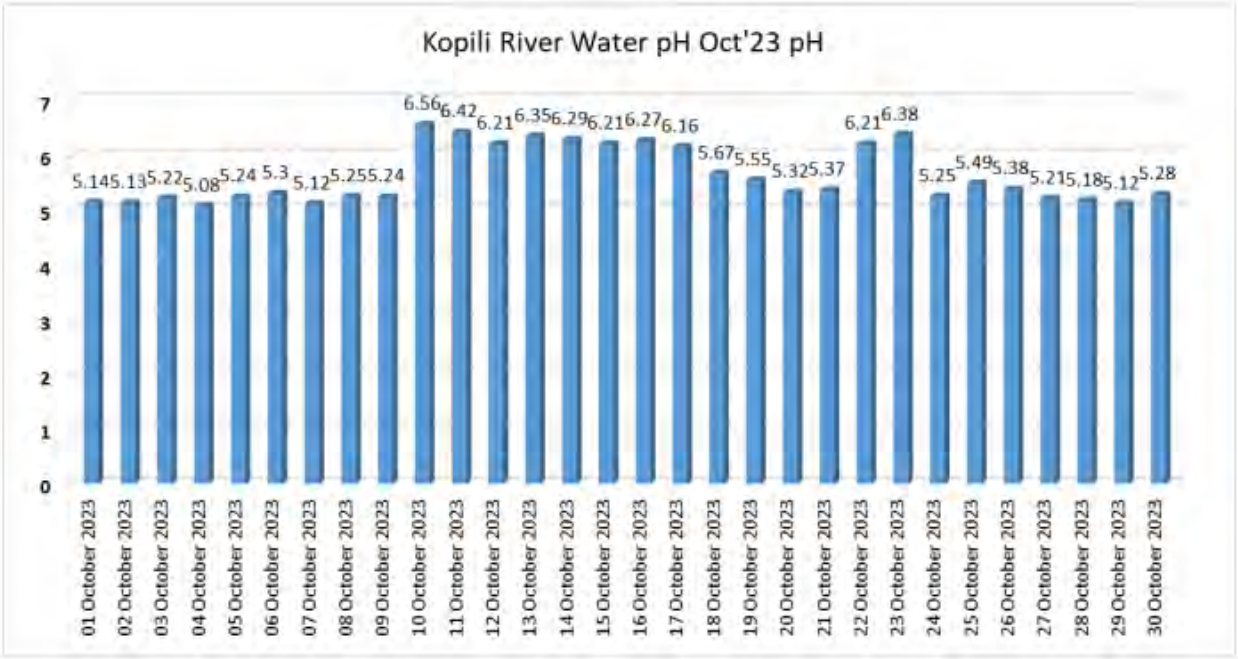
Kopili River Water pH Oct'23 pH
7
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5.21
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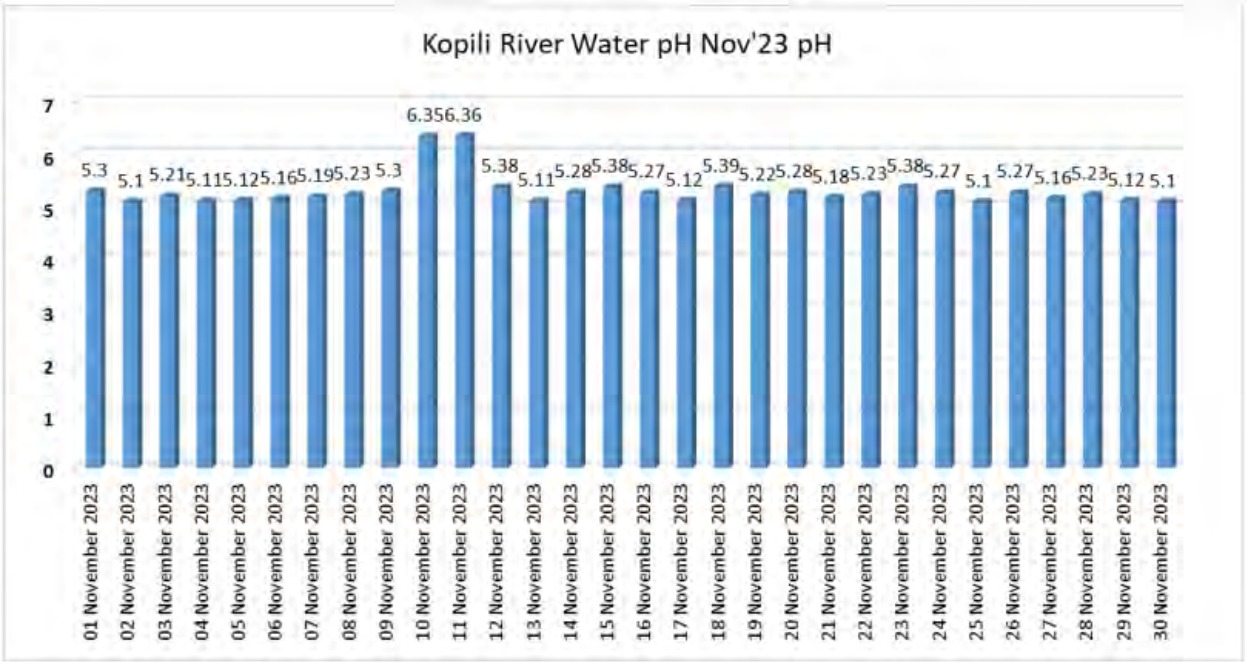
Kopili River Water pH Nov'23 pH
7
6
5
4
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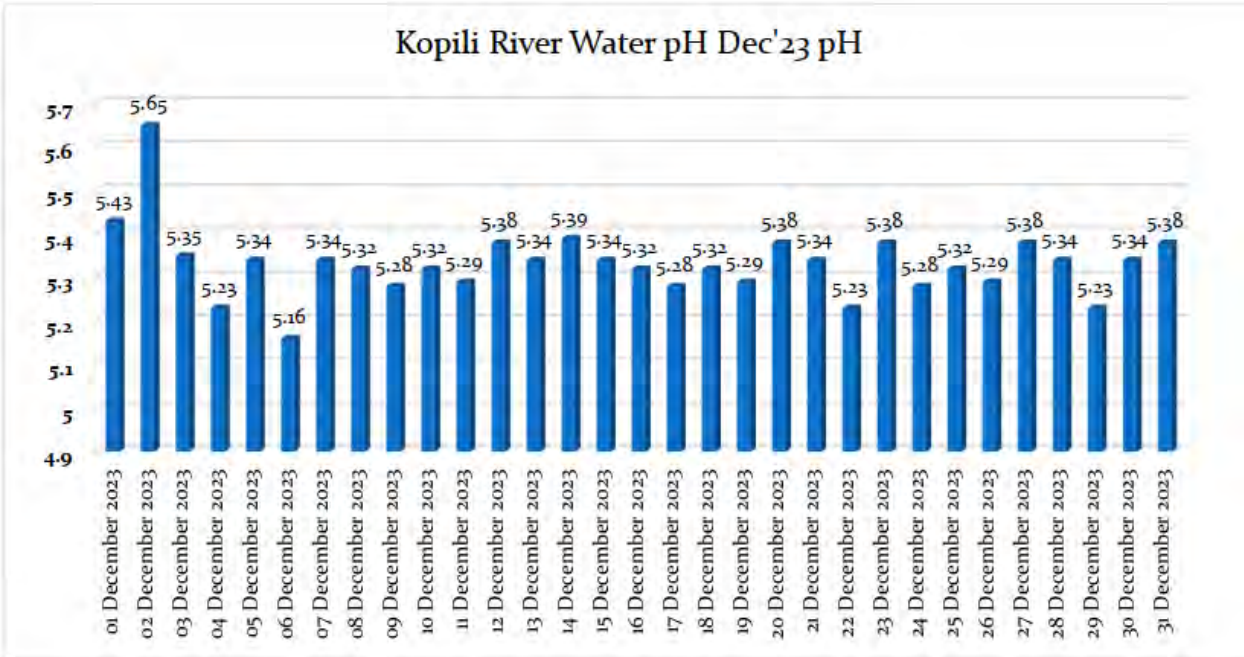
Kopili River Water pH Dec'23 pH
5.7
5.6
5.5
5.4
5.3
5.2
5.1
5
4.9
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5.65
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01 December 2023
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Table 31: Analysis of the all test results.

Ambient Environment condition		Explanatory comments
	Good	Construction phase monitoring for LKHEP performed in the month of July, 2021; October, 2021; December , 2021, March, 2022, September, 2022, February-April 2023; Nov to Dec 2023 (CP-1, Cp-2, CP-4).
		Ambient Air qualities are within prescribed limits of CPCB and IFC norms. In the permanent Colony site and tower locations, either the PM 2.5 or PM 10 was above the WHO standard limits but this was due to plying of the heavy vehicles and other anthropogenic activities. The increase in the PM2.5 during November 2023 near stone crusher unit cannot be compared with WHO ambient air quality standard as PCBA has prescribe limit based on EP Rule 1986 for stone crusher units for SMP not above 600 µgm/m3. Noise level are also within the prescribed limit. No area falls under Residential or Silence area.
		Testing and samplings were done as per the frequencies and parameters recommended in ADB-cleared environment monitoring plan
		Ground water quality results are within the permissible limits in the month of December 21, March 22 September 2022 and February- April 2023 (CP-1, Cp-2, CP-4). In the CP-3 borewell Total coliform was found and it will be treated before consumption. However, at present CP-3 and CP-4 are using packed drinking water due to nonavailability of CTO for RO plants.
		The surface water quality of various sampling stations were found within the standard limits excluding the pH level. As such the water quality may be considered as suitable for various uses. Necessary permissions from the concerned authorities were obtained by the contractors. River water were treated in the water treatment plant before use. The value of BOD as found, i.e. above the standard limit of designated uses, as the river is flowing in hilly terrain with a large catchment area which may be due to runoff of humas form the forest area. Apart from this, cannot rule out the contribution of excreta of wild animals, birds and local domestic animals (Habitation) specially cows for enhancement of BOD value. The value as observed in water quality monitoring may not have any significant impact in power generation and structural integrity of the Dam, HRT, etc. CPCB has formulated the classification of water quality for designated use only. The values of BOD and COD found to be within limit of the standard as prescribed by CPCB for waste water.

7.4 Occupational and Community Health and Safety Monitoring

7.4. A. Safety Statistics

Table 32 : Safety Statistics for the Month of July to December 2023

		CP-1						CP-2						CP-3						CP-4					
Description		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Manpower	Staff	9	9	9	9	9	9	107	110	107	110	113	110	9	11	10	9	12	19	14	11	16	16	13	15
	Workers	14	45	45	45	38	35	894	1037	1076	1014	1107	1288	54	54	41	43	47	51	20	48	36	36	30	48
Man, hours worked.	Staff	1872	1944	1872	1872	1872	1872	37236	38280	39952	38280	35256	35640	1616	1808	1792	1264	2072	2968	2912	2288	3328	3328	2600	2600
	Workers	8320	8320	9360	9360	7904	7280	332328	385836	387192	377436	411480	479136	8856	10960	8120	6336	7624	7936	2400	6144	7488	7488	6000	6000
Near miss		1	0	0	0	0	0	10	0	1	1	3	3	0	1	1	1	2	1	0	1	1	1	1	1
First Aid Case		0	1	0	0	1	2	5	3	2	6	2	6	1	1	1	1	2	1	0	0	3	2	2	0
Accident /Incident		0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LTI		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Observation		5	3	4	5	4	5	223	276	250	255	325	248	3	4	4	5	6	8	3	4	4	6	5	14
Observation Status	Close	2	2	4	4	3	3	223	250	230	255	325	248	3	3	4	5	6	6	2	3	0	4	4	13
	Open	3	1	0	0	0	0	0	26	20	0	0	0	0	1	0	0	0	2	1	1	0	0	1	1
NCR by PMC	HSE related	0	1	0	0	0	0	1	1	0	1	0	0	0	0	1	0	0	0	0	1	0	1	0	1
Safety TBT /Training	TBT	5	4	2	4	4	4	119	99	106	84	92	98	6	4	4	8	25	17	4	16	16	8	10	31
	Training	1	1	1	1	1	1	17	15	12	10	11	14	2	1	1	3	2	1	2	1	2	1	1	7
Health Check-up camp	Pre-Employment medical check-up	2	0	0	0	0	1	3	4	4	804	628	353	0	0	0	1	0	1	0	0	0	8	11	25
HSE Committee Meeting		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
AIDS awareness camp		1	0	0	0	0	0	0	1	1	0	1	1	0	0	0	0	1	1	0	0	0	0	1	1

Non Work Related Accident :-

1 non-work-related accident occurred at Lanka 04.06.23.

Mr. Ananga Kumar Dey met an accident with a motorcycle while crossing road at Lanka with bicycle around 4.30 PM. On 08.07.23 fitness certificate was issued and he joined the work.

7.4.B. Covid vaccination

7.4. C Safety monitoring through App (CP-2)

L&T uses app based monitoring for safety. Following 2 applications are used

1. L&T Safety App
   a. Prestart Briefing
   b. Work Permit system
   c. Near Miss case Reporting
   d. EHS Observation
   e. Covid 19 Check list

2. IB4U
   A. Fire Extinguisher Inspection
   B. Safety Full body Harness Inspection
   C. Vehicles and Earth moving Equipment inspection
   D. Crane Inspection
   E. DG Inspection
   F. Earthing Inspection
   G. Electrical Inspection
   H. Mobile Crane Inspection
   I. RCCB/ELCB Inspection
   J. Scaffold Inspection

7.4. D. Fire Extinguisher

Table 33 : Fire extinguishers installed at site

Sl .no	Location	Type	Capacity (kg)	No's
1.	Surge Shaft Container	CO2	6.5	2
		DCP	1.0	4
2.	Valve House Container	CO2	6.5	1
		DCP	1.0	3
3.	Crusher Plant Area	CO2	6.5	2
		DCP	1.0	3
4.	HRT Adit	CO2	6.5	2
		DCP	1.0	3
5.	Kopili Block	DCP	1.0	4
6.	APGCL Canteen	DCP	6.0	1
7.	APGCL Barak	DCP	6.0	2
8.	Eco Green Canteen	DCP	6.0	1
9.	Lohit Block	DCP	1.0	4
10.	Manas Block	DCP	1.0	4

Sl .no	Location	Type	Capacity (kg)	No's
11.	Dihing Block	DCP	1.0	4
12.	Kolong Block	DCP	2.0	4
13.	Kamang Block	DCP	2.0	4
14.	Brahmapurta Block	DCP	2.0	4
15.	Diju Block	DCP	1.0	4
16.	Digaru Block	DCP	1.0	4
17.	Dikhaw Block	DCP	1.0	4
18.	Bhogdoi Block	DCP	1.0	4
19.	Borgang Block	DCP	1.0	4
20.	New Workmen Camp	DCP	1.0	4
21.	Kulse Block	DCP	1.0	4
22.	Subansiri Block	DCP	2.0	3
23.	Store Container	DCP	1.0	1
24.	P&M Container	DCP	1.0	1
25.	Store	CO2	6.5	2
		DCP	1.0	3
		FOAM	6.2	2
		Fire Bucket		2
26.	P&M Workshop	DCP	1.0	1
27.	Fabrication Yard	DCP	1.0	1
28.	Fabrication yard	DCP	1.0	1
29.	Diesel Browser	DCP	1.0	2
30.	DT Outlet Fire Stand	DCP	2.0	2
		CO2	6.0	1
		Fire sand Bucket	5.0	1
31.	Dam Site Office	DCP	2.0	2
		Fire sand Bucket	5.0	2
32.	Dame Site DG	CO2	6.5	1
33.	Digaru Block	DCP	1.0	4
34.	Dhansiri Block	DCP	1.1	4
35.	Explosive Magazine	DCP	2.0	4
		Fire Sand Bucket	5.0	4
36.	Fuel Substation	DCP	5.0	2
		Foam	9.0	2
		Fire Sand Bucket	5.0	2
37.	PMC Blocks	DCP	1.0	14

Fire extinguisher inspection CP-2

Fire extinguisher placed in labour camp CP-1

7.4.E Other Safety measures

CP-2	
	
Stack height of the Generator increased near office	Proper barricading will be done near the sedimentation tank at Batching Plant

	 
	Rubber pads under electrical panels for insulation and non- slip surfaces provided
	 
	Several type of Color dustbins with segregation arrangement has been provided and also suitable training program organized periodically
	 
Safe Working conditions	First Aid kit at Power House
	 
	Safety nets have been fixed to ensure safe condition.

	
	Rebar caps fixed. Safe Working conditions
CP-4	
	• CP-4 was yet to make arrangements for conducting vertigo test/ height pass. • No worker were allowed to do height works unless they have undergone the height pass test.

7.4.F. PUC of the vehicles.

CP-1


Pollution Under Control Certificate
Date 27/02/2023
Time 17:18:07 PM
Validity upto 26/02/2024
Vehicle Photo with Registration plate 60 mm x 30 mm


Pollution Under Control Certificate
Date 27/02/2023
Time 17:19:39 PM
Validity upto 26/02/2024
Vehicle Photo with Registration plate 60 mm x 30 mm
AS01M C9528

CP3 – PUC sample copies


Form 59
Pollution Under Control Certificate
Authorised By
Government of Haryana
Date 08/06/2023
Time 17:24:24 PM
Validity upto 07/06/2024
HR0730087600203(
HR73B8739
03/Jan/2023
BHARAT STAGE VI
DIESEL
HR0730087
Rs.100.00
(GST to be paid extra as applicable)
Vehicle Photo with Registration plate 60 mm x 30 mm
HR73 B8739

Sr. No.	Pollutant (as applicable)	Units (as applicable)	Emission limits	Measured Value (upto 2 decimal places)
1	2	3	4	5
Idling Emissions	Carbon Monoxide (CO)	percentage (%)		
	Hydrocarbon, (THC/HC)	ppm		
High idling emissions	CO	percentage (%)		
	RPM	RPM	2500 ± 200	
	Lambda	-	1 ± 0.03	
Smoke Density	Light absorption coefficient	1/metre	0.7	0.67

This PUC certificate is system generated through the national register of motor vehicles and does not require any signature.
Note : 1. Vehicle owners to link their mobile numbers to registered vehicle by logging to https://puc.parivahan.gov.in
Authorised Signature with stamp of PUC operator.
60mm x 20 mm

8. Training

Details of the Trainings are given in Table 34.

Table 34: Training conducted by package 2 contractor

(Here workers means Labour, Supervisors engaged by Contractor and sub contractors under package 2 and staff means engineers, and skilled workers engaged directly under L&T pay roll)

Table 34.1. Training Summary : CP-2, July 2023

S No.	EHS Training	No of staff/workmen attended in this month	Total
1	Environment Inspection Attendance	4	92
2	Waste Management	8	148
3	General Environmental Awareness	42	241
4	AIDS/HIV Awareness Training	-	61
5	Fire & Safety Training	-	30
6	Critical Endangered Species Awareness	19	225
7	Environment & Safety Leadership	-	39

Table 34.2 Training Summary : CP-2, August 2023

S No.	EHS Training	No of staff/workmen attended in this month	Total
1	Environment Inspection Attendance	4	92
2	Waste Management	8	148
3	General Environmental Awareness	42	241
4	AIDS/HIV Awareness Training	-	61
5	Fire & Safety Training	-	30
6	Critical Endangered Species Awareness	19	225
7	Environment & Safety Leadership	-	39

Table 34.3. Training Summary : CP-2, September 2023

S No.	EHS Training	No of staff/workmen attended in this month	Total
1	Environment Inspection Attendance	4	92
2	Waste Management	8	148
3	General Environmental Awareness	42	241
4	AIDS/HIV Awareness Training	-	61
5	Fire & Safety Training	-	30
6	Critical Endangered Species Awareness	19	225
7	Environment & Safety Leadership	-	39

Table 34.4. Training Summary : CP-2, October 2023

S No.	EHS Training	No of staff/workmen attended in this month	Total
1	Environment Inspection Attendance	5	96
2	Waste Management	6	154
3	General Environmental Awareness	52	293
4	AIDS/HIV Awareness Training	18	79
5	Fire & Safety Training	22	52
6	Critical Endangered Species Awareness	16	241
7	Environment & Safety Leadership	-	39

Fire and safety mock drill for staff and workers.

Table 34.5. Training Summary : CP-2, November 2023

S No.	EHS Training	No of staff/workmen attended in this month	Total
1	Environment Inspection Attendance	5	96
2	Waste Management	6	154
3	General Environmental Awareness	52	293
4	AIDS/HIV Awareness Training	18	79
5	Fire & Safety Training	22	52
6	Critical Endangered Species Awareness	16	241
7	Environment & Safety Leadership	-	39

Community Awareness for Conservation Biodiversity & Environmental Protection. Nov23

Table 34.6. Training Summary : CP-2, December 2023

S No.	EHS Training	No of staff/workmen attended in this month	Total
1	Environment Inspection Attendance	5	96
2	Waste Management	6	154
3	General Environmental Awareness	52	293
4	AIDS/HIV Awareness Training	18	79
5	Fire & Safety Training	22	52
6	Critical Endangered Species Awareness	16	241
7	Environment & Safety Leadership	-	39
8	Polyethene Deletion and Minimization of Plastic Bags and Polythene Awarness Training	72	72

CP-1 : Training During July to December 2023

Toolbox Training for on duty staff

CP-2	
	
Package-2: Induction Training and Phycal fitness activity conducted at Site.	Package-2: Induction Training and Phycal fitness activity conducted at Site.

CPR Pictorial instructions displayed in first Aid center for general awareness.

CP-3 : Sample of Training in provided by the contractor

SAFETY INDUCTION FOR NEW WORKER

Project Name	Lower Kopili Hydro power project		
Date	14-09-2023	Time	09:00 AM

S. No.	Topic	S. No.	Topic
1	Emergency alarm procedure/assembly point.	12	Welfare: No eating at site, site canteen and toilet arrangement.
2	Smoking Policy & designated smoking place	13	Basic PPEs requirement, Safety Shoes, helmet & re ective jacket.
3	First Aid arrangement at site.	14	No music while at site.
4	Access restrictions detail any areas which are out of bounds.	15	Security arrangements and right of search etc.
5	Prohibition Rules (Child labor, alcohol, arms, drugs)	16	Material storage & waste disposal arrangements and housekeeping.
6	Hazard reporting procedure.	17	Permit to work describe procedure
7	Entry routes to site gives detail for both pedestrian/vehicle routes.	18	Use of PPEs as PPE matrix. (Safety harness, gloves, mask, glasses)
8	Accident and incident reporting procedure including near miss incident.	19	Fire prevention location and type of fire fighting equipment
9	Disciplinary action for safety related failing.	20	No use of mobile while working at site.
10	Use of scaffolding only after approval	21	Client speci c rules, if any.
11	Basic Safety Rules (no horse play, no damaged wire, no naked wire, no cable tray as ladder, and guard at grinder.)	22	Authorization required for hydra operation, lifting and electrical power tools etc.

Safety Induction training imparted by:

Name & Signature: K. Pathak

Tool Box training sample

R SE HSE 002/9

HSE Training / Tool Box Talk

Site:	LKHEP	Date:	15-09-2023
Company / Department:	AHPL/ MKS Engineering	Duration:	15 Minutes.
Location	Power House		
Subject:	Welding safety (Hazard & Precuations).		
Trainer / Supervisor:	K. Pathak	Signature:	

I confirm with my signature that I have taken note and have understoodthe contents of this Safety Training (Tool Box Talk). I have raised and clarified any queries directly with the ANDRITZ responsible person, prior to signing this document.

Company	Name	Designation	Signature
MKS Engineering	Abhijeet Majumdar	Fitter	
MKS Engineering	Rahim Molla	Welder	Rahim Molla
MKS Engineering	Himan Jyoti Boro	Grinder man	
MKS Engineering	Khargeshwar Kalita	Semi skilled	
MKS Engineering	Babul Rabha	Semi skilled	Babul
MKS Engineering	Achyut Tai	Semi skilled	Achyut
MKS Engineering	Apodro warisa	Helper	A. Warisa

ENGINEERED SUCCESS

Photos of tool box talk on welding safety

HSE Training / Tool Box Talk

Site:	LKHEP	Date:	22-09-2023
Company / Department:	AHPL/ MKS Engineering	Duration:	15 Minutes
Location	Switch Yard		
Subject:	Electrical Safety.		
Trainer / Supervisor:	K. Pathak	Signature:	

I confirm with my signature that I have taken note and have understoodthe contents of this Safety Training (Tool Box Talk). I have raised and clarified any queries directly with the ANDRITZ responsible person, prior to signing this document.

Company	Name	Designation	Signature
MKS Engineering	Pradeesh Nair	Site In-charge	
MKS Engineering	M K Rana	Foreman	
MKS Engineering	Swayam Prakash Sah	Fitter	
MKS Engineering	Himan Jyoti Boro	Grinder man	
MKS Engineering	Basudeb Jhanj	Rigger	B. JHANJ
MKS Engineering	Ankur Deka	Electrician	Ankur Deka
MKS Engineering	Apodro warisa	Helper	A - Warisa
MKS Engineering	Pankaj Rana	Semi skilled	Pankaj Rana

ENGINEERED SUCCESS

Photos of tool box talk on Electrical Safety

HSE Training / Tool Box Talk

Site:	LKHEP	Date:	26-09-2023
Company / Department:	AHPL/ MKS Engineering	Duration:	08:15 to 08:30 Am.
Location	Power House		
Subject:	Hot work safety.		
Trainer / Supervisor:	K. Pathak	Signature:	Pathak

I confirm with my signature that I have taken note and have understoodthe contents of this Safety Training (Tool Box Talk). I have raised and clarified any queries directly with the ANDRITZ responsible person, prior to signing this document.

Company	Name	Designation	Signature
MKS Engineering	Rajendra Das	Site Engineer	Das
MKS Engineering	Abhijeet Majumdar	Fitter	Abhi
MKS Engineering	Rahim Molla	Welder	Rahim Molla
MKS Engineering	Himan Jyoti Boro	Grinder man	
MKS Engineering	Khargeshwar Kalita	Semi skilled	Kalita
MKS Engineering	Babul Rabha	Semi skilled	Babul
MKS Engineering	Apodro warisa	Helper	A-Warisa
MKS Engineering	Achyut Tai	Semi skilled	Achyut
MKS Engineering	Ankur Deka	Electrician	Ankur Deka

Photos of tool box talk on Hot work safety

R SE HSE 002/9

HSE Training / Tool Box Talk

Site:	LKHEP	Date:	29-09-2023
Company / Department:	AHPL/ MKS Engineering	Duration:	15 Minutes..
Location	Switchyard		
Subject:	Safety during gas Cutting work (Hazard & Precaution).		
Trainer / Supervisor:	K. Pathak	Signature:	

I confirm with my signature that I have taken note and have understoodthe contents of this Safety Training (Tool Box Talk). I have raised and clarified any queries directly with the ANDRITZ responsible person, prior to signing this document.

Company	Name	Designation	Signature
MKS Engineering	Swayam Prakash Sah	Fitter	
MKS Engineering	Rahul Kumar	Welder	
MKS Engineering	Shivlal Sharma	Semi skilled	
MKS Engineering	Basudeb Jhanj	Rigger	
MKS Engineering	Apodro Warisa	Helper	

ENGINEERED SUCCESS

Photos of tool box talk on Gas cutting safety

Hazard Report Card CP-3

R SE HSE 002/8

Hazard Report Card

Filled out by everyone:

Please use this card to report any hazard, near-miss incident or unsafe practice that you have observed on this site.	
Date and time:	30-09-2023
Name:	Site observation (UA/UC)
Location on site:	U#1 & U#2 Machine hall floor, and site camp.
Observation:	1. The RCCB of the distribution board in the power house was not working properly. 2. Construction material was found laying on the approach of U#1, like...power cable, hose pipe, plywood, steel rod etc... 3. The roatating part of the fan at U#1 in the power house was not coverd. 4. Poor housekeeping was found in C block of site camp.

RCCB is not working.

Construction materials on the way.

The rotating part was not covered.

Poor housekeeping.

ENGINEERED SUCCESS

Root Cause Analysis and Improvement

Filled out by Safety Officer: Kaushalendra Pathak

Cause of accident / incident			
	Defective machine, equipment		Lack of attention
	Sudden fracture of a component		Lack of resources
	Missing / defective protective equipment		Lack of information
	Unexpected chemical reactions		Stress, fatigue, pressure of time
	Lack of coordination		Loss of attention
	Lack of communication		Order / Cleanliness
	Over-estimation of own capabilities		Phenomena of nature
	Wrong process / method		Cause unknown
	Willful intent		Others

Detail:

Safety measure:	Person responsible:	Date:
1. All electrical equipment at the work site must be connected to the RCCB/ELCB, and the RCCB/ELCB must function properly. 2. Housekeeping to be maintained on the site on daily basis. And Access / walkway should be free from any obstacles 3. All moving parts should be coverd with safe guard and no person is allowed to wear loose clothing on the site. 4. Special care should be taken about cleaniiness in the labour camp and dry and wet west should be put in separate dustbins.	Mr R Ram Kumar/ Mr. Pradeesh Nair	30.09.2023

RCCB has been replaced.

The rotating part has been coverd.

ENGINEERED SUCCESS

LABOUR Camp Cleaned.

ENGINEERED SUCCESS

Distribution List

Supervisor : Mr. Pradeesh Nair

Site Manager : Mr. R.Ramkumar

HSE Training / Tool Box Talk

Site:	LKHEP	Date:	05-06-2023
Company / Department:	AHPL/ MKS Engineering	Duration:	03:00 PM to 04.00 PM
Location:	Site camp		
Subject:	Environmental safety training.		
Trainer:	Mr. C S Negi & K Pathak	Signature:	

I confirm with my signature that I have taken note and have understoodthe contents of this Safety Training (Tool Box Talk). I have raised and clarified any queries directly with the ANDRITZ responsible person, prior to signing this document.

Sr. No.	Company:	Name	Designation	Signature:
1	Angath Frefab	Sachin	Supervisor	
2	Angath Frefab	Kapil	Supervisor	
3	MKS Engg.	Mithun Rai	Hydra Opt.	
4	Angath Frefab	Jahid Khan	Foreman	
5	Angath Frefab	Ajid Khan	Fitter	
6	Angath Frefab	Salim	Welder	
7	Angath Frefab	Mohd. Afzal	Welder	
8	Angath Frefab	Tahir	Welder	
9	Angath Frefab	Rijwan	Helper	
10	Angath Frefab	Amir Khan	Welder	
11	Angath Frefab	Anand Mandal	Mason	
12	Angath Frefab	Bikram	Labour	
13	Angath Frefab	Ashish Mandal	Labour	
14	Angath Frefab	Govinda Mandal	Mason	
15	Angath Frefab	Sadanand Mandal	Labour	
16	Angath Frefab	Sushanta Ravidas	Mason	

ENGINEERED SUCCESS

Photo of Environmental safety training

Sample of HSE committee Meeting CP-3

Project name: LKHEP 120MW, Lanku (Assam)

MINUTES OF MEETING

Subject	HSE Monthly Committee Meeting		
Date & Time	30.09.2023/16:00	Venue	Project office Andritz
Conducted By : Sh. R Ram Kumar (Site Manager)			

Sr.	Topic	Discussion Point	Action by	Responsibility	Remarks
1	Safety Contact	LFI share, a worker was at work without wearing the chin strap of his helmet and his helmet struck a steel rod and his helmet fell down but he was not injured.	Reguler TBT and training conduction.	HSE Representative (K. Pathak)	
2	HSE Highlighte	Shri Vishwakarma pooja celebration at our site office.	INFO	All Team	
		Health screening for staff & workers are planned next month.	INFO		
3	HSE Performance	No accident/incident happened in this month.	INFO		
4	Site Observation	The RCCB of the distribution board in the power house needs to properly rectify.	Mr. Pradeesh Nair (MKS) site incharge informed that is rectified.	Ankur Deka (Electrician)	
		Cylinder trolly with gas cutting set has not been provided at the site (Switch yard)	Mr. Pradeesh Nair (MKS) site incharge commeted that point will be impliment within on before 21th of October 2023.	Swayam prakash Sah	
		House keeping is required on site camp.	All Team member accepted that housekeeping will be priorty basis each work location before the starting of the work.	Kapil Kumar (Supervisor)	
		Fire Fighting equipment is not available at site.	Mr. Rupesh Mishra (Andritz Store Incharge) infome that the process of purchasing fire fighting equipment has neen completed and the fire fighting equipment will arrive in the first week of Oct'23.	Mr. Anurag Sharma	

ANDRITZ Hydro

MOM ATTENDANCE SHEET

Venue: ANDRITZ Project office		Date: 30.09.2023

MOM ATTENDANCE SHEET

SR NO	NAME	DESIGNATION	Company	SIGNATURE
1	Mr. R Ram Kumar	Site Manager	ANDRITZ	
2	Mr. Rupesh Mishra	Store Incharge	ANDRITZ	
3	Mr. Anurag Sharma	Engineer	ANDRITZ	
4	Mr. Pradeesh Nair	Engineer	MKS Engineering	
5	Mr. K. Pathak	HSE Officer	MKS Engineering	
6	Mr. Ankur Deka	Electrician	MKS Engineering	Ankur
7	Mr. Sachin Kumar	Supervisor	Angath Prifeb	
8	Mr. Kapil Kumar	Supervisor	Angath Prifeb	Kapil

CP-4 : Safety Training in the month of December 2023 (sample copy)

Training Attendance

Salasar-HSE-FR-12 | Released on 16-03-2023

SALASAR

Project	Pkg 4 (720 MW LKHEP) Sinhar Nagar SS	Location	S/O
Channel Partner	T.A. Architech		
Training Type	☐ Induction ☐ Refresher ☑ Job-Specific ☐ Mock drill		
Training Topic	Work at height Safety precautions.		
Contents (in brief)	Guying arrangement, Road safety awareness, using of proper ppe's.		
Faculty			
Date	03-12-2023	Time	1' 00 pm
Duration (Hr)	1 hours.		

Staff / Workmen Attended

S.N.	Name	Designation	Company	Training feedback (1-10) 1=poor, 10=outstanding	Signature
	Md. Saimur Hussain	filler	T.A Architech		Saimur
	Emadur Rahman	Filler			[illegible]
	Emamul Nadab	Filler			Emamul Nadab
	Sagar Shekh	Filler			SAGAR SKEH
	Asgar Ali	Filler			ASgar Ali
	Rintu Hoque	Filler			RINTU HOQUE
	Husen Sk	G-H			HUSEN SK
	Md. Sayem Ali	GL			MD Sayem Ali
	Mithun	Filler			[illegible]
	Maniarul Hoque	OK			MANIRUL HOQ

Site Engineer/Site Supervisor	Safety Officer
Name: Mr. Manoj Tripathi	Name: Mr. Ashutosh Singh
Sign: [signature]	Sign: [signature]

Scanned with CamScanner

Training Attendance
Salasar-HSE-FR-12|Released on 16-03-2023

SALASAR
Building a stronger future

Project	PKG-4(220 kV LRHEP - Sankarnagar S/S	Location	36/4
Channel Partner	VIP Enterprises		
Training Type	☑ Induction ☐ Refresher ☐ Job-Specific ☐ Mock drill		
Training Topic	Erection work procedure, work at height, safety precautions		
Contents (in brief)	proper Guying arrangement, using of proper PPE's, loading unloading procedure.		
Faculty			

Date	10-12-23	Time	1:30 Pm	Duration (Hr)	1 hours

Staff / Workmen Attended

S.N.	Name	Designation	Company	Training feedback (1-10) 1=poor, 10=outstanding	Signature
1.	Pravash kumar	G-Fitter	VIP		[signature]
2.	Deepak Kumar mehta	Fitter	"	0	Deepak kumar mehta
3.	Nitesh Kumar	Fitter	"	–	[signature]
4.	Mithun	Fitter	"		[signature]
5.	Niraj Kumar	Fitter	"	|	[signature]
6.	Parmanand	Fitter	"	|	Pramanand Ku
7.	Bidya choudhury	G-Helper	"		[thumb impression]
8.	Manoj	G-Helper			
9.				–	
10.	~~Bidya choudhury~~	G			[signature]

Site Engineer/Site Supervisor	Safety Officer
Name: Mr. Sanjay Polie	Name: Mr. Ashutosh Singh
Sign: [signature]	Sign: [signature]

CP-4 Tool Box Training (Sample copy of December 2023)

SALASAR	Toolbox Talk Report	Doc No.: 1 - SALASAR -HSE-Fr-02 Ref. Date: 16/03/2023

Project	[illegible] Sankar Nagar SR.	Location	80/6
Channel Partner	JB Arch, tech		
Activity	Erection work		
Date	[illegible]-12-23 Time 8 30 Am	Duration (Hr)	[illegible], 15m

Activity	Hazard	Risk	Precautions
Erection work	fall from height	High	100 % hooking
			working safety precautions.

SL.No.	Name	Designation	Health Condition Ok/Not Ok	Signature
1	Emamul Nadab	Fitter	Ok	Emamul [illegible]
2	Samirul Hoque	Fitter	OK	SAMIRUL HAQUE
3	Serajul	G-Helper	Ok	SERAJUL
4	Hossain SK	G-Helper	ok	HOSEN SK
5	Mithun Hoque	Fitter	ok	[illegible]
6	Rintu Hoque	Fitter	Ok	RINTU HOQUE
7	Enadur Rahman	Fitter	OK	[illegible]
8	Saimur Hossain	Fitter	Ok	Saimul [illegible]
9	Sagor Sekh	Fitter	OK	SAGAR SEKH
10	Asgar Ali	Fitter	OK	ASGar ALI
11	Gulam Murtja	D.M	OK	Gulam Murtja
12				HUSEN SK
13	MD Sayem Ali	QA	OK	MD Sayem Ali
14	Manirul Hoque	Fitter	OK	MANIRUL HOQUE
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

Signature of Site Supervisor	Signature of HSE Officer
Name:- Mr. Sanjay Paoli	Name :- Mr. Ashutosh Singh
Signature [illegible]	Signature:- [illegible]

SALASAR
Building a stronger future

Toolbox Talk Report

Doc No:- 1 – SALASAR-HSE-Fr-02
Ref. Date: 16/03/2023

Project	PKG(220kV LKFP-Sankarnagar SS)	Location	43/0
Channel Partner	Jhulakhadum		
Activity	Erection work		
Date	6-12-23 Time 9:43 Am	Duration (Hr)	15 m

Activity	Hazard	Risk	Precautions
Erection work	Fall from height	High	100% hooking
			Using of proper ppe's

SL.No.	Name	Designation	Health Condition Ok/Not Ok	Signature
1	SK Rintu	G.2	OK	SK RINTU
2	Hasan	Fitter	OK	HASAM
3	Sokh Hadish	Driving M.	OK	[illegible]
4	SK Lablu	Fitter	OK	SK Lablu
5	JAHIR HOQUE	FITOR	OK	JAHIR HOQUE
6	S Kanchan Ali	Fitter	OK	[illegible]
7	SK Tajur	Fitter	OK	SKTAJUL
8	Sabirul SK	G-Helper	OK	Sabirul SK
9	SK Jafar Ali	Fitter	OK	SK JAFAR ALI
10	SK Akbar Ali	Fitter	OK	SK AKBAR ALI
11	SK Sintu	Fitter	OK	SKSINTU
12	Gulam Ali Rasul	Fitter	OK	[illegible]
13	SK Mahbub	G-Helper	OK	[illegible]
14				SKSINTU
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

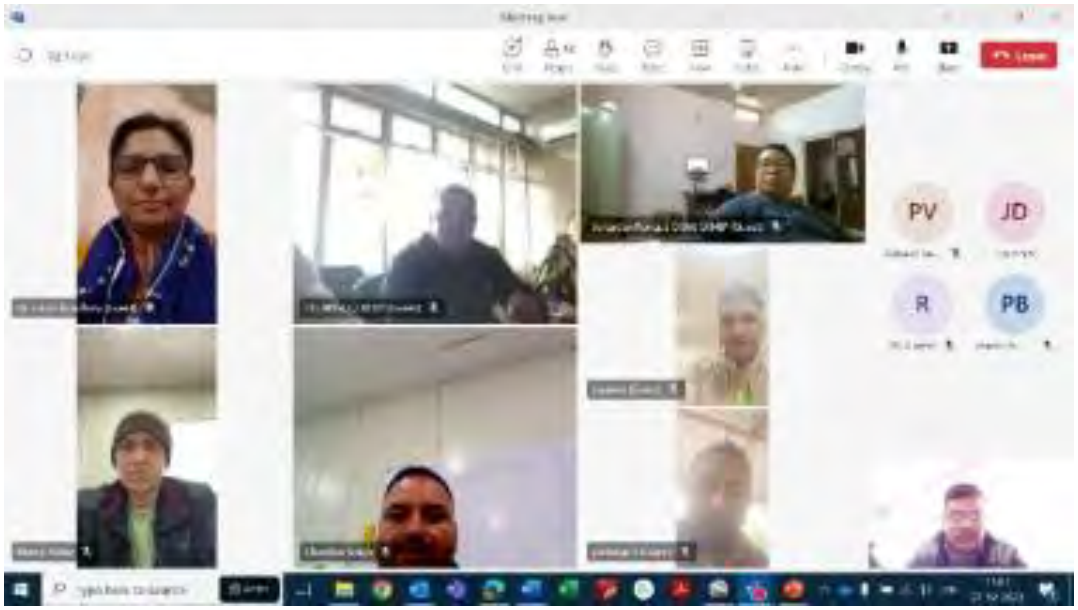
Signature of Site Supervisor	Signature of HSE Officer
Name:- Mr P Sanjay Pole	Name:- Ashutosh Singh
Signature [signature]	Signature:- [signature]

Pkg-4 - Tower Erection Site – Tool Box Talk. Dec 23

Fire Safety training and Use of Firefighting equipment demonstration given by PMC Health & Safety officer to Package-4 Engineer staff and workers at CP-4 Store area on 11th Sep 2023.

Training by PMC

Training on Prevention of sexual harassment at workplace and tunnel safety.



Online participants in Annual training of PMU on 07 Dec 2023

ASSAM POWER GENERATION CORPORATION LIMITED
LOWER KOPILI HYDRO ELECTRIC POWER PROJECT

ATTENDENCE SHEET

Venue/Location: **PMC Conference Hall at Kolong Block, Longku** Date: **07 Dec 2023**

Purpose of Meeting: **Annual training of PMU and other staff on gender mainstreaming, prevention of sexual harassment at workplace, GAP monitoring requirements, OHS etc**

Sl. No.	Name	Sex Age	Designation / Dept.	Contact no./Email	Signature
1.	Jonardan Rongpi	M 54	GM (I/c), Civil, APGCL	jonardan.rongpi@apgcl.org	
2.	Koti Reddy Veyyuru	M 54	Resident Engineer, PMC	Vyyuru.Reddy@aftv.com	
3.	Sabin Das	M 40	AGM (C), APGCL	sabin.das@apgcl.org	
4.	Victor Paul Choudhury	M 36	AGM (C), APGCL	victorpaul.choudhury@apgcl.org	
5.	Animesh Saikia	M 32	AGM (C) I/c, APGCL	animesh.saikia@apgcl.org	
6.	Dhiraj Borthakur	M 42	AM, APGCL	dhiraborthakur@gmail.com	
7.	Diganta Dutta	M 38	JM, APGCL	diganta.dutta001.dd@gmail.com	
8.	Arunabh Borah	M 29	JM, APGCL	arunabhborah@gmail.com	
9.	Krishna Singh	M 46	JM, APGCL	singhkrishna4516@gmail.com	
10.	Kanak Majumdar	M 43	Tunnel Engineer	kanak.mazumdar@aftv.com	
11.	Sangram Singh	M 42	Social & Resettlement Expert, PMC	sangram.singh@aftv.com	
12.	Dr CS Negi	M 44	Health & Safety Expert, PMC	chandan.singh@aftv.com	
13.	Parminder Pal Singh	M 40	QS	parvinder.singh@aftv.com	

Sl. No.	Name	Sex Age	Designation / Dept.	Contact no./Email	Signature
14.	Nikhilesh Thakur	M 26	Material and Quality Control Engineer	9394101415 nikhilesh.thakur@aftv.com	
15.	Marshall Hassa	M 42	Civil Engineer	Hassa.marshall@gmail.com	
16.	Rajesh Tamang	M 39	Geologist	Rajesh.tamang@aftv.com	
17.	Mohan Upadhyay	M 35	Geologist	Mohan.upadhya@aftv.com	
18.	Kartike Chaudhary	M 25	Mechanical Engineer	Chaudhary.kartike@aftv.com	
19.	Manoj Yadav	M 34	Environmental Expert, L&T	manojyadav@lntecc.com 7836013312	
20.	Tushar Gangopadhyay	M 54	Safety Head, L&T	tushar.g@lntecc.com 9332901606	

Annual training of PMU and other staff on gender mainstreaming, prevention of sexual harassment at workplace, GAP monitoring requirements, OHS etc on 07 Dec 2023

Concept of Assessment ,Monitoring & Audit Training

Concept of Assessment ,Monitoring & Audit Training given by PMC Health & Safety Officer to APGCL and PMC Engineer/Executive staff on 30th Sep 2023.

Health & safety tips imparted to PMC and L&T staff about Dengue fever and various preventive measures on 19th August 2023.

Training on Environment Safeguards -Planning to Action on 30.08.2023

9. EMP Expenditure :

EMP Expenditure table (Table 35, 36) summarize details of budget allocated for EMP implementation and the current spend profile.

The EMP Budget is revised as per recommendation and direction of MoEF&CC for the Environmental Clearance.

The originally EMP Budget (as per disclosed EIA, 2018) was US$12.90 m and now it is US$16.76 million incorporating the revised compensatory afforestation cost, biodiversity conservation cost, cost for external monitor, LAD, etc.

Table 35: EMP Expenditure

Sl. No.	Item Cost	Original (INR million)	Revised (INR million)	Remarks	Expenditure so far(₹ Million)
1a	Compensatory Afforestation (CA), and Biodiversity Conservation (BC), etc	191.035	469.969	CA-159.42, OH- 79.71, BC- 190.979, SMC-39.86	469.969
1b	Net Present Value, Boundary pillar of Forest diverted area, Tree extraction / cutting cost (in Forest land)		537.19	NPV- 491.14, BP-1.59, TE-44.46	537.19
1c	Additional biodiversity conservation measures as part of CHA		1.84	(USD 25000)	Partly under EPC contract
2	Catchment Area Treatment	122.370	282.96		282.960
3	Public health delivery system	42.360	42.36		
4	Muck management	34.000	34		Covered under EPC contract
5	Stabilization of quarry sites	11.500	11.5		
6	Restoration and Landscaping of construction sites	10.000	10		
7	Environmental management in road construction	16.952	16.952		* details in table 36
8	Greenbelt development	2.000	2		
9	Solid Waste Management	23.484	23.484		* details in table 36
10	Water pollution control	18.500	18.5		0.7
11	Energy Conservation measures	10.000	10		
12	Disaster Management Plan	37.000	37		
13	Local Area Development (LAD) Plan	58.100	37.4	As per approved CRDTP (May 2017)	
14	Plan to preserve cultural identity of the locals	12.286	12.286		
15	Environmental Monitoring during construction phase	10.992	10.992		* details in table 36

Sl. No.	Item Cost	Original (INR million)	Revised (INR million)	Remarks	Expenditure so far(₹ Million)
16	Monitoring and Evaluation Aspects	6.000	6		
17	Purchase of meteorological instruments	1.000	1		Covered under EPC contract
18	Purchase of noise meter	0.100	0.1		
19	Water Quality Restoration Plan	65.000	65		
20	Training and Awareness Building	2.000	2		Mostly Covered under EPC contract
21	External Monitor	94.510	159.8	As per PAM	22.9
22	Pre-construction baseline monitoring	50.000	50		0.300 (& rest covered under EPC contract)
23	Environmental Monitoring during operation phase (for initial three years)	6.849	6.849		
	Total	**826.038**	**1849.182**		1314.139 (71.02%) (EMP under EPC contract)

Note :

1. As per the Stage I condition of the Forest Clearance Project Proponent has to deposit the CAT (Catchment Area Treatment) Plan budget in the CAMPA Fund prior to Stage II Forest Clearance. Accordingly the amount was deposited CAMPA fund of MoEF&CC. The work on Catchment Area treatment has not been initiated by the Forest Department. APGCL is pursuing the matter with the Forest Department for implementation.
2. BMP will be implemented by APGCL and Forest Department jointly but CAT Plan will be implemented by Forest Department alone. The required amount for implementation of CAT Plan has been deposited to CAPMA, MoEF&CC, Govt. of India.
3. Bird diverters are incorporated in the EPC contract of CP-4.
4. Pyrites testing, pyrite neutralization in water and muck will be covered under EPC contract of CP 2.

Table 36 : Details of the *EMP Expenditure till December 2023 (CP-2).

S.I	Item	Amount (Rs. lakh)
1	Expenditure for Environmental Monitoring (Air, Water & Noise)	12.5
2	Expenditure for DG Stake Monitoring	2.1
3	Portable bio toilet , (4 no.)	2.8
4	Portable prefab toilet , (2 no.)	2.8
5	Implementation of EMP during internal Road construction.	0.25

S.I	Item	Amount (Rs. lakh)
6	Cement bag Provided for community toilet construction	0.15
7	DRDO Bio tank 4000 litre (2 no.)	8.56
8	Prefab container toilet (2 no.)	7.71
9	Plantation on spoil tips (plain area) including bio-fertilizer cost & tree guard cost	1.75
10	Fencing cost for 5000 sqm	17.41
11	Cost of two portable water pumps, (flow 20 cum/hr, 20m head, along with 200 m pipe, 100 mm dia, HDPE) (Used for supply of potable water in the labour camps, water sprinkling for dust suppression, etc)	72.1
12	Watch & Ward for tree plantation	11.5
13	Safety Supervision & monitoring cost	39.5
14	Regular water sprinkling through water tanker on entire roads and NH (water tank capacity 20000 Litter & 12000 litter)	29
15	Fire extinguisher DCP 1KG 50 no./ 2KG 50 no./6KG 30 no./ 9 KG 20 no./BUCKET 20no.	5.9
a)	Fire extinguisher CO2 6.5 KG 20 no.	9.5
16	PPE for staff & workmen (Jacket, Helmet, Shoe, Hand gloves, mask, face shield, ear muffs, ear plugs, safety google, face shield, rain coat, face mask, gum boot, umbrella)	100
17	First Aid medicine	2.4
18	Four First aider	32
19	Water Processing unit	121
20	Operation Maintenance and Chemical consumption for Water Processing Unit	6.1
21	Vermi Compost Pit for food waste	1.95
a	Food waste composite pit construction and making	2.1
22	Batching Plant Sedimentation tank construction cost	2.6
23	Solid Waste Segregation Yard	2.9
24	Slurry removal and pit cleaning cost of batching plant sedimentation tank	3.6
25	Mosquito fogging machine cost	0.67
a	Mosquito fogging O&M cost	0.25
26	Toilet Block Making	7.8
	TOTAL	**506.9**

10. Meaningful Consultation and Grievance Redress

Few consultations were carried out during the reporting period July 2023 to December 2023 (Table 37).

Table 37 : Consultation carried out during the reporting period

Date	Format/Venue	Participants (Occupation,)	Main Issues Raised
Dec.2023	Village	Villagers, PAPA, School Teachers	Local Area Development estimation work and meeting is in progress. Raising the village road sections falling within the submergence area. 
11.12.23	APGCL, Longku	Meeting with Villagers	 Apprised the villagers about the EC amendment and the compensation status.
20.12.23	APGCL, Longku	Facilitation committee meeting APGCL, PMC and NGO CRADLE. .	The proposal of LAD recommended for further process. Improvement of the approach road to the Health Centre.

10.1 Grievance Redress Mechanism

A three-tier grievance redress mechanism has already been notified for handling grievances. The first tier is the grassroots level mechanism. Grievances of the APs are first dealt with by gaon buras in consultation with the field officials, and the contractors of the project. Complaints that cannot be addressed at the level of gaon buras are forwarded to the Project-level grievance redress committee (GRC) which is the second tier. The third tier is the appellate GRC at the state level. APGCL deal with the complaints and grievances as the appellate GRC. There is no bar to take grievances and complaints to national courts for arbitration.

Details of the GRM given in the last EMR.

No cases registered so far on environment issues.

GRM is open to all (communities and workers). Moreover, the workers grievances are additionally addressed by the contractor through their own system. Site Register is maintained in the contractor's camp and in APGCL office. All the complaints are recorded. A format has been developed by Social Expert to record the grievances. Grievance Box was placed at APGCL site office. GRM training given by APGCL Social Expert and R&R NGO to all the affected villages. All the complaints lodged by the workers/labour are addressed by admin department of the contractor. Registers are maintained at site.

11. Initiatives for the Community or Good Engineering Practices :

Programme at Longku school ground Organised by L&T and Longku Police

Compost pits constructed.
Use of cement cubes after testing

Regular anti-mosquito fogging at workmen camp and offices. CP-2

Cement Bags were given to Recycler.
75,000 no. empty cement bag dispatched to recycler agency. Dec 23

LARSEN & TOUBRO LIMITED

LKHEP/ 1138

120 MW LOWER KOPILI HYDRO ELECTRIC PROJECT, LONKHU DIMA HASAO, ASSAM- 788931

DELEVERY CHALLAN

CONSIGNEE: Tirupati Overseas, Thakur Nagar, E-By Pass Sahudangi Hat, Jalpaiguri, W.B - 735135

D.C. NO.: 1138 | DATE: 25/12/23 | CONSIGNEE / SITE CODE NO.:

RN.CD M-25 | SENDING ACCOUNTING CENTRE / SITE CODE LE200685 | M.R. NO. | M.R. DATE | STOCK TYPE | VENDOR CODE

We have despatched following goods. Kindly return the duplicate copy duly signed acknowledging receipt of goods.

Sl. No.	MATERIAL CODE	DISCRIPTION	QUANTITY	UNIT	RATE Rs.	P.
1		Empty Fosroc Auramix Barrel (200/300)	64	Nos		
		Empty Barrel return to vendor				

GATE PASS COPY APPROVED BY: G/Pass no 19682 / 05/01/2023 | TOTAL: 64 Brl.

CONSIGNOR GSTIN - 18AAACL0140P3ZG | CONSIGNEE'S GSTIN -

DESPATCH THROUGH: AS 01HC 3279 | LR/RR NO. & DATE | FREIGHT Rs. | TO PAY / PAID

RECEIPT DETAILS: Sabdul Ali (8011996604)

Sabdul

(SITE MRN NO.) (DATE) (SIGNATURE OF RECEIVER)

REMARKS: (Not for Sale)

L&T CONSTRUCTION 120 MW LKHEP LONGKU

FOR LARSEN & TOUBRO LIMITED

ECC - O&M/STR/90 Registered Office : L&T House, Ballard Estate, Mumbai - 400038 COPY DITRIBUTION: 1. CONSIGNEE 2. Consignee => Consignor 3. GATE PASS (SECURITY => ACCOUNTS) 4. Consignor's File

LARSEN & TOUBRO LIMITED

LKHEP/ 1138

120 MW LOWER KOPILI HYDRO ELECTRIC PROJECT, LONKHU DIMA HASAO, ASSAM- 788931

DELEVERY CHALLAN

CONSIGNEE: Tirupati Overseas, Thakur Nagar, E-By Pass Sahudangi Hat, Jalpaiguri, W.B - 735135

D.C. NO.: 1138 | DATE: 25/12/23

Sl. No.	MATERIAL CODE	DISCRIPTION	QUANTITY	UNIT	RATE Rs.	P.
1		Empty Fosroc Auramix Barrel (200/300)	64	Nos		
		Empty Barrel return to vendor				

GATE PASS COPY APPROVED BY: G/Pass no 19682 / 05/01/2023 | TOTAL: 64 Brl.

DESPATCH THROUGH: AS 01HC 3279

RECEIPT DETAILS: Sabdul Ali (8011996604)

REMARKS: (Not for Sale)

FOR LARSEN & TOUBRO LIMITED

LARSEN & TOUBRO LIMITED

LKHEP/ 1138

120 MW LOWER KOPILI HYDRO ELECTRIC PROJECT, LONKHU DIMA HASAO, ASSAM- 788931

DELEVERY CHALLAN

CONSIGNEE: Tirupati Overseas, Thakur Nagar, E-By Pass Sahudangi Hat, Jalpaiguri, W.B - 735135

D.C. NO.: 1138 | DATE: 25/12/23

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1		Empty Fosroc Auramix Barrel (200/300)	64	Nos		
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GATE PASS COPY APPROVED BY: G/Pass no 19682 / 05/01/2023 | TOTAL: 64 Brl.

DESPATCH THROUGH: AS 01HC 3279

RECEIPT DETAILS: Sabdul Ali (8011996604)

REMARKS: (Not for Sale)

FOR LARSEN & TOUBRO LIMITED

Empty barrels were taken by authorised recycler

First Aid provided to Mr Florica Fisches (23), tourist from Sweden, who came along with his team at our first aid center for first aid treatment.

ADB Mission Team , APGCL & PMC officials attended quality month celebration at dam top location Nov 23

12.0 Corrective Actions

Corrective actions are listed in the table 8 for compliance.

13. Compliance of Output 3. Resource Management and community resilience initiatives (under JFPR) implemented.

(i) installation of sensors and monitoring equipment.

The progress on main activities is given below:

1. Installation of 8 Automatic Rain Gauge System (ARG) & 1 Automatic Weather Station (AWS) stations completed, the systems are made operational and data are available on IMD server. All the ARG sites were visited where Installations were completed by IMD in all respect.
2. In addition, 3 sites were also visited for the installation of additional ARG. The pre-requisite such as NOC and contact details etc. regarding the installation at each site is communicated to IMD. The target date to complete the installation by the mid of February 2024.
3. Site visits to two sites (as per project requirement) for the installation of Automatic Water Level/Velocity instruments were made. Civil works associated with the installation of the AWLR/ system has been proposed to be done by DEE BEE CORPORATION. The target date to complete the installation by the mid of March 2024.
4. Budgetary estimates are being prepared for the procurement of the sensors / systems
5. Several meeting /on-line meetings were held with IMD officials, during the installation of ARG at IMD sites.
6. A meeting was also held in the IMD office Guwahati, with IMD in-charge Shri. K.N. Mohan, Scientist ‘G’ and his IT team RMSI.

Status of the completed ARG/AWS has given in the below Table 38.

Table 38: Status of completed ARG/AWS installation

S.No	Site Name	District	State	Lat/Long	Observatory Type	Installation status
1	Dharamtul	Morigaon	Assam	26.168963 / 92.356958	ARG including TT/RH	Completed
2	Kampur	Nagaon	Assam	26.162534 / 92.664621	ARG including TT/RH	Completed
3	Kheronighat	Karbi Anglong (West)	Assam	25.849590/ 92.881651	ARG including TT/RH	Completed
4	Baithalangso	Karbi Anglong (West)	Assam	25.920000 / 92.670000	ARG including TT/RH	Completed
5	APDCL Sub Station, Umpanai	Karbi Anglong (West)	Assam	25.940483 / 92.299272	ARG including TT/RH	To be completed by mid of Feb, 2024
6	Bakulia	Karbi Anglong (East)	Assam	26.054552 / 93.200965	ARG including TT/RH	Completed
7	Diphu	Karbi Anglong (East)	Assam	25.836331 / 93.434826	ARG including TT/RH	Completed
8	Lumding	Hojai	Assam	25.750043 / 93.179992	ARG including TT/RH	Completed

S.No	Site Name	District	State	Lat/Long	Observatory Type	Installation status
9	Umtrew dam site, (Digaru Basin)	Ri-Bhoi	Meghalaya	26.007250 / 91.811800	ARG including TT/RH	Completed
10	Lower Kopili Hydro Electric Power Plant (LKHEP) Site.	Dima-Hasao	Assam	25.665703 / 92.782555	AWS (WD/WS+TT/RH +Rainfall, Pressure)	Completed
11	PWD Guest House, Habang	Karbi Anglong (West)	Assam	25.715137/ 92.208663	ARG including TT/RH	To be completed by mid of Feb, 2024
12	UMLAPHER PWSS_P.H.E. Division.Kaac	Karbi Anglong (West)	Assam	25.777483/ 92.225074	ARG including TT/RH	To be completed by mid of Feb, 2024
13	Health & Wellness Center, Borgaon	Karbi Anglong (West)	Assam	26.077734/ 92.430938	ARG including TT/RH	To be completed by mid of Feb, 2024

Establishment of Two River Gauging sites

Selection of two sites (as per project requirement) for the installation of Automatic Water Level /Velocity instruments are completed. The exact co-ordinates have been finalized & NOC for the selected sites is to be obtained by APGCL. Civil works associated with the installation of the system has to be done by DEE BEE corporation. RMSI issued work order on 10th Jan 2024.

Quotations are being received from suppliers for the procurement of the sensors/ systems.

(ii) development of dashboards for state and local government agencies for resource management

(iii) development of plans and training for at least 500 people (including 40% women) along the Kopili River basin for increased capacity for managing disaster.

The following five villages were identified through field visit, community consultation and consultation with DDMA and ASDMA.

Table 39 : List of 5 villages where training will be conducted

S. No	District	Village name
1	Hojai	Dakhin Kenduguri
2	Nagaon	Kakotigaon
3	Karbi Anglong	Namtaradubi
4	Dima Hasao	Phanglangso
5	Morigaon	Thengbhanga

14.0 Conclusions and Recommendations

This is the 5th six monthly Environment Monitoring Report for the period July to December 2023. During this period few noncompliance on the environment safeguard issues were observed and are listed in Table 8. Results of the test of ambient air, noise and water also found within the permissible limit July to December 2023. CP-1, CP-2, CP-3 and CP-4 carried out the monitoring of ambient air, noise, water and soil. Regarding safety there were no work-related incident between July to December 2023. One non-work-related accident was reported at Lanka and after treatment the worker again joined the work during this reporting period. 30 number of near miss cases and 42 First aid cases were reported during this reporting period. All the contractors submitted the monthly environment and safety reports. Contractor followed COVID 19 SOP and reported monthly on the compliance, vaccination status, etc. During this reporting period no COVID positive persons were identified. Most of the support facilities are under final stage of construction. Provisions are kept for environmental compliance. Besides tree plantation, awareness programmes were held. Critical habitat assessment and biodiversity assessment were done and it will be reflected in the EIA addendum (interim) which will be disclosed soon. APGCL is in touch with MoEF&CC for obtaining the final EC amendment letter on the changes made during detail engineering design. Multi Disciplinary Committee meeting and Biodiversity Management Committee meeting were held in the month of December 2023. Six monthly Environment Monitoring Report was submitted to MoEF&CC as per the EC stipulation. So far the environmental safeguards measures taken by the contractor was improving in selected domains but in some fields improvements were recommended and were not completed within the agreed timeline for which EA and PMC is closely monitoring the contractors for early compliance of the corrective action plan.

Annexure

Annexure 1 Land Handover to APGCL- 505 Ha.

THE DIMA HASAO AUTONOMOUS COUNCIL SECRETARIAT
HAFLONG:::DIMA HASAO DISTRICT
SETTLEMENT & REVENUE DEPARTMENT

This is to certify that we have handed over and taken over possession of land measuring 505.00 hectares. (Submergence Area) as available in due surface measurement and demarcated as per site selected and prior allotment made vide district council order No. REV/S/34/2017-18/11 dtd. 08/01/2018. for 120 MW Lower Kopili Hydro Electric Project, Longku.

Description of land

1. Location :- Longku.
2. Boundary :-

North :- Jorthelangso village.
South :- Bosolangklam village.
East :- Mungile and other village.
West :- Krungmeng Reserve Forest.

Signature of representative of both sides duly authenticated to handover and taken over possession of land.

Handedover by: -	Takenover by:-
Signature [signature] Addl. Secretary Revenue, Dima Hasao Autonomous Council	Signature [signature] 12/12/2023
Designation Additional Secy Rev.	Designation GM. LKHEP
Date 12/12/23	Date 12/12/2023

General Manager I/C
L.K.H.E.P.APGCL,Longku
Dima Hasao, Assam

Annexure 1 : Reservoir coordinates of 505 HA

	Lat	Long
1	25°39'51.98"N	92°47'43.46"E
2	25°39'51.11"N	92°47'47.18"E
3	25°39'52.08"N	92°47'52.89"E
4	25°39'57.55"N	92°47'50.59"E
5	25°40'7.04"N	92°47'52.83"E
6	25°40'5.51"N	92°48'0.23"E
7	25°40'16.77"N	92°47'57.85"E
8	25°40'11.64"N	92°48'16.68"E
9	25°40'21.00"N	92°48'18.89"E
10	25°40'10.56"N	92°48'21.02"E
11	25°40'0.43"N	92°48'38.21"E
12	25°39'46.29"N	92°48'28.94"E
13	25°39'38.16"N	92°48'40.55"E
14	25°39'42.25"N	92°48'54.38"E
15	25°39'12.32"N	92°49'18.27"E
16	25°39'2.65"N	92°49'5.12"E
17	25°39'8.21"N	92°48'53.20"E
18	25°39'26.39"N	92°48'37.75"E
19	25°39'31.92"N	92°48'27.36"E
20	25°39'22.23"N	92°48'16.56"E
21	25°39'18.96"N	92°48'24.36"E
22	25°38'50.25"N	92°48'49.51"E
23	25°38'36.42"N	92°48'54.07"E
24	25°38'22.19"N	92°48'43.12"E
25	25°38'37.79"N	92°48'11.48"E
26	25°38'46.96"N	92°48'7.46"E
27	25°38'57.03"N	92°47'37.36"E
28	25°39'3.34"N	92°47'35.90"E
29	25°39'11.46"N	92°47'41.90"E
30	25°39'17.43"N	92°47'34.26"E
31	25°39'32.44"N	92°47'36.53"E
32	25°39'27.61"N	92°47'51.74"E
33	25°39'33.14"N	92°48'10.87"E
34	25°39'41.68"N	92°48'3.26"E
35	25°39'33.38"N	92°47'51.23"E
36	25°39'35.81"N	92°47'46.72"E
17	25°39'46.42"N	92°47'43.42"E
38	25°39'45.50"N	92°47'41.09"E
39	25°39'38.74"N	92°47'42.35"E
40	25°39'40.90"N	92°47'37.17"E
41	25°39'43.86"N	92°47'37.19"E

24/12/2023.

Lot Patwary i/C
Umrongso
...Cachar Hills Autonomous Council

Annexure 2 Copy of the EAC minutes of MoEF&CC

सत्यमेव जयते

Government of India
Ministry of Environment, Forest and Climate Change
IA Division
(River Valley and Hydroelectric Projects)
***

Minutes of 2ND MEETING OF THE EXPERT APPRAISAL COMMITTEE meeting River Valley and Hydroelectric Projects held from 26/10/2023 to 26/10/2023

Date: 14/11/2023

MoM ID: EC/MOM/EAC/522623/10/2023

Agenda ID: EC/AGENDA/EAC/522623/10/2023

Meeting Venue: N/A

Meeting Mode: Virtual

Date & Time:

26/10/2023	10:30 AM	05:30 PM

1. Opening remarks

The 2nd meeting (online mode) of the re-constituted EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 26th October, 2023 under the Chairmanship of Prof. G. J. Chakrapani.

2. Confirmation of the minutes of previous meeting

The EAC while confirming the Minutes of the 1st EAC meeting held on 17-18 October, 2023 and recommended for addition of following para after completion of para no. 1.5.1 of Agenda Item No. 1.5 regarding grant of amendment in TOR issued on 09.11.2022 for conducting EIA study for construction of Tarali Off Stream Open Loop Pumping Storage Project (1500 MW) in an area of 150.74 ha at Village Kalambe, Jalu, Nivade and Tondoshi, Sub District Patan, District Satara, Maharashtra by M/s Adani Green Energy Limited, [Proposal No. IA/MH/RIV/443150/2023; F. No. J-12011/52/2023-IA.I (R)] : "…Shri Janardan Choudhary is presently working as Advisor in M/s Adani Green Energy Ltd; so, to avoid any conflict of Interest he had not participated in the deliberations on Agenda item No. 1.5 regarding grant of amendment in TOR issued by the Ministry on 09.11.2023 for conducting EIA study for construction of Tarali Off Stream Open Loop Pumping Storage Project (1500 MW) in an area of 150.74 ha at Village Kalambe, Jalu, Nivade and Tondoshi, Sub District Patan, District Satara, Maharashtra by M/s Adani Green Energy Limited of M/s Adani Green Energy Limited…." With the above corrections the EAC confirmed the Minutes of the 1st EAC meeting held on 17-18 October, 2023.

3.3. Agenda Item No 3:

3.3.1. Details of the proposal

Lower Kopili HEP (120MW) in Karbi Anglong & Dima Hasao, Assam, by M/s Assam Power Generation Corporation Ltd. by **APGCL** located at **DIMA HASAO,ASSAM**			
Proposal For		Amendment in EC	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/AS/RIV/441844/2023	J-12011/26/2012-IA.I	23/10/2023	River Valley/Irrigation projects (1(c))

3.3.2. Project Salient Features

2.4.1: The proposal is for grant of amendment in Environmental Clearance to the Lower Kopili HEP (120 MW) in Karbi Anglong & Dima Hasao, Assam by M/s Assam Power Generation Corporation Ltd.

2.4.2: The Project Proponent and the accredited Consultant made a detailed presentation on the salient features of the project and informed that:

1. The Lower Kopili HEP (120 MW) is downstream development of existing Kopili HEP stage I and is located in east of Karbi Anglong and west of Dima Hasao districts of Assam.
2. The project is situated in the West Karbi Anglong and Dima Hasao (also known as North Cachar Hills) Autonomous District Council (ADC) areas of Central Assam. The Project location (dam site) is defined by 25°39'57.39"N latitude and 92°46'53.62"E longitude
3. The dam structure is located on Kopili River (a major tributary of the Brahmaputra River) and the main powerhouse and auxiliary power house structures are located on right bank of Kopili River.
4. The project envisages utilization of the regulated discharge from Kopili HEP, spills of Khandong and Umrong Dam and the discharge from the intermediate catchment by creation of a reservoir and utilizing a gross head of about 114m.
5. This is a run-of-the-river scheme.
6. The scheme has been conceived to run at full potential in monsoon season and operate as a peaking station in non-monsoon season.
7. **Land requirement**: The total land requirement of the project is **1577** ha. The forest land to be acquired for the project is 523 ha. The private land to be acquired for the project is 1054 ha.
8. **Forest Clearance**: In principle approval of Stage 1 Forest Clearance for the diversion of 523.046 ha of forest land was accorded on 27 .03.2019.
9. **Environment clearance** for the project was accorded **on 04.09.2019**
10. **E flow** will be maintained as per stipulation of EC.
11. **Salient features of the project:**

1. Land Area: 1577 Ha (Forest land 523.0 Ha, Revenue land 1054.0 Ha)
2. Power generation capacity: 120 MW (MPH – 2 X 55 MW; APH – 2 X 2.5 + 1 X 5 MW)
3. Location of Dam Axis: 25°39'57.39"N; 92°46'53.62"E
4. Location of MPH: 25°41'5 4.02"N; 92°48'15.98"E
5. Concrete Gravity Dam: Across the river Kopili at Longku
6. Dam Height 66.5 m
7. water conductor system comprising of an intake structure, head race tunnel along with surge shaft and pen stock.
8. **Project cost: 1031.58 Cr excluding the R&R land cost 84.33 Cr.**
9. **EMP cost: 26147.5077 lakh**
10. **CER cost: 5.81 Cr**

1. **The details of amendment sought is as under:** -

S. No.	Para/ details of EC issued by MoEF&CC	Details as per EC	To be revised/ read as	Justification/ reasons
1	Dam Height (m)	70.13	66.5	El. 228.00 m – El. 162.50 m = 66.50m. Change in dam design alters consumption of construction materials (e.g., concrete) and the volume of muck generated for disposal on-site.
2	Length of the Dam (m) Total width of dam structure including overflow & non overflow blocks	345.05	335.0	As per revised arrangement of NOF and OF section.
3	No of Spillways	8	6	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 adequate to pass the PMF at N-1 condition.

				Same is approved by CEA
4	HRT Diameter (m)	6.65	7.0	Diameter of HRT is increased to ensure CEA approved head losses of 6m.
5	HRT length (m)	3619.62	3641.22	As per revised arrangement.
6	Tail Race Channel width (m)	26.3	26.0	Arrangement is revised to provide better hydraulic condition at the outlet of tail race.
7	Tail Race Channel length (m)	52.0	40.0	
8	Submergence area with the Reservoir spread (Ha)	552 submergence area	552 submergence area with reservoir spread of 620 Ha	Submergence area remains same i.e. 552 Ha within the reservoir spread of 620 Ha to accommodate plantation area as per EC and FC stipulation, Reservoir rim treatment, safety area for human and wildlife, within the existing land area of 1577 ha.

3.3.3. Deliberations by the committee in previous meetings

N/A

3.3.4. Deliberations by the EAC in current meetings

The EAC deliberated on the information and as presented in the meeting and observed that the proposal is for Amendment in Environmental Clearance to the project for Lower Kopili HEP (120 MW) in Karbi Anglong & Dima Hasao, Assam by M/s Assam Power Generation Corporation Ltd.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

3.3.5. Recommendation of EAC

Recommended

3.3.6. Details of Environment Conditions

3.3.6.1. Specific

Additional Condition	
1.	1. Aquatic study specially, migratory aquatic species concerning occurrence of fishes /habitat impact studies shall be carried out from recognised govt. Institutes and prepared mitigation measures, with provision of financial budget revised in the EMP. The outcome of the said study shall be implemented. 2. Submit undertaking that R&R scenario /habitat of flora and fauna of project are not change due to modification of the project components.

Environmental Monitoring Report

PUBLIC

Semestral Report: July 2023 – December 2023
December 2024

India: Assam Power Sector Investment Program - Tranche 3

Part 2 of 3: Annexure 2 (continued) and Annexure 3 - 23

Prepared by Assam Power Generation Corporation Limited (APGCL) for the Asian Development Bank (ADB).

Asian Development Bank

	3. All the conditions mentioned in the EC dated 4.09.2019 shall remain unchanged.

4. Any Other Item(s)

N/A

5. List of Attendees

Sr. No.	Name	Designation	Email ID	Remarks
1	Prof. G. J. Chakrapani	Chairman	gov**********@es.iitr.ac.in	
2	Shri Ajay Kumar Lal	Member	akl****@gmail.com	
3	Dr Mukesh Sharma	Member (EAC)	muk***@iitk.ac.in	
4	Dr Uday Kumar R Y	Member (EAC)	uda********@yahoo.com	
5	Shri Sharvan Kumar	Member (EAC)	Dir****@gmail.com	
6	Dr J A Johnson	Member (EAC)	jaj@wii.gov.in	Absent
7	Dr B K Das	Member (EAC)	ami********@icar.gov.in	
8	Shri Janardan Choudhary	Member	jan**********@gmail.com	
9	Dr. J V Tyagi	Member	jvt******@gmail.com	Absent
10	Shri Kartik Sapre	Member	kar********@gmail.com	
11	Alok Paul Kalsi	Member	emo***@nic.in	
12	Yogendra Pal Singh	Scientist E	yog*******@nic.in	

MINUTES OF THE 2ND MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 26TH OCTOBER, 2023 FROM 10:30 AM – 05.30 PM THROUGH VIDEO CONFERENCE (ONLINE MODE).

The 2nd meeting (online mode) of the re-constituted EAC for River Valley & Hydroelectric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 26th October, 2023 under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is shown in the Annexure.

Agenda Item 2.4

Lower Kopili HEP (120 MW) in Karbi Anglong & Dima Hasao, Assam by M/s Assam Power Generation Corporation Ltd- Amendment in Environmental Clearance- Reg

[Proposal No. IA/AS/RIV/441844/2023; F. No. J-12011/26/2012-IA.I]

2.4.1: The proposal is for grant of amendment in Environmental Clearance to the Lower Kopili HEP (120 MW) in Karbi Anglong & Dima Hasao, Assam by M/s Assam Power Generation Corporation Ltd.

2.4.2: The Project Proponent and the accredited Consultant made a detailed presentation on the salient features of the project and informed that:

i. The Lower Kopili HEP (120 MW) is downstream development of existing Kopili HEP stage I and is located in east of Karbi Anglong and west of Dima Hasao districts of Assam.
ii. The project is situated in the West Karbi Anglong and Dima Hasao (also known as North Cachar Hills) Autonomous District Council (ADC) areas of Central Assam. The Project location (dam site) is defined by 25°39'57.39"N latitude and 92°46'53.62"E longitude
iii. The dam structure is located on Kopili River (a major tributary of the Brahmaputra River) and the main powerhouse and auxiliary power house structures are located on right bank of Kopili River.
iv. The project envisages utilization of the regulated discharge from Kopili HEP, spills of Khandong and Umrong Dam and the discharge from the intermediate catchment by creation of a reservoir and utilizing a gross head of about 114m.
v. This is a run-of-the-river scheme.
vi. The scheme has been conceived to run at full potential in monsoon season and operate as a peaking station in non-monsoon season.
vii. **Land requirement**: The total land requirement of the project is **1577** ha. The forest land to be acquired for the project is 523 ha. The private land to be acquired for the project is 1054 ha.
viii. **Forest Clearance**: In principle approval of Stage 1 Forest Clearance for the diversion of 523.046 ha of forest land was accorded on 27 .03.2019.
ix. **Environment clearance** for the project was accorded **on 04.09.2019**
x. **E flow** will be maintained as per stipulation of EC.
xi. **Salient features of the project:**

a. Land Area: 1577 Ha (Forest land 523.0 Ha, Revenue land 1054.0 Ha)
b. Power generation capacity: 120 MW (MPH – 2 X 55 MW; APH – 2 X 2.5 + 1 X 5 MW)
c. Location of Dam Axis: 25°39'57.39"N; 92°46'53.62"E
d. Location of MPH: 25°41'5 4.02"N; 92°48'15.98"E
e. Concrete Gravity Dam: Across the river Kopili at Longku
f. Dam Height 66.5 m
g. water conductor system comprising of an intake structure, head race tunnel along with surge shaft and pen stock.
h. **Project cost: 1031.58 Cr excluding the R&R land cost 84.33 Cr.**
i. **EMP cost: 26147.5077 lakh**

j. **CER cost: 5.81 Cr**

xii. **The details of amendment sought is as under: -**

S. No.	Para/ details of EC issued by MoEF&CC	Details as per EC	To be revised/ read as	Justification/ reasons
1	Dam Height (m)	70.13	66.5	El. 228.00 m – El. 162.50 m = 66.50m. Change in dam design alters consumption of construction materials (e.g., concrete) and the volume of muck generated for disposal on-site.
2	Length of the Dam (m) Total width of dam structure including overflow & non overflow blocks	345.05	335.0	As per revised arrangement of NOF and OF section.
3	No of Spillways	8	6	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 adequate to pass the PMF at N-1 condition. Same is approved by CEA
4	HRT Diameter (m)	6.65	7.0	Diameter of HRT is increased to ensure CEA approved head losses of 6m.
5	HRT length (m)	3619.62	3641.22	As per revised arrangement.
6	Tail Race Channel width (m)	26.3	26.0	Arrangement is revised to provide better hydraulic condition at the outlet of tail race.
7	Tail Race Channel length (m)	52.0	40.0	
8	Submergence area with the Reservoir spread (Ha)	552 submergence area	552 submergence area with reservoir spread of 620 Ha	Submergence area remains same i.e. 552 Ha within the reservoir spread of 620 Ha to accommodate plantation area as per EC and FC stipulation, Reservoir rim treatment, safety area for human and wildlife,

				within the existing land area of 1577 ha.

2.4.3: The EAC during deliberations noted the following:

The EAC deliberated on the information and as presented in the meeting and observed that the proposal is for Amendment in Environmental Clearance to the project for Lower Kopili HEP (120 MW) in Karbi Anglong & Dima Hasao, Assam by M/s Assam Power Generation Corporation Ltd.

The project/activity is covered under Category A of item 1 (c) 'River Valley projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

2.4.4 The EAC after detailed deliberation on the information submitted and as presented during the meeting recommended for amendment in Environmental Clearance dated 4.09.2019 to the project for Lower Kopili HEP (120 MW) in Karbi Anglong & Dima Hasao, Assam by M/s Assam Power Generation Corporation Ltd under the provisions of EIA Notification, 2006, as proposed by the project proponent subject to compliance of following additional condition as under: -

i. Aquatic study specially, migratory aquatic species concerning occurrence of fishes /habitat impact studies shall be carried out from recognised govt. Institutes and prepared mitigation measures, with provision of financial budget revised in the EMP. The outcome of the said study shall be implemented.
ii. Submit undertaking that R&R scenario /habitat of flora and fauna of project are not change due to modification of the project components.
iii. All the conditions mentioned in the EC dated 4.09.2019 shall remain unchanged.

Annexure 3 Renewal copy of Labour license (CP-2 for 1500 workers)

STOP CHILD LABOUR

सत्यमेव जयते

FORM-VI

[See Rule-25(1)]

LO Office(Haflong)

LICENSE UNDER CONTRACT LABOUR (REGULATION & ABOLITION) ACT, 1970

UBIN	:	**299/566476/AAACL0140P/11/2022**
UAIN	:	**LCFORMIVCL/2023/23298**
License No.	:	**CLL/2023/AQ1701234326018W6**
Date of Issue	:	**29/11/2023**

1. Licence is hereby granted to **LARSEN AND TOUBRO LIMITED** under Section 12(1) of the Contract Labour (Regulation and Abolition) Act,1970 subject to the conditions specified in the Annexure.

2. The Licence is for doing the work of **CIVIL AND HYDRO MECHANICAL AND ELECTRICAL WORKS FOR CONSTRUCTION OF 120 MW LKHEP**, in the Establishment of **120MW LOWER KOPILI HYDRO ELECTRIC PROJECT** ,C/O. **ASSAM POWER GENERATION CORPORATION LIMITED** at **LONGKU, , UMRANGSO, DIMA HASAO - 788931, ASSAM** .

3. The Licence shall remain in force till **07/12/2024 .**

4. Maximum No of contract labour proposed to be employed in the establishment on any date : **1500 nos.**

5. VALID FOR **DIMA HASAO** ONLY and only for the purpose mentioned in this certificate.

6. Payment Details:

GRN	AS005782815202324E
CIN	12602023301100001
Txn Date	29/11/2023
Amount	152100.00
Status	Y

(Scan the QR Code for authentification)

LO Office(Haflong)
Licensing Officer

*** This is a computer generated certificate and it does not require a Signature/Seal.***
Terms & Conditions of this Certificate is enclosed as Annexure-I.

STOP CHILD LABOUR

Reference No: LCFORMIVCL/2023/23298 To View: https://eodb.assam.gov.in/t/fkGw/EB69992B Token No: EB69992B

Annexure 4. Certificate of Registration of APGCL under Inter-State Migrant Workmen

STOP CHILD LABOUR

GOVT. OF ASSAM

Assistant Labour Commissioner(Guwahati)

FORM 11

CERTIFICATE OF REGISTRATION UNDER INTER-STATE MIGRANT WORKMEN (RE & CS) ACT, 1979

UBIN	:	299/9411702/AAFCA4891F/5/2023
UAIN	:	LCFORM1/2023/00016
Registration No.	:	MGW(E)/2023/IS16837844583790R3
Date of Issue	:	11/05/2023

A Certificate of registration containing the following particulars is hereby granted under Clause(a) of Sub-Section (2) of Section-4 of the Inter-State Migrant Workmen (Regulation of employment and conditions of service) Act 1979, and the rules made thereunder to **M/S LOWER KOPILI HYDRO ELECTRIC PROJECT .**

1. Nature of work carried on in the establishment: **HYDRO ELECTRIC PROJECT**

2. Name and Address of contractors:

S. No.	Full Name	Street Name 1	Street Name 2	Village/Town	District	Pincode	State
1.	ANDRITZ HYDRO PVT. LTD.	LONGKU	LONGKU	LONGKU	DIMA HASAO	788931	ASSAM
2.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3.	LARSEN & TOUBRO LTD.	LONGKU	LONGKU	LONGKU	DIMA HASAO	788931	ASSAM
4.	SALASAR TECHNO ENGINEERING LTD	LONGKU	LONGKU	LONGKU	DIMA HASAO	788931	ASSAM

3. Nature in which migrant workmen are to be employed or are employed: **CONSTRUCTION AND ERECTION**

4. Maximum no. of migrant workmen to be employed on any day through such contractor : **100**

5. Other particulars relevant to the employment of migrant workmen:

6. Payment Details:

GRN AS003901/412023249

CIN 134054044

Txn Date 11/05/2023

Amount 150.00

Status Y

(Scan the QR Code for authentification)

Assistant Labour Commissioner(Guwahati)

)

Registering Officer

5/11/23, 12:04 PM ServicePlus- Registration of Establishment as the Principal Employer in Form I under Section 4 of the Interstate Migrant Wo...

*** This is a computer generated certificate and it does not require a Signature/Seal.***

*** Terms & Conditions of this Certificate is enclosed as Annexure-I.***

STOP CHILD LABOUR

Annexure 5 Inter-State Migrant Workmen license CP-2

STOP CHILD LABOUR

FORM-VIII
[See Rule-11(1)]
GOVERNMENT OF ASSAM
LO Office(Haflong)

LICENCE OF CON TRACTOR FOR EMPLOYMENT OF MIGRANT WORKMEN UNDER INTERSTATE MIGRANT WORKMEN (RE & CS) ACT, 1979

UBIN	:	**299/566476/AAACL0140P/11/2022**
UWN	:	**COLFORMV/2023/00027**
Original Registration No.	:	**MGW(E)/2023/S1683784458790R3**
Licence No.	:	**MGW(E)/2023/4Q1695292971226E4**
Date of Issue	:	**21/09/2023**

1. Licence is hereby granted to **LOWER KOPILI HYDRO ELECTRIC PROJECT APGCL** under Section 8(1) of the Inter State Migrant Workmen (Regulation of Employment and Condition of Service) Act,1979 subject to the conditions specified in the Annexure

2. The Licence is for doing the work of **CONSTRUCTION AND ERECTION OF 120 MW LOWER KOPILI HYDRO ELECTRIC PROJECT** , in the Establishment of **LOWER KOPILI HYDRO ELECTRIC PROJECT APGCL** at **3RD FLOOR , BIJULI BHAWAN ,PALTAN BAZAR,GUWAHATI,KAMRUP ,781008 ASSAM**

3. No. of migrant workers to be engaged **100 nos.**

4. The License shall remain in force till **20/09/2024** .

5. Payment Details:

GRN AS003640799202324P
CIN 10004672023092103406
Txn Date 21/09/2023
Amount 30080.00
Status Y

LO Office(Haflong)
Licensing Officer

(Scan the QR Code for authentification)

*** This is a computer generated certificate and it does not require a Signature/Seal.***
Terms & Conditions of this Certificate is enclosed as Annexure-I.

STOP CHILD LABOUR

Reference No: COLFORMV/2023/00027 To View: https://eodb.assam.gov.in/el7w/77118F9F Token No: 77119F9F

Annexure 6 Labour License for the Migrant Workers (CP-3)

STOP CHILD LABOUR

FORM-VI
[See Rule-25(1)]

Office of the Commissionerate of Labour
LICENSE UNDER CONTRACT LABOUR (REGULATION & ABOLITION) ACT, 1970

UBIN	:	**299/511133/NOPAN/12/2023**
UAIN	:	**LCFORMIVCL/2023/24708**
License No.	:	**CLL/2023/JE1703778326915L0**
Date of Issue	:	**28/12/2023**

1. Licence is hereby granted to **MKS ENGINEERING COMPANY** under Section 12(1) of the Contract Labour (Regulation and Abolition) Act,1970 subject to the conditions specified in the Annexure.

2. The Licence is for doing the work of **ERECTION AND COMMISSIONING OF ELECTRO MECHANICAL AND HYDRO MECHANICAL WORKS OF HYDRO POWER STATION**, in the Establishment of **CHIEF GENERAL MANAGER PP and I APGCL** ,C/O. **APGCL** at **PALTAN BAZAR, , GUWAHATI, KAMRUP METRO - 781001, ASSAM**.

3. The Licence shall remain in force till **02/01/2025 .**

4. Maximum No of contract labour proposed to be employed in the establishment on any date : **50 nos.**

5. VALID FOR **ALL OVER ASSAM**, and only for the purpose mentioned in this certificate.

6. Payment Details:

GRN	AS006817586202324P
CIN	10004672023122807118
Txn Date	28/12/2023
Amount	500.00
Status	Y

(Scan the QR Code for authentification)

Office of the Commissionerate of Labour
Licensing Officer

*** This is a computer generated certificate and it does not require a Signature/Seal.***
Terms & Conditions of this Certificate is enclosed as Annexure-I.

STOP CHILD LABOUR

Reference No: LCFORMIVCL/2023/24708 To View: https://eodb.assam.gov.in/t/9qMw/F7AA683C Token No: F7AA683C

Annexure 7 Forest Royalty Payment CP-1

Annexure 8 NOC from CGWA

भारत सरकार
जल शक्ति मंत्रालय
जल संसाधन, नदी विकास
और गंगा संरक्षण विभाग
केन्द्रीय भूमि जल प्राधिकरण
Government of India
Ministry of Jal Shakti
Department of Water Resources,
River Development & Ganga Rejuvenation
Central Ground Water Authority

(भूजल निकासी हेतु अनापत्ति प्रमाण पत्र)
NO OBJECTION CERTIFICATE (NOC) FOR GROUND WATER ABSTRACTION

Project Name:	Lower Kopili Hydroelectric Project		
Project Address:	Longku, Near Pmc Colony		
Village:	Lanku	Block:	Diyungbra
District:	Dima Hasao	State:	Assam
Pin Code:			
Communication Address:	Longku, Near Pmc Colony, Diyungbra, Dima Hasao, Assam - 788931		
Address of CGWB Regional Office :	Central Ground Water Board North Eastern Region, Betkuchi, Opposite Isbt,, Nh-37, Guwahati,, Kamrup Metro, Assam - 781035		

1.	**NOC No.:**	CGWA/NOC/INF/ORIG/2023/19696	2.	**Date of Issuence**	22/12/2023
3.	Application No.:	21-4/3071/AS/INF/2023	4.	Category: (GWRE 2022)	Safe
5.	Project Status:	New Project	6.	NOC Type:	New
7.	**Valid from:**	22/12/2023	8.	**Valid up to:**	21/12/2028

9. Ground Water Abstraction Permitted:

Fresh Water		Saline Water		Dewatering		Total	
m³/day	m³/year	m³/day	m³/year	m³/day	m³/year	m³/day	m³/year
29.00	10285.00						

10. Details of ground water abstraction /Dewatering structures

	Total Existing No.:0						Total Proposed No.:1					
	DW	DCB	BW	TW	MP	MPu	DW	DCB	BW	TW	MP	MPu
Abstraction Structure*	0	0	0	0	0	0	0	0	0	1	0	0

*DW- Dug Well; DCB-Dug-cum-Bore Well; BW-Bore Well; TW-Tube Well; MP-Mine Pit;MPu-Mine Pumps

11.	Ground Water Abstraction/Restoration Charges paid (Rs.):	10285.00
12.	Environment Compensation (if applicable) paid (Rs.):	0.00

13.	Number of Piezometers(Observation wells) to be constructed/ monitored & Monitoring mechanism.	No. of Piezometers	Monitoring Mechanism		
			Manual	DWLR**	DWLR With Telemetry
	**DWLR - Digital Water Level Recorder	1	1	0	0

(Compliance Conditions given overleaf)

This is an auto generated document & need not to be signed.

Validity of this NOC shall be subject to compliance of the following conditions:

Mandatory conditions:

1) Installation of tamper proof digital water flow meter with telemetry on all the abstraction structure(s) shall be mandatory for all users seeking No Objection Certificate and intimation regarding their installation shall be communicated to the CGWA within 30 days of grant of No Objection Certificate.

2) Proponents shall mandatorily get water flow meter calibrated from an authorized agency once in a year.

3) Construction of purpose-built observation wells (piezometers) for ground water level monitoring shall be mandatory as per Section 14 of Guidelines. Water level data shall be made available to CGWA through web portal. Detailed guidelines for construction of piezometers are given in Annexure-II of the guidelines.

4) Proponents shall monitor quality of ground water from the abstraction structure(s) once in a year. Water samples from bore wells/ tube wells / dug wells shall be collected during April/May every year and analysed in NABL accredited laboratories for basic parameters (cations and anions), heavy metals, pesticides/ organic compounds etc. Water quality data shall be made available to CGWA through the web portal.

5) In case of mining projects, additional key wells shall be established in consultation with the Regional Director, CGWB for ground water level monitoring four (4) times a year (January, May, August and November) in core as well as buffer zones of the mine.

6) In case of mining project the firm shall submit water quality report of mine discharge/ seepage from Govt. approved/ NABL accredited lab.

7) The firm shall report compliance of the NOC conditions online in the website (www.cgwa-noc.gov.in) within one year from the date of issue of this NOC.

8) Industries abstracting ground water in excess of 100 m 3 /d shall undertake annual water audit through certified auditors and submit audit reports within three months of completion of the same to CGWA. All such industries shall be required to reduce their ground water use by at least 20% over the next three years through appropriate means.

9) Application for renewal can be submitted online from 90 days before the expiry of NOC. Ground water withdrawal, if any, after expiry of NOC shall be illegal & liable for legal action as per provisions of Environment (Protection) Act, 1986.

10) This NOC is subject to prevailing Central/State Government rules/laws/norms or Court orders related to construction of tube well/ground water abstraction structure / recharge or conservation structure/discharge of effluents or any such matter as applicable.

General conditions:

11) No additional ground water abstraction and/or de-watering structures shall be constructed for this purpose without prior approval of the Central Ground Water Authority (CGWA).

12) The proponent shall seek prior permission from CGWA for any increase in quantum of groundwater abstraction (more than that permitted in NOC for specific period).

13) Proponents shall install roof top rain water harvesting in the premise as per the existing building bye laws in the premise.

14) The project proponent shall take all necessary measures to prevent contamination of ground water in the premises failing which the firm shall be responsible for any consequences arising thereupon.

15) In case of industries that are likely to contaminate the ground water, no recharge measures shall be taken up by the firm inside the plant premises. The runoff generated from the rooftop shall be stored and put to beneficial use by the firm.

16) Wherever feasible, requirement of water for greenbelt (horticulture) shall be met from recycled / treated waste water.

17) Wherever the NOC is for abstraction of saline water and the existing wells (s) is /are yielding fresh water, the same shall be sealed and new tubewell(s) tapping saline water zone shall be constructed within 3 months of the issuance of NOC. The firm shall also ensure safe disposal of saline residue, if any.

18) Unexpected variations in inflow of ground water into the mine pit, if any, shall be reported to the concerned Regional Director, Central Ground Water Board.

19) In case of violation of any NOC conditions, the applicant shall be liable to pay the penalties as per Section 16 of Guidelines.

20) This NOC does not absolve the proponents of their obligation / requirement to obtain other statutory and administrative clearances from appropriate authorities.

21) The issue of this NOC does not imply that other statutory / administrative clearances shall be granted to the project by the concerned authorities. Such authorities would consider the project on merits and take decisions independently of the NOC.

22) In case of change of ownership, new owner of the industry will have to apply for incorporation of necessary changes in the No Objection Certificate with documentary proof within 60 days of taking over possession of the premises.

23) This NOC is being issued without any prejudice to the directions of the Hon'ble NGT/court orders in cases related to ground water or any other related matters.

24) Proponents, who have installed/constructed artificial recharge structures in compliance of the NOC granted to them previously and have availed rebate of upto 50% (fifty percent) in the ground water abstraction charges/ground water restoration charges, shall continue to regularly maintain artificial recharge structures.

25) Industries which are likely to cause ground water pollution e.g. Tanning, Slaughter Houses, Dye, Chemical/ Petrochemical, Coal washeries, pharmaceutical, other hazardous units etc. (as per CPCB list) need to undertake necessary well head protection measures to ensure prevention of ground water pollution as per Annexure III of the guidelines.

26) In case of new infrastructure projects having ground water abstraction of more than 20 m3/day, the firm/entity shall ensure implementation of dual water supply system in the projects.

27) In case of infrastructure projects, paved/parking area must be covered with interlocking/perforated tiles or other suitable measures to ensure groundwater infiltration/harvesting.

28) In case of coal and other base metal mining projects, the project proponent shall use the advance dewatering technology (by construction of series of dewatering abstraction structures) to avoid contamination of surface water.

29) The NOC issued is conditional subject to the conditions mentioned in the Public notice dated 27.01.2021 failing which penalty/EC/cancellation of NOC shall be imposed as the case may be.
30) This NOC is issued subject to the clearance of Expert Appraisal Committee (EAC) (if applicable).
31) In the self-compliance report, the PP shall submit details of Drilling Agency/ Agencies, which has/ have constructed BW(s)/ TW(s) along with undertaking to the effect that all necessary measures have been taken as per directions of Hon'ble Supreme Court provided in Annexure-VII of guidelines dated 24.09.2020 in respect of abandoned/ failed BW(s)/ TW(s)/Piezometer(s), if any. The PP is advised to engage registered drilling agency/ agencies. In the event of any mishap/ unfortunate incident due to negligence in taking measures for prevention of accident due to falling in Bore Well, both PP and concerned drilling agency shall jointly be held responsible and penal action as per extant Government rules shall be taken.

(Non-compliance of the conditions mentioned above is likely to result in the cancellation of NOC and legal action against the proponent.)

Annexure 9 NOC form Gaon Bura for extraction of surface water (CP-4)

ASSAM POWER GENERATION CORPORATION LIMITED

220Kv D/C Lower Kopil Hydro Electric project to Sankardev Nagar Transmission Line

SURFACE WATER DECLARATION

I have given the river / Pond / pumps surface water which is needed for the APGCL construction work in ..Chota Langphar......................., location no..78A/0, 79/0, 79A/0 ...80/0, 81/0.......... Our village has no claim this project construction work.

অথবা

মই নদী / পুখুৰী / পাম্পৰ পৃষ্ঠৰ পানী দিছো যিটো APGCL নির্মাণৰ কামৰ বাবে প্ৰয়োজনীয় ...., স্থান নং. .... আমাৰ গাঁৱৰ কোনো দাবী নাই এই প্ৰকল্প নির্মাণৰ কাম|

R. Rongphar
Sri Rajit Rongpher
S.G.B Of Choto-Langphor village
Umrangso Dima Hasao
GB SIGNATURE WITH SEAL

VILLAGE WITNESS
1. KaLHE Tesompi
2. SiKARi RongPHAR

ASSAM POWER GENERATION CORPORATION LIMITED

220Kv D/C Lower Kopil Hydro Electric project to Sankardev Nagar Transmission Line

SURFACE WATER DECLARATION

I have given the river / Pond / pumps surface water which is needed for the APGCL construction work in Chota Langphar......................, location no. 75/0, 76/0 78/0.................. Our village has no claim this project construction work.

অথবা

মই নদী / পুখুৰী / পাম্পৰ পৃষ্ঠৰ পানী দিছো যিটো APGCL নির্মাণৰ কামৰ বাবে প্রয়োজনীয় ...., স্থান নং. .... আমাৰ গাঁৱৰ কোনো দাবী নাই এই প্রকল্প নির্মাণৰ কাম|

R. Rongphar

Sri Rajit Rongpher

S.G.B Of Choto-Langpher village

Umrangso Dima Hasao

GB SIGNATURE WITH SEAL

VILLAGE WITNESS

1. Monjari Hanse

2. Babita Nunisa

3. Priya Rongphar

ASSAM POWER GENERATION CORPORATION LIMITED

220Kv D/C Lower Kopil Hydro Electric project to Sankardev Nagar Transmission Line

SURFACE WATER DECLARATION

I have given the river / Pond / pumps surface water which is needed for the APGCL construction work in Chota Langphen......................, location no. 75/0, 76/0 78/0.................. Our village has no claim this project construction work.

অথবা

মই নদী / পুখুৰী / পাম্পৰ পৃষ্ঠৰ পানী দিছো যিটো APGCL নিৰ্মাণৰ কামৰ বাবে প্ৰয়োজনীয় ...., স্থান নং. .... আমাৰ গাঁৱৰ কোনো দাবী নাই এই প্ৰকল্প নিৰ্মাণৰ কাম।

R. Rongphar
Sri Rajit Rongpher
S.G.B Of Choto-Langpher village
Umrangso Dima Hasao
GB SIGNATURE WITH SEAL

VILLAGE WITNESS

1. Mon Jorzi Hanse
2. Babita Nunisa
3. Priya Rongpher

ASSAM POWER GENERATION CORPORATION LIMITED

220Kv D/C Lower Kopil Hydro Electric project to Sankardev Nagar Transmission Line

SURFACE WATER DECLARATION

I have given the river / Pond / pumps surface water which is needed for the APGCL construction work in Chota Langphor......................., location no. 75/0, 76/0 ...78/0.................. Our village has no claim this project construction work.

অথবা

মই নদী / পুখুৰী / পাম্পৰ পৃষ্ঠৰ পানী দিছো যিটো APGCL নিৰ্মাণৰ কামৰ বাবে প্ৰয়োজনীয় ...., স্থান নং. .... আমাৰ গাঁৱৰ কোনো দাবী নাই এই প্ৰকল্প নিৰ্মাণৰ কাম|

R. Rongphar
Sri Rajit Rongpher
S.GB Of Choto-Langpher village
Umrangso Dima Hasao
GB SIGNATURE WITH SEAL

VILLAGE WITNESS

1. Mon Jarzi Hanse
2. Babita Nunisa
3. Priya Rongphar

ASSAM POWER GENERATION CORPORATION LIMITED

220Kv D/C Lower Kopil Hydro Electric project to Sankardev Nagar Transmission Line

SURFACE WATER DECLARATION

I have given the river / Pond / pumps surface water which is needed for the APGCL construction work in ...Lanari....., location no...57/2..,58/0, 60/1..60/2..61/0.... Our village has no claim this project construction work.

অথবা

মই নদী / পুখুৰী / পাম্পৰ পৃষ্ঠৰ পানী দিছো যিটো APGCL নির্মাণৰ কামৰ বাবে প্রয়োজনীয়
....., স্থান নং.
..... আমাৰ গাঁৱৰ কোনো দাবী নাই এই প্রকল্প নির্মাণৰ কাম।

P. Kemprai
G.B. of Langhi-1
Diyungbra Diyung Hasao

GB SIGNATURE WITH SEAL

VILLAGE WITNESS
1. Krishna Kemprai
2. Mohan Hojai
3. Soronjoy Kemprai

ASSAM POWER GENERATION CORPORATION LIMITED

220Kv D/C Lower Kopil Hydro Electric project to Sankardev Nagar Transmission Line

SURFACE WATER DECLARATION

I have given the river / Pond / pumps surface water which is needed for the APGCL construction work in ...Langari – 1,2..........................., location no...61/A/0...62/0 ..63/0..64/0...65/0 Our village has no claim this project construction work.

অথবা

মই নদী / পুখুৰী / পাম্পৰ পৃষ্ঠৰ পানী দিছো যিটো APGCL নির্মাণৰ কামৰ বাবে প্রয়োজনীয় ...., স্থান নং. .... আমাৰ গাঁৱৰ কোনো দাবী নাই এই প্রকল্প নির্মাণৰ কাম।

P. Kemprai
G.B. of ...
Diyungbra, Dima Hasao

GB SIGNATURE WITH SEAL

VILLAGE WITNESS

1. Kabilra Nunisa

2. Puljadi Kemprai

ASSAM POWER GENERATION CORPORATION LIMITED

220Kv D/C Lower Kopil Hydro Electric project to Sankardev Nagar Transmission Line

SURFACE WATER DECLARATION

I have given the river / Pond / pumps surface water which is needed for the APGCL construction work in ...Tharne...thepo....., location no...57/1, 58/0 ..58/1, 59/0, 59/1. Our village has no claim this project construction work.

অথবা

মই নদী / পুখুৰী / পাম্পৰ পৃষ্ঠৰ পানী দিছো যিটো APGCL নির্মাণৰ কামৰ বাবে প্রয়োজনীয়

....., স্থান নং.

..... আমাৰ গাঁৱৰ কোনো দাবী নাই এই প্রকল্প নির্মাণৰ কাম|

GB SIGNATURE WITH SEAL

GB of
Village- THARVE-THEPO
Diyungbra,Dima Hasao

VILLAGE WITNESS,

1. umesh Kemprai

2. Baburam Engti

ICICI Lombard
Nibhaye Vaade

ICICI Lombard General Insurance Company LTD
ICICI LOMBARD HOUSE, 414, Veer Savarkar Marg,
Near Siddhi Vinayak Temple, Prabhadevi, Mumbai 400 025

WORKMAN COMPENSATION INSURANCE

UIN- IRDAN115CP0017V01201920 Misc 10

POLICY SCHEDULE

Policy No. 4010/252569944/01/000 (TRUE COPY) Issued at MUMBAI

1. Name of the Insured: M/S SALASAR TECHNO ENGINEERING LTD
2. Address of the Insured: 2nd Floor, 205, Amrit Enclave, Ganapati Nagar
   Lalganesh Guwahati, Kamrup
   Kamrup
   Assam Pin- 781034
3. Intermediary Details:

Agency Code1:	**DB33106**
Agency Name:	**WORLDWIDE INSURANCE BROKERS LTD**
Agent's mobile no.:	**9716640000**
Agent's landline no:	**120-**
Agent's E-mail ID :	**POLICY@WIBL.IN**

4. Total Sum Insured: 96,12,000.00
5. Scope of cover:

Main Coverage: WC Liability Cover Table 'A'

Extensions

Endorsement

(i) Table A: Coverage provided is Indemnity against legal liability for accidents to employees under the Workmen's Compensation Act, 1923 and subsequent amendments of the said Act prior to the date of the issue of the policy; The Fatal Accidents Act 1855 and at Common Law only

Exclusions:

(i)	Any employment compensation in excess of the actual sum insured for workmen compensation ordinance (not to apply in respect of common law awards).
(ii)	Underground and/or underwater mines and/or underground services in connection therewith. However, this exclusion shall only apply where more than 20 people are working at the same location at any one time.
(iii)	Subaqueous work (underwater work).
(iv)	Quarries, where explosives are used.
(v)	Contractors engaged exclusively in wrecking or demolition of building and/or scrap metal merchants.
(vi)	Aircraft crews in respect of flight risk. However, this exclusion shall not apply to aircraft which are set aside for non fare paying executive use and which are crewed by six persons or less.
(vii)	Ship crews other than on inland vessels or on vessels operating within territorial waters. However, this exclusion shall not apply to a vessel crewed by six persons or less.
(viii)	Fire bridges other than those formed privately for loss prevention purposes.
(ix)	Service in any kind of armed forces (including, but not limited to military, police, security services).
(x)	Operation of railways, other than sidings.
(xi)	Employees employed on a permanent basis in USA and/or Canada.
(xii)	Professional sports team.
(xiii)	Fire crackers manufacturing activity
(xiv)	Losses suffered in the course of manufacturing and /or supplying and/or producing storing, filling, breaking down,

	transporting:- (a) Fireworks, ammunition, fuses, cartridges, powder, nitro-glycerine, or any explosives. (b) Gases and/or air under pressure in containers. (c) Butane, methane, propane, and other liquefied gases. (d) Celluloid and pyroxylin. (e) Petrochemicals and also chemicals of a toxic (as defined under India?s Public Liability Act 1991), noxious, explosive and/or highly flammable nature. (f) Asbestos and/or asbestos products. (It is understood and agreed, however, that the storage, transport and/or handling if any of the substances above mentioned other than f) which is merely incidental to the operation and/or trade of the Insured not otherwise excluded, is covered.)
(xv)	Losses suffered on or in connection with offshore rigs.
(xvi)	Any compensation in medical extension expenses if the injured is hospitalized for more than 12 month due to an accident as per the coverage opted in WC policy
(xvii)	Pandemics/epidemics as declared by WHO and / or Government of India

Conditions:

(i)	Policy for Table A only
(ii)	Electric Cables, Makers and suppliers of incl. Cablelaying, installation and Erection work:All work away from shop or yard
(iii)	No. of lives: 50
(iv)	Risk Classification code: 135
(v)	Sub Contractors are Covered
(vi)	Policy is issued on unnamed basis.
(vii)	Entry age limit:As per WC Act
(viii)	Risk Location Address:Assam Power Generation Corporation Limited,Bijulee Bhawan, Floor, Paltanbazar,KAMRUP,781001,ASSAM,INDIA,
(ix)	Name of the Principal Assam Power Generation Corporation Limited, Guwahati, Nature of Work Construction of 220 KV Double Circuit Transmission Line from Lower Kopili Hydroelectric Project to Sankardev Nagar Grid Substation on Turnkey Basis & various contractors and sub contractors Sub-Contractors of every tier, Consultants and Engineers and / or Associated and / or Subsidiary Companies, for their respective rights & interests Expiring Policy No.4010/252569944/00/000

Nature of work/activity	
Policy type	UNNAMED
Entry age limit	As per WC Act
Policy cover	table A
Risk classification code	135 , 135 , 135
No of lives	50

6. Period of Insurance: From: 12/07/2023 Time: 00:00 Hours
To Midnight of 11/07/2024

7. Premium Calculations

Premium Break Up	(Rs.)	Premium (Rs.)
Stamp Duty	(Rs.)	25.00
*Total Premium	(Rs.)	58,267.44

*Premium value mentioned above is inclusive of taxes applicable

8. Details of workmen to be insured

Estimated Number of Employees	Occupation of Employees	Estimated Total Salaries Wages and other money earnings	Estimated Total Earnings for the Policy Duration	Place or Places of Employment	Industry Classification	Sub Industry Classification	Risk Classification Code
10	Skilled	18,600.00	22,32,000.00	ASSAM POWER	Electric Cables,	All work	135

	Workers			GENERATION CORPORATION LIMITED--BIJULEE BHAWAN, FLOOR, PALTANBAZAR------ ASSAM--KAMRUP--781001	Makers and suppliers of incl. Cablelaying, installation and Erection work	away from shop or yard	
30	Semi Skilled Workers	15,500.00	55,80,000.00	ASSAM POWER GENERATION CORPORATION LIMITED--BIJULEE BHAWAN, FLOOR, PALTANBAZAR------ ASSAM--KAMRUP--781001	Electric Cables, Makers and suppliers of incl. Cablelaying, installation and Erection work	All work away from shop or yard	135
10	Unskilled Workers	15,000.00	18,00,000.00	ASSAM POWER GENERATION CORPORATION LIMITED--BIJULEE BHAWAN, FLOOR, PALTANBAZAR------ ASSAM--KAMRUP--781001	Electric Cables, Makers and suppliers of incl. Cablelaying, installation and Erection work	All work away from shop or yard	135
Total: 50			Total: 96,12,000.00				

Subject otherwise to terms and conditions of Workman's Compensation Insurance Policy

Signed for and on behalf of the ICICI Lombard General Insurance Company limited, at Mumbai on this date 11/07/2023.

The Policy shall stand cancelled ab initio in the event of non-realization of premium.

Authorized Signatory
ICICI Lombard General Insurance Company Ltd.

GSTIN Reg. No: 07AAACI7904G1ZP
IL GIC GSTIN Address : Fourth Parsavnath Capital Tower Bhai Veer Singh Marg, New Delhi New Delhi 110001
HSN/SAC code : 997139 - GENERAL INSURANCE SERVICES

"The stamp duty of Rs. 25.00 paid in cash or by demand draft or by pay order, vide Reciept/challan no. CSD6142023662 dated 20/02/2023."

Annexure 11 Detail report and fitness certificate of the person (Non work Related accident)-CP-2

L&T Construction	Larsen & Toubro Limited Heavy Civil Infrastructure Independent Company	L&T LIFE Live Injury Free Each day

IM: 23 A

24 Hour PRELIMINARY INCIDENT REPORT

1. Details of the Project	
Name of the Project & Job Number: LE200685 - 120 MW Lower Kopili HEP	Business Unit: Hydel and Tunnel
Site Engineer (with P.S. No): PRANJIT SAVAPANDIT (198024)	Section In-charge (with P.S. No): Srinivasan Kalyan (PS 10007796)
P&M Incharge (if P&M related incident): NA	Name of the Chief EHS Manager: Tushar Gangopadhyay
Name of the Project Head: Santanu Majumdar	Name of Subcontractor / Vendor code: -

2. Category of Incident (Tick as applicable)		
Major Incidents	Category 1	☐ Fatality
	Category 2	☐ Reportable Lost Time Injury (Non-fatal > 48 hours)
	Category 3	☐ Dangerous Occurrence
	Category 4	☐ Reportable Sick Case
	Category 5	☐ Major Environment
	-	☒ Non-Work-Related Incident (not included in statistics)

3. Details of the Incident (Write N.A if not applicable)

Name of the Injured	Age	Sex	Designation	Nature of Injury
Shri Ananga Kumar Dey	55	Male	Office Assistant	Facture

Date & Time of Incident:	04.06.23 around 04:30 PM
Exact Location where the Incident occurred:	**Main road near Lanka Office.**

Describe briefly how the incident occurred:
The IP was going to office (nearby our Lanka Office) by cycle, during crossing the road, unexpectedly one outsider motorbike hit him from the back side. IP got injury on Left Hand, immediately send to near by Hospital, after medical check-up it found Facture.

First Aid treatment details: Immediately shifted to Near Hospital

Name of the Witnesses: - NA

Immediate Action taken to prevent recurrence: NA

Please insert relevant photographs below:	
To describe the incident site: Long shot Not available	**Incident scene** Not available
[Photo No. & photo description]	[Photo No. & photo description]
Close view of damage / abnormal condition Not Available	**Close view 2 of damage / abnormal condition / Sketch** Not available
[Photo No. & photo description]	[Photo No. & photo description]
Name of the Site Engineer: PRANJIT SAVAPANDIT PS No : 198024	Signature: P. Savap.
Project Head signature: Sandeep Majgaonkar	EHS Engineer signature:
Forward the Incident Investigation Report to • Cluster Head & Cluster ESHS Head • BU Head & Segment Head • IC ESHS Head, ehsinfra@lntecc.com and Head – Admin Services	

Fitness Certificate

Haji Abdul Majid Memorial Hospital & Research Centre
[UNIT OF HAJI ABDUL MAJID MEMORIAL PUBLIC TRUST]
Hojai, Nagaon,Assam,

08.07.23

TO WHOM IT MAY CONCERN

Provisional

Hosp.No.- 1711394

This is to certify that Mr. Ananga Kumar Dey, 56yrs, Male, S/O- Late Akhay Dey , Address : Vill- Lanka, Hojai, Assam was an OPD patient in this hospital under my care . .

He has been examined by me today and found fit to resume light duties.

Dr. B. Hanse, MS, Ortho
Orthopaedic Specialist
R. No.- 19419

Dr. B.Hanse,MS
Consultant Orthopaedic Surgeon.

Annexure 12. Noise Monitoring Results

Test Results of CP-1

n-VISION
Enviro Technologies North East
Technologies for better tomorrow

TC-7669

Recognized by Pollution Control Board, Assam

TEST REPORT

AMBIENT NOISE LEVEL MEASUREMENT REPORT
Rep.No. ANLMR_.1503282_01_268
Sample ID: EETNE/AUG/06/23

Date: 31/08/2023
ULR NO.: TC766923000000051F

Issued to : M/s. BVG India Ltd. Midas Tower 4th Floor, Rajiv Gandhi Infotech Park, Phase 1-Hinjawani,Pune-411057

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)	23/08/23	Package 1 Lat N 25°88'03.52" Long E 92°80'49.47"	57.2	40.6

Remarks: Noise level is carried out during 75% of the Day Time & Night Time.
Method of analysis : IS 9989 : 1981 RA : 2014
Sampling Instrument Used : SLM100 SLNO484-I-22, SLM 100 (213 DTC-2013)

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

Ambient Noise Standards:

FOR ENVISION ENVIRO TECHNOLOGIES NORTH EAST, GUWAHATI

Khairul Islam Sheikh
(Environmental Chemist)

Utpal Bezbaruah
(Technical Manager)
Authorized Signatory /Reviewed by

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.

----------END OF REPORT---------

Page 1 of 1

House No. 6, 1st Floor, Sankardev Path, Pub-Sarania, Chandmari, Guwahati-781003, Assam

Phone : +91 98640 10097 / 70026 10116 ◆ e-mail : envisionghy@gmail.com

Noise Monitoring Results of CP-2

en-vision
Enviro Technologies North East
Technologies for better tomorrow

Recognized by Pollution Control Board, Assam

TC-7669

TESTREPORT

AMBIENT AIR ANALYSIS REPORT
Rep.No. AAAR_1503163_01_ 394(B) **Date: 11/12/2023**
Sample ID: EETNE/NOV/07(B)/23 **ULR NO.: TC766923000000085(B)F**
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 : 28/11/23 TO 02/12/23, 29/11/23 TO 03/12/23, 30/11/23 TO 04/12/23 01/12/23 TO 05/12/23, 02/12/23 TO 06/12/23 03/12/23 TO 07/12/23, 04/12/23 TO 08/12/23, 05/12/23 TO 09/12/23
Sampling Instrument Used : AMBIENT AIR SAMPLER/RDS/CO Monitor/HC gas Monitor
Pollution Control Device, if any : NO

SL. NO	DATE OF SAMPLING	LOCATION/ SOURCE (Latitude & Longitude)	WEATHER	PARAMETERS					
				PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	HC (mg/m^3)	CO (mg/m^3)	SO_2 ($\mu g/m^3$)
i)	28/11/23	Power Inlet / Dam Site Lat N 25°39'57.39" Long E 92°46'53.62"	Clear	36.2	24.5	15.6	BDL	BDL	10.9
ii)	29/11/23	Crusher Site Lat N 25°40'37.79" Long E 92°47'43.13"		52.7	30.7	18.6	0.03	0.06	12.9
iii)	30/11/23	HRT Adit Lat N 25°40'47.89" Long E 92°48'9.67"		35.2	17.9	12.1	BDL	BDL	9.2
iv)	01/12/23	Primary Hospital Near APGCL Camp Lat N 25°39'59.93" Long E 92°47'45.52""		30.7	21.5	11.6	BDL	BDL	10.6
v)	02/12/23	Batching plant Lat N 25°41'45.31" Long E 92°48'39.79"		35.2	25.7	15.8	BDL	BDL	9.8
vi)	03/12/23	Surge Shaft Site Lat N 25°41'29.28" Long E 92°48'16.47"		32.9	24.7	14.7	BDL	BDL	11.6
vii)	04/12/23	Labour & Staff Camp Lat N 25°40'54.97" Long E 92°48'9.67"		33.8	20.1	13.6	BDL	BDL	9.7
viii)	05/12/23	Power house Lat N 25°41'54.02" Long E 92°46'53.62"		36.7	24.6	11.7	BDL	BDL	9.8

Remarks: - Sampling were done within the annual based.

Page 1 of 1

House No. 6, 1st Floor, Sankardev Path, Pub-Sarania, Chandmari, Guwahati-781003, Assam.
Mobile : +91 98592 32126 / 88110 96201 ✉ e-mail : envisionghy@gmail.com

NATIONAL AMBIENT AIR QUALITY STANDARDS:

Sl. No.	Pollutant	Test Method	Time Weighted Average	Concentration in Ambient Air: Industrial, Residential, Rural and Other Area
1	Particulate Matter (PM_{10}), $\mu g/m^3$	IS:5182 Part-XXIII/ CPCB	Annual	60
			24 hours	100
2	Particulate Matter ($PM_{2.5}$), $\mu g/m^3$	EETNE/SOP/01/2017	Annual	40
			24 hours	60
3	Nitrogen Dioxide (NO_2), $\mu g/m^3$	IS:5182 Part-VI/ CPCB	Annual	40
			24 hours	80
4	Carbon Monoxide (CO), mg/m^3		8 Hours	2.0
5	Sulphur Dioxide (SO_2), $\mu g/m^3$	IS:5182 Part-II/ CPCB	Annual	50
			24 hours	80

For Envision Enviro Technologies North East, Guwahati

Khairul Islam Sheikh
(Environmental Chemist)

Utpal Bezbaruah
(Technical Manager)
Authorized Signatory /Reviewed by

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.

---------- END OF REPORT----------

House No. 6, 1st Floor, Sankardev Path, Pub-Sarania, Chandmari, Guwahati-781003, Assam.
Mobile : +91 98592 32126 / 88110 96201 ♦ e-mail : envisionghy@gmail.com

Noise Monitoring of CP-3

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TEST REPORT

AMBIENT NOISE LEVEL MEASUREMENT REPORT

Rep.No. ANLMR_1503163_06A_277 Date: 31/08/2023
Sample ID: EETNE/AUG/11/23 ULR NO.: TC766923000000856F

Issued to : M/s. Andritz Hydro Pvt. Ltd., LKHEP Project, village – Longku, Dist. Dima Hasao, Pin - 788931

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)	26/08/23	Near Service Bay	60.9	47.9
ii)	27/08/23	Near Valve House	57.2	42.9
iii)	28/08/23	Near Project Camp	58.3	46.7

Remarks: Noise level is carried out during 75% of the Day Time & Night Time.
Method of analysis : CPCB July 2015 guideline.
Sampling Instrument Used : SLM100 SLNO484-I-22, SLM 100 (213 DTC-2013)

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

Khairul Islam Sheikh
(Environmental Chemist)

Utpal Bezbaruah
(Technical Manager)
Authorized Signatory /Reviewed by

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.

----------END OF REPORT----------

Page 1 of 1

House No. 6 1st Floor, Sankardev Path, Pub-Sarania, Chandmari, Guwahati-781003, Assam.
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Noise Monitoring of CP-4

ABNS SCIENTIFIC SERVICES

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৩, গুৱাহাটী ৩৮১০৩৩, অসম

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TC-10736

TEST REPORT

ULR Number: TC1073623000000718F | **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED

2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,

LALGANESH GUWAHATI, KAMPUP(M),

GUWAHATI-781034. ASSAM

Sample Description: Noise Level | **Location: Near Lalungdubi Gaon**

Date of Sample on: 23/12/2023 | **(latitude:** 25.891238°N, **longitude:** 92.922180°E)

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Method	Unit	Result
1	LeqdB (A) Day	IS: 9989: 1981(Reaff:2014)	dB(A)	**39.2**
2	Leq dB (A) Night	IS: 9989: 1981(Reaff:2014)	dB(A)	**34.7**

Ambient Noise Standards:

Area Code	Category of Area	Limit in dB(A) Leq Day time	Night time
A.	Industrial area	75	70
B.	Commercial area	65	55
C.	Residential area	55	45
D.	Silence Zone	50	40

Note: *The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

ABNS Scientific Services Guwahati, Assam

31/12/2023

Authorized Signatory

(Dr. Mayur Jyoti Mahanta)

ABNS SCIENTIFIC SERVICES
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এবীএননএস সাইংটীফীক সর্বীসেজ
H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam
কেতেকী পথ, ৰেডিছন ব্লু কে পাছ, এন এইচ ২৭, গুৱাহাটী ৭৮১০৩৩, অসম
Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951
TC-10736

TEST REPORT

ULR Number: TC1073623000000719F | **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: Noise Level | **Location: Near 37/1**

Date of Sample on: 23/12/2023 | **(latitude:** 25.854547°N, **longitude:** 92.92056°E)

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Method	Unit	Result
1	LeqdB (A) Day	IS: 9989: 1981(Reaff:2014)	dB(A)	**42.1**
2	Leq dB (A) Night	IS: 9989: 1981(Reaff:2014)	dB(A)	**36.3**

Ambient Noise Standards:

Area Code	Category of Area	Limit in dB(A) Leq Day time	Limit in dB(A) Leq Night time
A.	Industrial area	75	70
B.	Commercial area	65	55
C.	Residential area	55	45
D.	Silence Zone	50	40

***Note**: The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023
Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

ABNS SCIENTIFIC SERVICES

এবিএনএচ চাইন্টিফিক চার্ভিচেচ

এবীএনএস সাইंटीफीक सर्वीसेज

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

केतेकी पथ, रैडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TC-10736

TEST REPORT

ULR Number: TC1073623000000720F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED

2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,

LALGANESH GUWAHATI, KAMPUP(M),

GUWAHATI-781034. ASSAM

Sample Description: Noise Level	**Location: Near 58/0**
Date of Sample on: 24/12/2023	**(latitude:** 25.852443°N, **longitude:** 92.926585°E)

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Method	Unit	Result
1	LeqdB (A) Day	IS: 9989: 1981(Reaff:2014)	dB(A)	**43.3**
2	Leq dB (A) Night	IS: 9989: 1981(Reaff:2014)	dB(A)	**37.5**

Ambient Noise Standards:

Area Code	Category of Area	Limit in dB(A) Leq Day time	Night time
A.	Industrial area	75	70
B.	Commercial area	65	55
C.	Residential area	55	45
D.	Silence Zone	50	40

***Note**: The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

Authorized Signatory

(Dr. Mayur Jyoti Mahanta)

ABNS SCIENTIFIC SERVICES

এবিএনএচ চাইেন্টিফিক চার্ভিচেচ

এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, রেডিসন ব্লু কে পাস, এন এইচ ২৭, গুবাহাটী ৭৮১০৩৩, অসম

TC-10736

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC1073623000000721F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED

2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,

LALGANESH GUWAHATI, KAMPUP(M),

GUWAHATI-781034. ASSAM

Sample Description: Noise Level **Location: Near 87/0**

Date of Sample on: 24/12/2023 **(latitude:** 25.69671°N, **longitude:** 92.806532°E)

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Method	Unit	Result
1	LeqdB (A) Day	IS: 9989: 1981(Reaff:2014)	dB(A)	42.2
2	Leq dB (A) Night	IS: 9989: 1981(Reaff:2014)	dB(A)	34.1

Ambient Noise Standards:

Area Code	Category of Area	Limit in dB(A) Leq Day time	Night time
A.	Industrial area	75	70
B.	Commercial area	65	55
C.	Residential area	55	45
D.	Silence Zone	50	40

Note: *The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

Authorized Signatory

(Dr. Mayur Jyoti Mahanta)

ABNS SCIENTIFIC SERVICES

এবিএনএচ চাইন্টিফিক চার্ভিচেচ

এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৭, গুৱাহাটী ৭৮১০৩৩, অসম

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TC-10736

TEST REPORT

ULR Number: TC1073623000000722F | **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED

2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,

LALGANESH GUWAHATI, KAMPUP(M),

GUWAHATI-781034. ASSAM

Sample Description: Noise Level

Date of Sample on: 24/12/2023

Location: Near AP 1/0

(latitude: 25.985313°N, **longitude:** 92.924824°E)

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Method	Unit	Result
1	LeqdB (A) Day	IS: 9989: 1981(Reaff:2014)	dB(A)	59.2
2	Leq dB (A) Night	IS: 9989: 1981(Reaff:2014)	dB(A)	47.8

Ambient Noise Standards:

Area Code	Category of Area	Limit in dB(A) Leq Day time	Night time
A.	Industrial area	75	70
B.	Commercial area	65	55
C.	Residential area	55	45
D.	Silence Zone	50	40

Note: *The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, ASSAM

31/12/2023

Authorized Signatory

(Dr. Mayur Jyoti Mahanta)

Annexure 13 Air Quality Monitoring results

Air Quality Monitoring – CP-1

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TC-7669

TESTREPORT

AMBIENT AIR ANALYSIS REPORT
Rep.No. AAAR_1503282_01_267 Date: 31/08/2023
Sample ID: EETNE/AUG/06/23 ULR NO.: TC766923000000051F
Issued to : M/s. BVG India Ltd. Midas Tower 4th Floor, Rajiv Gandhi Infotech Park, Phase 1-Hinjawani,Pune-411057

Sample Drawn By	: UTPAL BEZBARUAH
Sampling Plan & Procedure	: EETNE/SOP/01
Analysis Duration	: 23/08/23 TO 31/08/23
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_{10} (µg/m³)	$PM_{2.5}$ (µg/m³)	NO_2 (µg/m³)	HC (mg/m³)	CO (mg/m³)	SO_2 (µg/m³)
i)	23/08/23	Package 1 Lat N 25°88'03.52" Long E 92°80'49.47"	Clear	40.5	31	16.7	BDL	BDL	9.5

Remarks: - Sampling were done within the 24hrs

NATIONAL AMBIENT AIR QUALITY STANDARDS:

Sl. No.	Pollutant	Test Method	Time Weighted Average	Concentration in Ambient Air: Industrial, Residential, Rural and Other Area
1	Particulate Matter (PM_{10}), µg/m³	IS:5182 Part-XXIII/ CPCB	Annual	60
			24 hours	100
2	Particulate Matter ($PM_{2.5}$), µg/m³	EETNE/SOP/01/2017	Annual	40
			24 hours	60
3	Nitrogen Dioxide (NO_2), µg/m³	IS:5182 Part-VI/ CPCB	Annual	40
			24 hours	80
4	Carbon Monoxide (CO), mg/m³		8 Hours	2.0
5	Sulphur Dioxide (SO_2), µg/m³	IS:5182 Part-II/ CPCB	Annual	50
			24 hours	80

For Envision Enviro Technologies North East, Guwahati

Khairul Islam Sheikh
(Environmental Chemist)

Utpal Bezbaruah
(Technical Manager)
Authorized Signatory /Reviewed by

Note: i) The results relate to the tested parameters & items sample.
ii) The test report shall not be reproduced except in full, without written approval of laboratory.

Page 1 of 1

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Air quality Monitoring – CP-2

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TC-7669

TESTREPORT

AMBIENT AIR ANALYSIS REPORT

Rep.No. AAAR_1503163_01_ 394(B) Date: 11/12/2023
Sample ID: EETNE/NOV/07(B)/23 ULR NO.: TC76692300000085(B)F
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 : 28/11/23 TO 02/12/23, 29/11/23 TO 03/12/23, 30/11/23 TO 04/12/23 01/12/23 TO 05/12/23, 02/12/23 TO 06/12/23 03/12/23 TO 07/12/23, 04/12/23 TO 08/12/23, 05/12/23 TO 09/12/23
Sampling Instrument Used : AMBIENT AIR SAMPLER/RDS/CO Monitor/HC gas Monitor
Pollution Control Device, if any : NO

SL. NO	DATE OF SAMPLING	LOCATION/ SOURCE (Latitude & Longitude)	WEATHER	PARAMETERS					
				PM_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	HC (mg/m^3)	CO (mg/m^3)	SO_2 ($\mu g/m^3$)
i)	28/11/23	Power Inlet / Dam Site Lat N 25°39'57.39" Long E 92°46'53.62"	Clear	36.2	24.5	15.6	BDL	BDL	10.9
ii)	29/11/23	Crusher Site Lat N 25°40'37.79" Long E 92°47'43.13"		52.7	30.7	18.6	0.03	0.06	12.9
iii)	30/11/23	HRT Adit Lat N 25°40'47.89" Long E 92°48'9.67"		35.2	17.9	12.1	BDL	BDL	9.2
iv)	01/12/23	Primary Hospital Near APGCL Camp Lat N 25°39'59.93" Long E 92°47'45.52""		30.7	21.5	12.6	BDL	BDL	10.6
v)	02/12/23	Batching plant Lat N 25°41'45.31" Long E 92°48'39.79"		35.2	25.7	15.8	BDL	BDL	9.8
vi)	03/12/23	Surge Shaft Site Lat N 25°41'29.28" Long E 92°48'16.47"		30.3	24.7	14.7	BDL	BDL	11.6
vii)	04/12/23	Labour & Staff Camp Lat N 25°40'54.97" Long E 92°48'9.67"		35.7	20.1	13.6	BDL	BDL	9.7
viii)	05/12/23	Power house Lat N 25°41'54.02" Long E 92°46'53.62"		36.7	24.6	11.7	BDL	BDL	9.8

Remarks: - Sampling were done within the annual based.

Page 1 of 1

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Mobile : +91 98592 72126 / 88110 96201 ♦ e-mail : envisionghy@gmail.com

NATIONAL AMBIENT AIR QUALITY STANDARDS:

Sl. No.	Pollutant	Test Method	Time Weighted Average	Concentration in Ambient Air: Industrial, Residential, Rural and Other Area
1	Particulate Matter (PM_{10}), $\mu g/m^3$	IS:5182 Part-XXIII/ CPCB	Annual	60
			24 hours	100
2	Particulate Matter ($PM_{2.5}$), $\mu g/m^3$	EETNE/SOP/01/2017	Annual	40
			24 hours	60
3	Nitrogen Dioxide (NO_2), $\mu g/m^3$	IS:5182 Part-VI/ CPCB	Annual	40
			24 hours	80
4	Carbon Monoxide (CO), mg/m^3		8 Hours	2.0
5	Sulphur Dioxide (SO_2), $\mu g/m^3$	IS:5182 Part-II/ CPCB	Annual	50
			24 hours	80

For Envision Enviro Technologies North East, Guwahati

Khairul Islam Sheikh
(Environmental Chemist)

Utpal Bezbaruah
(Technical Manager)
Authorized Signatory /Reviewed by

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.

---------- END OF REPORT----------

House No. 6, 1st Floor, Sankardev Path, Pub-Sarania, Chandmari, Guwahati-781003, Assam.
Mobile : +91 98592 32126 / 86110 96201 ♦ e-mail : envisionghy@gmail.com

Air Quality Monitoring -CP-3

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TESTREPORT

AMBIENT AIR ANALYSIS REPORT
Rep.No. AAAR_1503163_01_276 **Date: 31/08/2023**
Sample ID: EETNE/AUG/11/23 **ULR NO.: TC766923000000056F**

Issued to : **M/s. Andritz Hydro Pvt. Ltd., LKHEP Project, village – Longku, Dist. Dima Hasao, Pin - 788931**

Sample Drawn By : **UTPAL BEZBARUAH**
Sampling Plan & Procedure : **EETNE/SOP/01**
Analysis Duration : **25/08/23 TO 29/08/23, 26/08/23 TO 30/08/23, 27/08/23 TO 31/08/23**
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_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	HC (mg/m^3)	CO (mg/m^3)	SO_2 ($\mu g/m^3$)
i)	25/08/23	Near Service Bay	Clear	38.9	23.4	13.9	BDL	BDL	9.8
ii)	26/08/23	Near valve house		39.7	28.6	14.6	BDL	BDL	9.8
iii)	27/08/23	Near project Camp		37.9	26.7	13.4	BDL	BDL	8.1

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

Sl. No.	Pollutant	Test Method	Time Weighted Average	Concentration in Ambient Air: Industrial, Residential, Rural and Other Area
1	Particulate Matter (PM_{10}), $\mu g/m^3$	IS:5182 Part-XXIII/ CPCB	Annual	60
			24 hours	100
2	Particulate Matter ($PM_{2.5}$), $\mu g/m^3$	EETNE/SOP/01/2017	Annual	40
			24 hours	60
3	Nitrogen Dioxide (NO_2), $\mu g/m^3$	IS:5182 Part-VI/ CPCB	Annual	40
			24 hours	80
4	Carbon Monoxide (CO), mg/m^3		8 Hours	2.0
5	Sulphur Dioxide (SO_2), $\mu g/m^3$	IS:5182 Part-II/ CPCB	Annual	50
			24 hours	80

For Envision Enviro Technologies North East, Guwahati

Khairul Islam Sheikh
(Environmental Chemist)

Utpal Bezbaruah
(Technical Manager)
Authorized Signatory /Reviewed by

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.

Page **1** of **1**

House No. 6, 1st Floor, Sankardev Path, Pub-Sarania, Chariaman, Guwahati-781003, Assam.
Phone : +91 98640 10097 / 70038 10116 ◆ e-mail : envisionghy@gmail.com

Air Quality Monitoring -CP-4

ABNS SCIENTIFIC SERVICES

এবিএনএচ চাইন্টিফিক চার্ভিচেচ

এবীএনএস সাইंटीफीक सर्वीसेज

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৭, গুৱাহাটী ৭৮১০৩৩, অসম

TC-10736

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC10736230000000714F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED

2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,

LALGANESH GUWAHATI, KAMPUP(M),

GUWAHATI-781034. ASSAM

Sample Description: **AMBIENT AIR**
Sampling Location: Near 37/1
Location category: Rural

Analysis Start Date: 26/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Location		Near 37/1			latitude	longitude
					25.848898°N	92.946102°E
Date of sampling		23/12/2023			Weather	Clear
Sl No	**Parameters**	**Unit**	**RESULT**	**LIMIT**	**TEST METHOD**	
1.	Particulate Matter (<10um)	µg/m³	**91.0**	100	IS 5182: Part 23:2006 (Reaff. 2012)	
2.	Particulate Matter (<2.5um)	µg/m³	**53.0**	60	Lab SOP.Doc.NO. TPM/ABNS/E/5/D	
3.	Sulphur Dioxide (SO_2)	µg/m³	**10.28**	80	IS 5182 : Part 2 :2001 (Reaff.2012)	
4.	Oxides of Nitrogen (NO_x)	µg/m³	**24.9**	80	IS 5182 : Part 6 :2006 (Reaff.2012)	
5.	Ozone (O_3)	µg/m³	**36.0**	180	IS 5182 : Part 9 :1974 (Reaff.2019)	
6.	Ammonia (NH_3)	µg/m³	**35.0**	400	IS 5182 : Part 25 :2018	

Note: *The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

ABNS SCIENTIFIC SERVICES

এবিএনএচ চাইন্টিফিক চার্ভিচেচ

এবীएनएस साइंटीफीक सर्वीसेज

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

केतेकी पथ, रैडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/17 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED

2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,

LALGANESH GUWAHATI, KAMPUP(M),

GUWAHATI-781034. ASSAM

Sample Description: **AMBIENT AIR**
Sampling Location: Near 37/1
Location category: Rural

Date of sampling: 23/12/2023
Analysis Start Date: 26/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl No	Parameters	Unit	RESULT	LIMIT	TEST METHOD
7.	Carbon Monoxide (CO)	mg/m^3	**0.25**	2	IS 5182 : Part 10 :1999 (Reaff.2014) (NDIR)
8.	Lead (Pb)	$\mu g/m^3$	**BDL**	1	IS 5182 : Part 22 :2004 (Reaff.2019)
9.	Nickel (Ni)	ng/m^3	**2.76**	20	USEPA-IO3.4
10.	Arsenic (As)	ng/m^3	**0.27**	6	USEPA-IO3.4
11.	Benzene (C_6H_6)	$\mu g/m^3$	**BDL**	5	IS:5182(Part-11):2006 Reaff : 2012
12.	Benzo(a)Pyrene (BaP)	ng/m^3	**BDL**	1	IS:5182(Part-12):2004 Reaff.: 2014

Note: *The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

ABNS SCIENTIFIC SERVICES

এবিএনএচ চাইন্টিফিক চার্ভিচেচ

এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৭, গুৱাহাটী ৭৮১০৩৩, অসম

TC-10736

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC1073623000000715F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED

2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,

LALGANESH GUWAHATI, KAMPUP(M),

GUWAHATI-781034. ASSAM

Sample Description: **AMBIENT AIR**
Sampling Location: Near 58/0
Location category: Rural

Analysis Start Date: 26/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Location	Near 58/0	latitude	longitude
		25.750729°N	92.897825°E
Date of sampling	23/12/2023	Weather	Clear

Sl No	Parameters	Unit	RESULT	LIMIT	TEST METHOD
1.	Particulate Matter (<10um)	µg/m³	**95.0**	100	IS 5182: Part 23:2006 (Reaff. 2012)
2.	Particulate Matter (<2.5um)	µg/m³	**56.0**	60	Lab SOP.Doc.NO. TPM/ABNS/E/5/D
3.	Sulphur Dioxide (SO_2)	µg/m³	**8.59**	80	IS 5182 : Part 2 :2001 (Reaff.2012)
4.	Oxides of Nitrogen (NO_x)	µg/m³	**28.3**	80	IS 5182 : Part 6 :2006 (Reaff.2012)
5.	Ozone (O_3)	µg/m³	**42.0**	180	IS 5182 : Part 9 :1974 (Reaff.2019)
6.	Ammonia (NH_3)	µg/m³	**37.0**	400	IS 5182 : Part 25 :2018

***Note**: The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

31/12/2023

Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

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H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam
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Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/18 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **AMBIENT AIR**
Sampling Location: Near 58/0
Location category: Rural

Date of sampling: 23/12/2023
Analysis Start Date: 26/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl No	Parameters	Unit	RESULT	LIMIT	TEST METHOD
7.	Carbon Monoxide (CO)	mg/m^3	**0.29**	2	IS 5182 : Part 10 :1999 (Reaff.2014) (NDIR)
8.	Lead (Pb)	$\mu g/m^3$	**BDL**	1	IS 5182 : Part 22 :2004 (Reaff.2019)
9.	Nickel (Ni)	ng/m^3	**4.17**	20	USEPA-IO3.4
10.	Arsenic (As)	ng/m^3	**0.38**	6	USEPA-IO3.4
11.	Benzene (C_6H_6)	$\mu g/m^3$	**BDL**	5	IS:5182(Part-11):2006 Reaff : 2012
12.	Benzo(a)Pyrene (BaP)	ng/m^3	**BDL**	1	IS:5182(Part-12):2004 Reaff,: 2014

***Note**: The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services * ABNS * Guwahati, Assam

31/12/2023
Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

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TC-10736
Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC1073623000000716F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **AMBIENT AIR**
Sampling Location: Near 87/0
Location category: Rural

Analysis Start Date: 26/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Location		Near 87/0			latitude	longitude
					25.696654°N	92.806566°E
Date of sampling		23/12/2023			Weather	Clear
Sl No	**Parameters**	**Unit**	**RESULT**	**LIMIT**	**TEST METHOD**	
1.	Particulate Matter (<10um)	µg/m³	**86.0**	100	IS 5182: Part 23:2006 (Reaff. 2012)	
2.	Particulate Matter (<2.5um)	µg/m³	**54.0**	60	Lab SOP.Doc.NO. TPM/ABNS/E/5/D	
3.	Sulphur Dioxide (SO_2)	µg/m³	**9.16**	80	IS 5182 : Part 2 :2001 (Reaff.2012)	
4.	Oxides of Nitrogen (NO_x)	µg/m³	**27.5**	80	IS 5182 : Part 6 :2006 (Reaff.2012)	
5.	Ozone (O_3)	µg/m³	**39.0**	180	IS 5182 : Part 9 :1974 (Reaff.2019)	
6.	Ammonia (NH_3)	µg/m³	**51.0**	400	IS 5182 : Part 25 :2018	

***Note**: The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

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H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam
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Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/19 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **AMBIENT AIR**
Sampling Location: Near 87/0
Location category: Rural

Date of sampling: 23/12/2023
Analysis Start Date: 26/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl No	Parameters	Unit	RESULT	LIMIT	TEST METHOD
7.	Carbon Monoxide (CO)	mg/m^3	**0.22**	2	IS 5182 : Part 10 :1999 (Reaff.2014) (NDIR)
8.	Lead (Pb)	$\mu g/m^3$	**BDL**	1	IS 5182 : Part 22 :2004 (Reaff.2019)
9.	Nickel (Ni)	ng/m^3	**3.61**	20	USEPA-IO3.4
10.	Arsenic (As)	ng/m^3	**0.23**	6	USEPA-IO3.4
11.	Benzene (C_6H_6)	$\mu g/m^3$	**BDL**	5	IS:5182(Part-11):2006 Reaff : 2012
12.	Benzo(a)Pyrene (BaP)	ng/m^3	**BDL**	1	IS:5182(Part-12):2004 Reaff.: 2014

Note: *The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services * ABNS * Guwahati, Assam

31/12/2023

Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

ABNS SCIENTIFIC SERVICES

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এবীএনএস সাइंटीफीक सर्वीसेज

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

केतेकी पथ, रैडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम

TC-10736

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC10736230000000717F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED

2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,

LALGANESH GUWAHATI, KAMPUP(M),

GUWAHATI-781034. ASSAM

Sample Description: **AMBIENT AIR** Analysis Start Date: 26/12/2023

Sampling Location: Near AP 1/0 Analysis End Date: 30/12/2023

Location category: Rural

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Location		Near AP 1/0			latitude	longitude
					25.696654°N	92.806566°E
Date of sampling		23/12/2023			Weather	Clear
Sl No	**Parameters**	**Unit**	**RESULT**	**LIMIT**	**TEST METHOD**	
1.	Particulate Matter (<10um)	µg/m³	**92.0**	100	IS 5182: Part 23:2006 (Reaff. 2012)	
2.	Particulate Matter (<2.5um)	µg/m³	**48.0**	60	Lab SOP.Doc.NO. TPM/ABNS/E/5/D	
3.	Sulphur Dioxide (SO_2)	µg/m³	**7.96**	80	IS 5182 : Part 2 :2001 (Reaff.2012)	
4.	Oxides of Nitrogen (NO_x)	µg/m³	**28.3**	80	IS 5182 : Part 6 :2006 (Reaff.2012)	
5.	Ozone (O_3)	µg/m³	**38.0**	180	IS 5182 : Part 9 :1974 (Reaff.2019)	
6.	Ammonia (NH_3)	µg/m³	**46.0**	400	IS 5182 : Part 25 :2018	

Note: *The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah ('TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

Authorized Signatory

(Dr. Mayur Jyoti Mahanta)

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Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/20 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **AMBIENT AIR**
Sampling Location: Near AP 1/0
Location category: Rural

Date of sampling: 23/12/2023
Analysis Start Date: 26/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl No	Parameters	Unit	RESULT	LIMIT	TEST METHOD
7.	Carbon Monoxide (CO)	mg/m^3	**0.30**	2	IS 5182 : Part 10 :1999 (Reaff.2014) (NDIR)
8.	Lead (Pb)	$\mu g/m^3$	**BDL**	1	IS 5182 : Part 22 :2004 (Reaff.2019)
9.	Nickel (Ni)	ng/m^3	**5.07**	20	USEPA-IO3.4
10.	Arsenic (As)	ng/m^3	**0.41**	6	USEPA-IO3.4
11.	Benzene (C_6H_6)	$\mu g/m^3$	**BDL**	5	IS:5182(Part-11):2006 Reaff : 2012
12.	Benzo(a)Pyrene (BaP)	ng/m^3	**BDL**	1	IS:5182(Part-12):2004 Reaff,: 2014

Note: *The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023
Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

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H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam
केतेकी पथ, रेडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम
TC-10736
Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC1073623000000713F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED

2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,

LALGANESH GUWAHATI, KAMPUP(M),

GUWAHATI-781034. ASSAM

Sample Description: **AMBIENT AIR**
Sampling Location: Lalungdubi Gaon
Location category: Rural

Analysis Start Date: 26/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Location		Near Lalungdubi Gaon			latitude	longitude
					25.90285°N	92.942726°E
Date of sampling		23/12/2023			Weather	Clear
Sl No	**Parameters**	**Unit**	**RESULT**	**LIMIT**	**TEST METHOD**	
1.	Particulate Matter (<10um)	µg/m³	**83.0**	100	IS 5182: Part 23:2006 (Reaff. 2012)	
2.	Particulate Matter (<2.5um)	µg/m³	**50.0**	60	Lab SOP.Doc.NO. TPM/ABNS/E/5/D	
3.	Sulphur Dioxide (SO_2)	µg/m³	**7.3**	80	IS 5182 : Part 2 :2001 (Reaff.2012)	
4.	Oxides of Nitrogen (NO_x)	µg/m³	**21.9**	80	IS 5182 : Part 6 :2006 (Reaff.2012)	
5.	Ozone (O_3)	µg/m³	**42.0**	180	IS 5182 : Part 9 :1974 (Reaff.2019)	
6.	Ammonia (NH_3)	µg/m³	**32.0**	400	IS 5182 : Part 25 :2018	

***Note**: The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services * ABNS * Guwahati, Assam

31/12/2023
Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

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H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam
কেতেকী পথ, রেডিসন ব্লু কে পাস, এন এইচ ২৭, গুৱাহাটী ৭৮১০৩৩, অসম
Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/16 | **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **AMBIENT AIR**
Sampling Location: Lalungdubi Gaon
Location category: Rural

Date of sampling: 23/12/2023
Analysis Start Date: 26/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl No	Parameters	Unit	RESULT	LIMIT	TEST METHOD
7.	Carbon Monoxide (CO)	mg/m^3	**0.19**	2	IS 5182 : Part 10 :1999 (Reaff.2014) (NDIR)
8.	Lead (Pb)	$\mu g/m^3$	**BDL**	1	IS 5182 : Part 22 :2004 (Reaff.2019)
9.	Nickel (Ni)	ng/m^3	**2.02**	20	USEPA-IO3.4
10.	Arsenic (As)	ng/m^3	**0.31**	6	USEPA-IO3.4
11.	Benzene (C_6H_6)	$\mu g/m^3$	**BDL**	5	IS:5182(Part-11):2006 Reaff : 2012
12.	Benzo(a)Pyrene (BaP)	ng/m^3	**BDL**	1	IS:5182(Part-12):2004 Reaff,: 2014

Note: *The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services * ABNS * Guwahati, Assam

31/12/2023
Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

Annexure 14 Surface water Monitoring Results

Surface water Monitoring results CP-2

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Enviro Technologies North East

TC-7669

RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

TEST REPORT:
Report No: 231211_1503163_01
ULR No: TC766923000000169P
Sample ID No: EETNE/DEC/01/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	**M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.**					
Sample Description	**Type: Surface Water (Dam Site)**				**Source: Kopili River**	
Sample collected by	**M/s. En-vision Enviro Technologies North East**					
Sample Collection Particulars	**Date 29/11/2023**	**Time 12:15 P.M**	**Temperature 28°C**	**pH 7.3**	**Quantity Drawn:2L**	**Sampling Method: EETNE/SOP/02**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
1	pH	---	6.92	APHA 23rd Edition 2017,4500-H+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	6.5-8.5
2	Turbidity	NTU	2.8	IS 3025 (Part 4)	5
3	TDS	mg/L	114	IS 3025 (Part 16)	2000
4	TSS	mg/L	83.6	IS 3025 (Part 18)	---
5	Oil and Grease	mg/L	<5	APHA 23rd Edition 2017,5520 B, Page:5-42	---
6	Dissolved Oxygen	mg/L	5.3	APHA 23rd Edition 2017,4500-O C,Page:4-146	---
7	Total hardness	mg/L	85.1	IS 3025 (Part 21)	600
8	Calcium	mg/L	36.8	IS 3025 (Part 40)	200
9	Magnesium	mg/L	19.4	IS 3025 (Part 46)	100
10	Total Alkalinity	mg/L	27.6	IS 3025 (Part 23)	600
11	Sulphate	mg/L	10.4	APHA 23rd Edition 2017,4500-SO_4^{2-} E,Page:4-199	400
12	Nitrates	mg/L	7.3	APHA 23rd Edition 2017,4500-NO_3^- B,Page:4-127	---
13	Phosphate	mg/L	<0.02	APHA 23rd Edition 2017, 4500-P D, Page no:4-163	---

Page 1 of 2

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TC-7669

RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

Sample ID No: EETNE/DEC/01/23
Test Starting Date: 04/12/2023

Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
14	Salinity	%	0.3	APHA 23rd Edition 2017, 2520B, Page: 2-60	-----
15	Conductivity	µS/cm	106.5	APHA 23rd Edition 2017, 2510B, Page: 2-58	2500
16	Arsenic	mg/L	BDL	APHA 23rd Edition 2017, 3114B, Page:3-36	0.05
17	Iron(as Fe)	mg/L	0.32	APHA 23rd Edition 2017,3500-Fe B,Page:3-80	-----
18	Total Coliform	MPN/100	2	APHA 23rd Edition 2017, 9222B, Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition 2017, 9222 D, Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	5.3	APHA 23rd Edition 2017,5210 B,Page:5-6/ IS 3025 (Part 44)	----
21	COD	mg/L	24	APHA 23rd Edition 2017, 5220-B, Page No: 5-18	-----

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

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 19 are analyzed by Department of Chemistry,B.Boroooah College as per our MOU.

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TC - 7669

TEST REPORT:
Report No: 231211_1503163_02
ULR No: TC766923000000170P
Sample ID No: EETNE/DEC/02/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.					
Sample Description	Type: Surface Water (1 km U/S of dam site)				Source: Kopili River	
Sample collected by	M/s. En-vision Enviro Technologies North East					
Sample Collection Particulars	Date 29/11/2023	Time 10:15 A.M	Temperature 28°C	pH 7.1	Quantity Drawn:2L	Sampling Method: EETNE/SOP/02

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
1	pH	—	6.95	APHA 23rd Edition 2017,4500-H^+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	6.5-8.5
2	Turbidity	NTU	1.5	IS 3025 (Part 4)	5
3	TDS	mg/L	76.8	IS 3025 (Part 16)	2000
4	TSS	mg/L	48.3	IS 3025 (Part 18)	----
5	Oil and Grease	mg/L	<5	APHA 23rd Edition 2017,5520 B, Page:5-42	----
6	Dissolved Oxygen	mg/L	5.8	APHA 23rd Edition 2017,4500-O C,Page:4-146	----
7	Total hardness	mg/L	60	IS 3025 (Part 21)	600
8	Calcium	mg/L	24.7	IS 3025 (Part 40)	200
9	Magnesium	mg/L	13.5	IS 3025 (Part 46)	100
10	Total Alkalinity	mg/L	36	IS 3025 (Part 23)	600
11	Sulphate	mg/L	27.2	APHA 23rd Edition 2017,4500-SO_4^{2-} E,Page:4-199	400
12	Nitrates	mg/L	8.5	APHA 23rd Edition 2017,4500-NO_3 B,Page:4-127	-----
13	Phosphate	mg/L	<0.02	APHA 23rd Edition 2017, 4500-P D, Page no:4-163	-----

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RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

TC - 7869

Sample ID No: EETNE/DEC/02/23 **Date of sample receipt: 04/12/2023**
Test Starting Date: 04/12/2023 **Test completion Date: 11/12/23**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
14	Salinity	%	0.2	APHA 23rd Edition 2017, 2520B, Page: 2-60	-----
15	Conductivity	µS/cm	89.4	APHA 23rd Edition 2017, 2510B, Page:2-58	2500
16	Arsenic	mg/L	BDL	APHA 23rd Edition 2017, 3114B, Page:3-36	0.05
17	Iron(as Fe)	mg/L	0.67	APHA 23rd Edition 2017,3500-Fe B,Page:3-80	-----
18	Total Coliform	MPN/100	2	APHA 23rd Edition 2017, 9222B, Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition 2017, 9222 D, Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	3.9	APHA 23rd Edition 2017,5210 B,Page:5-6/ IS 3025 (Part 44)	----
21	COD	mg/L	21	APHA 23rd Edition 2017, 5220-B, Page No: 5-18	-----

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

Note: i) The results relate only to the parameters tested.
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TC - 7669

TEST REPORT:
Report No: 231211_1503163_03
ULR No: TC766923000000171P
Sample ID No: EETNE/DEC/03/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	**M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.**					
Sample Description	**Type: Surface Water (1 km D/S of dam site)**				**Source: Kopili River**	
Sample collected by	**M/s. En-vision Enviro Technologies North East**					
Sample Collection Particulars	**Date 29/11/2023**	**Time 10:45 A.M**	**Temperature 28°C**	**pH 7.1**	**Quantity Drawn:2L**	**Sampling Method: EETNE/SOP/02**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
1	pH	---	6.91	APHA 23rd Edition 2017,4500-H+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	6.5-8.5
2	Turbidity	NTU	2.8	IS 3025 (Part 4)	5
3	TDS	mg/L	82.7	IS 3025 (Part 16)	2000
4	TSS	mg/L	95.4	IS 3025 (Part 18)	----
5	Oil and Grease	mg/L	<5	APHA 23rd Edition 2017,5520 B, Page:5-42	----
6	Dissolved Oxygen	mg/L	5.9	APHA 23rd Edition 2017,4500-O C,Page:4-146	----
7	Total hardness	mg/L	86.3	IS 3025 (Part 21)	600
8	Calcium	mg/L	29.6	IS 3025 (Part 40)	200
9	Magnesium	mg/L	18.1	IS 3025 (Part 46)	100
10	Total Alkalinity	mg/L	58.5	IS 3025 (Part 23)	600
11	Sulphate	mg/L	28.2	APHA 23rd Edition 2017,4500-SO_4^{2-} E,Page:4-199	400
12	Nitrates	mg/L	4.1	APHA 23rd Edition 2017,4500-NO_3^- B,Page:4-127	-----
13	Phosphate	mg/L	<0.02	APHA 23rd Edition 2017, 4500-P D, Page no:4-163	-----

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Sample ID No: EETNE/DEC/03/23
Test Starting Date: 04/12/2023

Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
14	Salinity	%	0.3	APHA 23rd Edition 2017, 2520B, Page: 2-60	----
15	Conductivity	µS/cm	102.7	APHA 23rd Edition 2017, 2510B, Page:2-58	2500
16	Arsenic	mg/L	BDL	APHA 23rd Edition 2017, 3114B, Page:3-36	0.05
17	Iron(as Fe)	mg/L	0.63	APHA 23rd Edition 2017,3500-Fe B,Page:3-80	----
18	Total Coliform	MPN/100	2	APHA 23rd Edition 2017, 9222B, Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition 2017, 9222 D, Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	4.8	APHA 23rd Edition 2017,5210 B,Page:5-6/ IS 3025 (Part 44)	----
21	COD	mg/L	27	APHA 23rd Edition 2017, 5220-B, Page No: 5-18	----

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

Note: i) The results relate only to the parameters tested.
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TEST REPORT:
Report No: 231211_1503163_04
ULR No: TC766923000000172P
Sample ID No: EETNE/DEC/04/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	**M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.**					
Sample Description	**Type: Surface Water (3 km D/S of dam site)**				**Source: Kopili River**	
Sample collected by	**M/s. En-vision Enviro Technologies North East**					
Sample Collection Particulars	**Date 29/11/2023**	**Time 11:05 A.M**	**Temperature 28°C**	**pH 6.9**	**Quantity Drawn:2L**	**Sampling Method: EETNE/SOP/02**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
1	pH	---	6.73	APHA 23rd edition 2017,4500-H+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	6.5-8.5
2	Turbidity	NTU	2.1	IS 3025 (Part 4)	5
3	TDS	mg/L	36.4	IS 3025 (Part 16)	2000
4	TSS	mg/L	88.5	IS 3025 (Part 18)	---
5	Oil and Grease	mg/L	<5	APHA 23rd Edition 2017,5520 B, Page:5-42	---
6	Dissolved Oxygen	mg/L	6.9	APHA 23rd Edition 2017,4500-O C,Page:4-146	---
7	Total hardness	mg/L	58	IS 3025 (Part 21)	600
8	Calcium	mg/L	18.4	IS 3025 (Part 40)	200
9	Magnesium	mg/L	8.7	IS 3025 (Part 46)	100
10	Total Alkalinity	mg/L	36.1	IS 3025 (Part 23)	600
11	Sulphate	mg/L	27.5	APHA 23rd Edition 2017,4500-SO_4^{2-} E,Page:4-199	400
12	Nitrates	mg/L	6.3	APHA 23rd Edition 2017,4500-NO_3 B,Page:4-127	---
13	Phosphate	mg/L	<0.02	APHA 23rd Edition 2017, 4500-P E, Page no:4-163	---

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Sample ID No: EETNE/DEC/04/23 **Date of sample receipt: 04/12/2023**
Test Starting Date: 04/12/2023 **Test completion Date: 11/12/23**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
14	Salinity	%	0.3	APHA 23rd Edition 2017, 2520B, Page: 2-60	-----
15	Conductivity	µS/cm	92.6	APHA 23rd Edition 2017, 2510B, Page:2-58	2500
16	Arsenic	mg/L	BDL	APHA 23rd Edition 2017, 3114B, Page:3-36	0.05 *
17	Iron(as Fe)	mg/L	0.54	APHA 23rd Edition 2017,3500-Fe B,Page:3-80	-----
18	Total Coliform	MPN/100	2	APHA 23rd Edition 2017, 9222B, Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition 2017, 9222 D, Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	5.7	APHA 23rd Edition 2017,5210 B,Page:5-6/ IS 3025 (Part 44)	----
21	COD	mg/L	26	APHA 23rd Edition 2017, 5220-B, Page No: 5-18	-----

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

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RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

TEST REPORT:
Report No: 231211_1503163_05
ULR No: TC766923000000173P
Sample ID No: EETNE/DEC/05/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	**M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.**					
Sample Description	**Type: Surface Water (8 km D/S of dam site)**				**Source: Kopili River**	
Sample collected by	**M/s. En-vision Enviro Technologies North East**					
Sample Collection Particulars	**Date 29/11/2023**	**Time 11:25 A.M**	**Temperature 28°C**	**pH 7.2**	**Quantity Drawn:2L**	**Sampling Method: EETNE/SOP/02**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
1	pH	---	6.73	APHA 23rd Edition 2017,4500-H+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	6.5-8.5
2	Turbidity	NTU	2.5	IS 3025 (Part 4)	5
3	TDS	mg/L	21.6	IS 3025 (Part 16)	2000
4	TSS	mg/L	56.4	IS 3025 (Part 18)	----
5	Oil and Grease	mg/L	<5	APHA 23rd Edition 2017,5520 B, Page:5-42	----
6	Dissolved Oxygen	mg/L	7.1	APHA 23rd Edition 2017,4500-O C,Page:4-146	----
7	Total hardness	mg/L	62.6	IS 3025 (Part 21)	600
8	Calcium	mg/L	32.5	IS 3025 (Part 40)	200
9	Magnesium	mg/L	16.8	IS 3025 (Part 46)	100
10	Total Alkalinity	mg/L	106.9	IS 3025 (Part 23)	600
11	Sulphate	mg/L	21.2	APHA 23rd Edition 2017,4500-SO_4^{2-} E,Page:4-199	400
12	Nitrates	mg/L	5.3	APHA 23rd Edition 2017,4500-NO_3^- B,Page:4-127	----
13	Phosphate	mg/L	<0.02	APHA 23rd Edition 2017, 4500-P D, Page no:4-163	----

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Sample ID No: EETNE/DEC/05/23 **Date of sample receipt: 04/12/2023**
Test Starting Date: 04/12/2023 **Test completion Date: 11/12/23**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
14	Salinity	%	0.3	APHA 23rd Edition 2017, 2520B, Page: 2-60	-----
15	Conductivity	µS/cm	118.2	APHA 23rd Edition 2017, 2510B, Page:2-58	2500
16	Arsenic	mg/L	BDL	APHA 23rd Edition 2017, 3114B, Page:3-36	0.05
17	Iron(as Fe)	mg/L	0.835	APHA 23rd Edition 2017,3500-Fe B,Page:3-80	-----
18	Total Coliform	MPN/100	2	APHA 23rd Edition 2017, 9222B, Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition 2017, 9222 D, Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	4.5	APHA 23rd Edition 2017,5210 B,Page:5-6/ IS 3025 (Part 44)	-----
21	COD	mg/L	20.6	APHA 23rd Edition 2017, 5220-B, Page No: 5-18	-----

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

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Enviro Technologies North East

TC-7669

RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

TEST REPORT:
Report No: 231211_1503163_12
ULR No: TC766923000000180P
Sample ID No: EETNE/DEC/12/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	**M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.**					
Sample Description	**Type: Surface Water**				**Source: Adit Pond**	
Sample collected by	**M/s. En-vision Enviro Technologies North East**					
Sample Collection Particulars	**Date 01/12/2023**	**Time 10:30 A.M**	**Temperature 28°C**	**pH 8.4**	**Quantity Drawn:2L**	**Sampling Method: EETNE/SOP/02**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
1	pH	---	8.33	APHA 23rd Edition 2017,4500-H+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	6.5-8.5
2	Turbidity	NTU	1.2	IS 3025 (Part 4)	5
3	TDS	mg/L	96.1	IS 3025 (Part 16)	2000
4	TSS	mg/L	51.7	IS 3025 (Part 18)	----
5	Oil and Grease	mg/L	<5	APHA 23rd Edition 2017,5520 B, Page:5-42	----
6	Dissolved Oxygen	mg/L	6.9	APHA 23rd Edition 2017,4500-O C,Page:4-146	----
7	Total hardness	mg/L	92.4	IS 3025 (Part 21)	600
8	Calcium	mg/L	30.5	IS 3025 (Part 40)	200
9	Magnesium	mg/L	14.7	IS 3025 (Part 46)	100
10	Total Alkalinity	mg/L	60.8	IS 3025 (Part 23)	600
11	Sulphate	mg/L	20.6	APHA 23rd Edition 2017,4500-SO_4^{2-} E,Page:4-199	400
12	Nitrates	mg/L	3.7	APHA 23rd Edition 2017,4500-NO_3^- B,Page:4-127	----
13	Phosphate	mg/L	<0.02	APHA 23rd Edition 2017, 4500-P D, Page no:4-163	----

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Enviro Technologies North East

TC-7669

RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

Sample ID No: EETNE/DEC/12/23
Test Starting Date: 04/12/2023

Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
14	Salinity	%	0.2	APHA 23rd Edition 2017, 2520B, Page: 2-60	----
15	Conductivity	µS/cm	150	APHA 23rd Edition 2017, 2510B, Page:2-58	2500
16	Arsenic	mg/L	BDL	APHA 23rd Edition 2017, 3114B, Page:3-36	0.05
17	Iron(as Fe)	mg/L	0.211	APHA 23rd Edition 2017,3500-Fe B,Page:3-80	----
18	Total Coliform	MPN/100	1	APHA 23rd Edition 2017, 9222B, Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition 2017, 9222 D, Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	2.1	APHA 23rd Edition 2017,5210 B,Page:5-6/ IS 3025 (Part 44)	----
21	COD	mg/L	8.5	APHA 23rd Edition 2017, 5220-B, Page No. 5-18	----

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

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

Page 2 of 2

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TC-7669

RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

TEST REPORT:
Report No: 231211_1503163_09
ULR No: TC766923000000177P
Sample ID No: EETNE/DEC/09/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	**M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.**					
Sample Description	**Type: Surface Water**			**Source: Power house Service Bay**		
Sample collected by	**M/s. En-vision Enviro Technologies North East**					
Sample Collection Particulars	**Date 30/11/2023**	**Time 11:45 A.M**	**Temperature 28°C**	**pH 6.6**	**Quantity Drawn:2L**	**Sampling Method. EETNE/SOP/02**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
1	pH	---	6.58	APHA 23rd Edition 2017,4500-H+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	6.5-8.5
2	Turbidity	NTU	2.8	IS 3025 (Part 4)	5
3	TDS	mg/L	87.2	IS 3025 (Part 16)	2000
4	TSS	mg/L	63.1	IS 3025 (Part 18)	---
5	Oil and Grease	mg/L	<5	APHA 23rd Edition 2017,5520 B, Page:5-42	---
6	Dissolved Oxygen	mg/L	7.3	APHA 23rd Edition 2017,4500-O C,Page:4-146	---
7	Total hardness	mg/L	80	IS 3025 (Part 21)	600
8	Calcium	mg/L	28.2	IS 3025 (Part 40)	200
9	Magnesium	mg/L	17.7	IS 3025 (Part 46)	100
10	Total Alkalinity	mg/L	5	IS 3025 (Part 23)	600
11	Sulphate	mg/L	24.6	APHA 23rd Edition 2017,4500-SO_4^{2-} E,Page:4-199	400
12	Nitrates	mg/L	4.5	APHA 23rd Edition 2017,4500-NO_3^- B,Page:4-127	---
13	Phosphate	mg/L	<0.02	APHA 23rd Edition 2017, 4500-P D, Page no:4-163	---

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TC-7669

RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

Sample ID No: EETNE/DEC/09/23 **Date of sample receipt: 04/12/2023**
Test Starting Date: 04/12/2023 **Test completion Date: 11/12/23**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
14	Salinity	%	0.2	APHA 23rd Edition 2017, 2520B, Page: 2-60	----
15	Conductivity	µS/cm	135	APHA 23rd Edition 2017, 2510B, Page:2-58	2500
16	Arsenic	mg/L	BDL	APHA 23rd Edition 2017, 3114B, Page:3-36	0.05
17	Iron(as Fe)	mg/L	0.429	APHA 23rd Edition 2017,3500-Fe B,Page:3-80	----
18	Total Coliform	MPN/100	2	APHA 23rd Edition 2017, 9222B, Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition 2017, 9222 D, Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	6.1	APHA 23rd Edition 2017,5210 B,Page:5-6/ IS 3025 (Part 44)	----
21	COD	mg/L	25.5	APHA 23rd Edition 2017, 5220-B, Page No: 5-18	----

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

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End of report

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Surface water quality CP-4

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TC-7669

TEST REPORT:
Report No: 230902_1503164_01
ULR No: TC766923000000116P
Sample ID No: EETNE/AUG/20/23
Test Starting Date: 26/08/2023

Date of Report: 02/09/23
Date of sample receipt: 26/08/2023
Test completion Date: 02/09/23

Name & Address of Client	M/s. ANDRITZ HYDRO PVT. LTD., LKHEP PrOJECT,, village- longku, Dist- Dima Hasao, Pin-788931					
Sample Description	Type: Surface Water (Service Bay)				Source: Kopili River	
Sample collected by	M/s. En-vision Enviro Technologies North East					
Sample Collection Particulars	Date 25/08/2023	Time 10:45 A.M	Temperature 30°C	pH 6.71	Quantity Drawn:2L	Sampling Method: EETNE/SOP/02

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
1	pH	—	6.42	APHA 23rd Edition,4500 H+,Page:4-95	6.5-8.5
2	Turbidity	NTU	1.48	APHA 23rd Edition,2130,Page:2-13	5
3	TDS	mg/L	18.9	APHA 23rd Edition,2540 C, Page :2-69	2000
4	TSS	mg/L	74.12	APHA 23rd Edition,2540,Page:2-70	----
5	Oil and Grease	mg/L	<5	APHA 23rd Edition,5520 B,Page:5-42	----
6	Dissolved Oxygen	mg/L	4.5	APHA 23rd Edition,4500-O C,Page:4-146	6
7	Total hardness	mg/L	53	APHA 23rd Edition,2340 B,Page:2-48	600
8	Calcium	mg/L	21.3	APHA 23rd Edition,3500-Ca B,Page:3-69	200
9	Magnesium	mg/L	14	APHA 23rd Edition,3500-Mg B,Page:3-86	100
10	Total Alkalinity	mg/L	23	APHA 23rd Edition,2320,Page:2-37	600
11	Sulphate	mg/L	22.6	APHA 23rd Edition,4500-SO_4^{2-}E,Page:4-199	400
12	Nitrates	mg/L	6.1	APHA 23rd Edition,4500-NO_3^-B,Page:4-127	----
13	Phosphate	mg/L	<0.02	APHA 23rd Edition,4500-P,Page:4-163	----
14	Salinity	%	0.2	APHA 23rd Edition,2520B,Page:2-60	----
15	Conductivity	µS/cm	86	APHA 23rd Edition,2520B,Page:2-60	2500

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Sample ID No: EETNE/AUG/20/23
Test Starting Date: 26/08/2023

Date of sample receipt: 19/07/2023
Test completion Date: 02/09/2023

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
16	Arsenic	mg/L	BDL	APHA 23rd Edition,3114A,Page:3-36	------ -----
17	Iron(as Fe)	mg/L	0.92	APHA 23rd Edition,3500-Fe B,Page:3-80	------ -----
18	Total Coliform	MPN/100	4	APHA 23rd Edition,9222B,Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition,9222 D,Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	5	APHA 23rd Edition,5210B,Page:5-6	------ -----
21	COD	mg/L	43	APHA 23rd Edition,5220 b,Page:5-18	------ -----

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory

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

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RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

TC-7669

TEST REPORT:
Report No: 230902_1503163_01
ULR No: TC766923000000117P
Sample ID No: EETNE/AUG/21/23
Test Starting Date: 26/08/2023

Date of Report: 02/09/23
Date of sample receipt: 26/08/2023
Test completion Date: 02/09/23

Name & Address of Client	M/s. ANDRITZ HYDRO PVT. LTD., LKHEP PROJECT,, village- longku, Dist- Dima Hasao, Pin-788931					
Sample Description	Type: Surface Water (Valve House)				Source: Kopili River	
Sample collected by	M/s. En-vision Enviro Technologies North East					
Sample Collection Particulars	Date 25/08/2023	Time 10:45 A.M	Temperature 30°C	pH 6.71	Quantity Drawn:2L	Sampling Method: EETNE/SOP/02

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
1	pH	—	6.62	APHA 23rd Edition,4500 H+,Page:4-95	6.5-8.5
2	Turbidity	NTU	1.26	APHA 23rd Edition,2130,Page:2-13	5
3	TDS	mg/L	203	APHA 23rd Edition,2540 C, Page :2-69	2000
4	TSS	mg/L	92.4	APHA 23rd Edition,2540,Page:2-70	----
5	Oil and Grease	mg/L	<5	APHA 23rd Edition,5520 B,Page:5-42	----
6	Dissolved Oxygen	mg/L	5.4	APHA 23rd Edition,4500-O C,Page:4-146	6
7	Total hardness	mg/L	53	APHA 23rd Edition,2340 B,Page:2-48	600
8	Calcium	mg/L	27.2	APHA 23rd Edition,3500-Ca B,Page:3-69	200
9	Magnesium	mg/L	16.5	APHA 23rd Edition,3500-Mg B,Page:3-86	100
10	Total Alkalinity	mg/L	162	APHA 23rd Edition,2320,Page:2-37	600
11	Sulphate	mg/L	11.6	APHA 23rd Edition,4500-SO_4^{2-}E,Page:4-199	400
12	Nitrates	mg/L	6.4	APHA 23rd Edition,4500-NO_3^-B,Page:4-127	----
13	Phosphate	mg/L	<0.02	APHA 23rd Edition,4500-P,Page:4-163	----
14	Salinity	%	0.3	APHA 23rd Edition,2520B,Page:2-60	----
15	Conductivity	µS/cm	220	APHA 23rd Edition,2520B,Page:2-60	2500

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TC-7669

Sample ID No: EETNE/AUG/21/23 **Date of sample receipt: 19/07/2023**
Test Starting Date: 26/08/2023 **Test completion Date: 02/09/2023**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
16	Arsenic	mg/L	<0.001	APHA 23rd Edition,3114A,Page:3-36	------
17	Iron(as Fe)	mg/L	0.94	APHA 23rd Edition,3500-Fe B,Page:3-80	------
18	Total Coliform	MPN/100	3	APHA 23rd Edition,9222B,Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition,9222 D,Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	9	APHA 23rd Edition,5210B,Page:5-6	------
21	COD	mg/L	24	APHA 23rd Edition,5220 b,Page:5-18	------

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory

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Surface water quality CP-4

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, রেডিসন ব্লু কে পাস, এন এইচ ২৭, গুবাহাটী ৩৮১০৩৩, অসম

TC-10736

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC1073623000000732F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Surface Water**
Sampling Location: **Near AP 1/0**
(Latitude: 25.98746N, Longitude: 92.92382E)
Source: Pond

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 31/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
1	pH	-	7.11	IS 3025 Part 11: 1983
2	Total Dissolve Solids	mg/l.	193	IS 3025 Part 16: 1984
3	Total Hardness	mg/L	54.0	IS 3025 Part 21: 2009
4	Calcium	mg/L	26.4	IS 3025 Part 40: 1991
5	Magnesium	mg/L	5.72	IS 3025 Part 46: 1994
6	Total Alkalinity	mg/L	68.0	IS 3025 Part 23: 1986
7	Chloride	mg/L	27.0	IS 3025 Part 32: 1986
8	DO	mg/L	5.8	IS 3025 Part 38: 1989
9	BOD	mg/L	2	IS 3025 Part 44: 1993
10	COD	mg/L	10	IS 3025 Part 58: 2006

For ABNS Scientific Services,

Report reviewed by: Dr. Mayur Jyoti Mahanta (QM)

Scientific Services ABNS Guwahati, Assam

31/12/2023
Authorized Signatory

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, রেডিসন ব্লু কে পাস, এন এইচ ২৭, গুবাহাটী ৬৮১০৩৩, অসম

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/44 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Surface Water**
Sampling Location: **Near AP 1/0**
(Latitude: 25.98746N, Longitude: 92.92382E)
Source: Pond

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 31/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
11	Colour	(Hazen)	7	APHA 23rd Edtn., 2120 B
12	Odour		Agreeable	APHA 23rd Edtn., 2150 B
13	Temperature	°C	17.3	APHA 23rd Edtn., 2550 B
14	Turbidity	NTU	4.19	APHA 22nd Edtn., 2012, 2130 B
15	Sulphate	mg/L	17.5	APHA 23rd Edn., 4500 SO4 E, 2017
16	Nitrate	mg/L	2.86	APHA 23rd Edtn., 4500 NO3 E, 2017
17	Flouride	mg/L	1.03	APHA 23rd Edtn., 4500 F C/D, 2017
18	Sodium	mg/L	47	IS 3025 (Part 45)
19	Potassium	mg/L	32	IS 3025 (Part 48) : 1994, Rffm. 2003
20	Iron	mg/L	0.15	APHA 23rd Edtn., 3500 Fe B, 2017
21	Copper	mg/L	<0.01	APHA 23rd Edtn., 3120 B, 2017 (ICPOES)
22	Total Phosphate	mg/L	0.29	APHA 23rd Edtn., 4500 P-B, D, 2017
23	Chromium (Cr)	mg/L	<0.02	APHA 23rd Edtn., 3111 D, 2017 (AAS FLAME)
24	Manganese (Mn)	mg/L	<0.02	APHA 23rd Edtn., 3120 B, 2017 (ICPOES)
25	Total coliform	MPN/100 ml	40	IS 1622-1981, Reff. 2014
26	Faecal coliforms	MPN/100 ml	Not Detected	IS 1622-1981, Reff. 2014

For ABNS Scientific Services,

Report reviewed by: Dr. Mayur Jyoti Mahanta (QM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

Authorized Signatory

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এবীএনএস साइंटीफीक सर्वीसेज

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

केतेकी पथ, रैडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम

TC-10736

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC10736230000000731F | **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Surface Water**
Sampling Location: **Near 87/0**
(Latitude: 25.697083N, Longitude: 92.807244E)
Source: Pond

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 31/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
1	pH	-	**7.13**	IS 3025 Part 11: 1983
2	Total Dissolve Solids	mg/L	**178**	IS 3025 Part 16: 1984
3	Total Hardness	mg/L	**62.0**	IS 3025 Part 21: 2009
4	Calcium	mg/L	**32.9**	IS 3025 Part 40: 1991
5	Magnesium	mg/L	**5.86**	IS 3025 Part 46: 1994
6	Total Alkalinity	mg/L	**36.0**	IS 3025 Part 23: 1986
7	Chloride	mg/L	**23.5**	IS 3025 Part 32: 1986
8	DO	mg/L	**5.6**	IS 3025 Part 38: 1989
9	BOD	mg/L	**3**	IS 3025 Part 44: 1993
10	COD	mg/L	**10**	IS 3025 Part 58: 2006

For ABNS Scientific Services,

Report reviewed by: Dr. Mayur Jyoti Mahanta (QM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

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ABNS SCIENTIFIC SERVICES

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এবীএনএস साइंटीफीक सर्वीसेज

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিছন ব্লু'ৰ পাছ, এন এইচ ২৭, গুৱাহাটী ৭৮১০৩৩, অসম

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/45 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Surface Water**
Sampling Location: **Near 87/0**
(Latitude: 25.697083N, Longitude: 92.807244E)
Source: Pond

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 31/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
11	Colour	(Hazen)	10	APHA 23rd Edtn., 2120 B
12	Odour		Agreeable	APHA 23rd Edtn., 2150 B
13	Temperature	°C	18.2	APHA 23rd Edtn., 2550 B
14	Turbidity	NTU	2.17	APHA 22nd Edtn., 2012, 2130 B
15	Sulphate	mg/L	21.0	APHA 23rd Edn., 4500 SO4 E, 2017
16	Nitrate	mg/L	2.03	APHA 23rd Edtn., 4500 NO3 E, 2017
17	Flouride	mg/L	0.91	APHA 23rd Edtn., 4500 F C/D, 2017
18	Sodium	mg/L	56	IS 3025 (Part 45)
19	Potassium	mg/L	34	IS 3025 (Part 48) : 1994, Rffm. 2003
20	Iron	mg/L	0.18	APHA 23rd Edtn., 3500 Fe B, 2017
21	Copper	mg/L	<0.01	APHA 23rd Edtn., 3120 B, 2017 (ICPOES)
22	Total Phosphate	mg/L	0.29	APHA 23rd Edtn., 4500 P-B, D, 2017
23	Chromium (Cr)	mg/L	<0.02	APHA 23rd Edtn., 3111 D, 2017 (AAS FLAME)
24	Manganese (Mn)	mg/L	<0.02	APHA 23rd Edtn., 3120 B, 2017 (ICPOES)
25	Total coliform	MPN/100 ml	50	IS 1622-1981, Reff. 2014
26	Faecal coliforms	MPN/100 ml	Not Detected	IS 1622-1981, Reff. 2014

For ABNS Scientific Services,

Report reviewed by: Dr. Mayur Jyoti Mahanta (QM)

Scientific Services ABNS

31/12/2023

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৭, গুৱাহাটী ৭৮১০৩৩, অসম

TC-10736

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC1073623000000730F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Surface Water**
Sampling Location: **Near 58/0**
(Latitude: 25.751127N, Longitude: 92.897617E)
Source: Pond

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 31/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
1	pH	-	**7.15**	IS 3025 Part 11: 1983
2	Total Dissolve Solids	mg/L	**289**	IS 3025 Part 16: 1984
3	Total Hardness	mg/L	**72.0**	IS 3025 Part 21: 2009
4	Calcium	mg/L	**27.52**	IS 3025 Part 40: 1991
5	Magnesium	mg/L	**6.84**	IS 3025 Part 46: 1994
6	Total Alkalinity	mg/L	**56.0**	IS 3025 Part 23: 1986
7	Chloride	mg/L	**22.0**	IS 3025 Part 32: 1986
8	DO	mg/L	**6.2**	IS 3025 Part 38: 1989
9	BOD	mg/L	**3**	IS 3025 Part 44: 1993
10	COD	mg/L	**13**	IS 3025 Part 58: 2006

For ABNS Scientific Services,

Report reviewed by: Dr. Mayur Jyoti Mahanta (QM)

ABNS Scientific Services Guwahati, Assam

31/12/2023

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এবীএনএস সাइंटीफीक सर्वीसेज

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

केतेकी पथ, रैडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 899

TEST REPORT

Report Number: ABNS/EM/123123/43 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Surface Water**
Sampling Location: **Near 58/0**
(Latitude: 25.751127N, Longitude: 92.897617E)
Source: Pond

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 31/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
11	Colour	(Hazen)	8	APHA 23rd Edtn., 2120 B
12	Odour		Agreeable	APHA 23rd Edtn., 2150 B
13	Temperature	°C	16.3	APHA 23rd Edtn., 2550 B
14	Turbidity	NTU	3.58	APHA 22nd Edtn., 2012, 2130 B
15	Sulphate	mg/L	25.0	APHA 23rd Edn., 4500 SO4 E, 2017
16	Nitrate	mg/L	2.71	APHA 23rd Edtn., 4500 NO3 E, 2017
17	Flouride	mg/L	1.06	APHA 23rd Edtn., 4500 F C/D, 2017
18	Sodium	mg/L	42	IS 3025 (Part 45)
19	Potassium	mg/L	29	IS 3025 (Part 48) : 1994, Rffm. 2003
20	Iron	mg/L	0.23	APHA 23rd Edtn., 3500 Fe B, 2017
21	Copper	mg/L	<0.01	APHA 23rd Edtn., 3120 B, 2017 (ICPOES)
22	Total Phosphate	mg/L	0.25	APHA 23rd Edtn., 4500 P-B, D, 2017
23	Chromium (Cr)	mg/L	<0.02	APHA 23rd Edtn., 3111 D, 2017 (AAS FLAME)
24	Manganese (Mn)	mg/L	<0.02	APHA 23rd Edtn., 3120 B, 2017 (ICPOES)
25	Total coliform	MPN/100 ml	61	IS 1622-1981, Reff. 2014
26	Faecal coliforms	MPN/100 ml	Not Detected	IS 1622-1981, Reff. 2014

For ABNS Scientific Services,

Report reviewed by: Dr. Mayur Jyoti Mahanta (QM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৭, গুৱাহাটী ৭৮১০৩৩, অসম

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TC-10736

TEST REPORT

ULR Number: TC10736230000000729F | **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Surface Water**
Sampling Location: **Near 37/1**
(Latitude: 25.854547N, Longitude: 92.920560E)
Source: Pond

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 31/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
1	pH	-	7.15	IS 3025 Part 11: 1983
2	Total Dissolve Solids	mg/L	289	IS 3025 Part 16: 1984
3	Total Hardness	mg/L	72.0	IS 3025 Part 21: 2009
4	Calcium	mg/L	27.52	IS 3025 Part 40: 1991
5	Magnesium	mg/L	6.84	IS 3025 Part 46: 1994
6	Total Alkalinity	mg/L	56.0	IS 3025 Part 23: 1986
7	Chloride	mg/L	22.0	IS 3025 Part 32: 1986
8	DO	mg/L	6.2	IS 3025 Part 38: 1989
9	BOD	mg/L	3	IS 3025 Part 44: 1993
10	COD	mg/L	13	IS 3025 Part 58: 2006

For ABNS Scientific Services,

Report reviewed by: Dr. Mayur Jyoti Mahanta (QM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

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এবীएनएस साइंटीफीक सर्वीसेज

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

केतेकी पथ, रेडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/42 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Surface Water**
Sampling Location: **Near 37/1**
(Latitude: 25.854547N, Longitude: 92.920560E)
Source: Pond

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 31/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
11	Colour	(Hazen)	10	APHA 23rd Edtn., 2120 B
12	Odour		Agreeable	APHA 23rd Edtn., 2150 B
13	Temperature	°C	18.5	APHA 23rd Edtn., 2550 B
14	Turbidity	NTU	2.76	APHA 22nd Edtn., 2012, 2130 B
15	Sulphate	mg/L	21.0	APHA 23rd Edn., 4500 SO4 E, 2017
16	Nitrate	mg/L	3.19	APHA 23rd Edtn., 4500 NO3 E, 2017
17	Flouride	mg/L	1.56	APHA 23rd Edtn., 4500 F C/D, 2017
18	Sodium	mg/L	52	IS 3025 (Part 45)
19	Potassium	mg/L	37	IS 3025 (Part 48) : 1994, Rffm. 2003
20	Iron	mg/L	0.19	APHA 23rd Edtn., 3500 Fe B, 2017
21	Copper	mg/L	<0.01	APHA 23rd Edtn., 3120 B, 2017 (ICPOES)
22	Total Phosphate	mg/L	0.31	APHA 23rd Edtn., 4500 P-E, D, 2017
23	Chromium (Cr)	mg/L	<0.02	APHA 23rd Edtn., 3111 D, 2017 (AAS FLAME)
24	Manganese (Mn)	mg/L	<0.02	APHA 23rd Edtn., 3120 B, 2017 (ICPOES)
25	Total coliform	MPN/100 ml	47	IS 1622-1981, Reff. 2014
26	Faecal coliforms	MPN/100 ml	Not Detected	IS 1622-1981, Reff. 2014

For ABNS Scientific Services,

Report reviewed by: Dr. Mayur Jyoti Mahanta (QM)

Scientific Services ABNS Guwahati, Assam

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, রেডিসন ব্লু কে পাস, এন এইচ ২৭, গুবাহাটী ৭৮১০৩৩, অসম

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TC-10736

TEST REPORT

ULR Number: TC1073623000000728F | **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Surface Water**
Sampling Location: **Lalungdubi Village**
(Latitude: 25.891583N, Longitude: 92.921053E)
Source: Pond

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 31/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
1	pH	-	7.37	IS 3025 Part 11: 1983
2	Total Dissolve Solids	mg/L	317	IS 3025 Part 16: 1984
3	Total Hardness	mg/L	56.0	IS 3025 Part 21: 2009
4	Calcium	mg/L	38.0	IS 3025 Part 40: 1991
5	Magnesium	mg/L	8.14	IS 3025 Part 46: 1994
6	Total Alkalinity	mg/L	96.0	IS 3025 Part 23: 1986
7	Chloride	mg/L	23.5	IS 3025 Part 32: 1986
8	DO	mg/L	6.8	IS 3025 Part 38: 1989
9	BOD	mg/L	2	IS 3025 Part 44: 1993
10	COD	mg/L	11	IS 3025 Part 58: 2006

For ABNS Scientific Services,

Report reviewed by: Dr. Mayur Jyoti Mahanta (QM)

Scientific Services ABNS Guwahati, Assam

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, রেডিসন ব্লু কে পাস, এন এইচ ২৭, গুবাহাটী ৩৮১০৩৩, অসম

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/41 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Surface Water**
Sampling Location: **Lalungdubi Village**
Source: Pond

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 31/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
11	Colour	(Hazen)	5	APHA 23rd Edtn., 2120 B
12	Odour		Agreeable	APHA 23rd Edtn., 2150 B
13	Temperature	°C	19.3	APHA 23rd Edtn., 2550 B
14	Turbidity	NTU	3.19	APHA 22nd Edtn., 2012, 2130 B
15	Sulphate	mg/L	23.0	APHA 23rd Edn., 4500 SO4 E, 2017
16	Nitrate	mg/L	1.93	APHA 23rd Edtn., 4500 NO3 E, 2017
17	Flouride	mg/L	0.98	APHA 23rd Edtn., 4500 F C/D, 2017
18	Sodium	mg/L	53	IS 3025 (Part 45)
19	Potassium	mg/L	41	IS 3025 (Part 48) : 1994, Rffm. 2003
20	Iron	mg/L	0.21	APHA 23rd Edtn., 3500 Fe B, 2017
21	Copper	mg/L	<0.01	APHA 23rd Edtn., 3120 B, 2017 (ICPOES)
22	Total Phosphate	mg/L	0.34	APHA 23rd Edtn., 4500 P-B, D, 2017
23	Chromium (Cr)	mg/L	<0.02	APHA 23rd Edtn., 3111 D, 2017 (AAS FLAME)
24	Manganese (Mn)	mg/L	<0.02	APHA 23rd Edtn., 3120 B, 2017 (ICPOES)
25	Total coliform	MPN/100 ml	51	IS 1622-1981, Reff. 2014
26	Faecal coliforms	MPN/100 ml	Not Detected	IS 1622-1981, Reff. 2014

For ABNS Scientific Services,

Report reviewed by: Dr. Mayur Jyoti Mahanta (QM)

Scientific Services * ABNS * Guwahati, Assam

31/12/2023

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Annexure 15 Ground Water Quality

Ground water quality CP-1

en-vision
Enviro Technologies North East
Technologies for better tomorrow

Recognized by Pollution Control Board, Assam

TC-7669

TEST REPORT:
Report No: 2305824_14080047_0
ULR No: TC766923000000109P
Sample ID No: EETNE/AUG/05/23
Test Starting Date: 24/08/23

Date of Report: 31/08/23
Date of sample receipt: 24/08/23
Test completion Date: 31/08/23

Name & Address of Client	M/s. BVG India Ltd, Midas Tower, 4th Floor, Rajiv Gandhi Infotech Park, Phase-1, Hinjwani.				
Sample Description	Type: Raw Water	Source : Borewell			
Sample collected by	M/s. En-vision Enviro Technologies North East				
Sample Collection Particulars	Date 24/08/2023	Time 11:20 A.M	Temperature 28°C	Quantity Drawn:4L	Sampling Method: EETNE/SOP/02

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500: 2012	
					Acceptable limit	Permissible limit
1	pH	—	7.45	APHA 23rd Edition,4500-H+,Page:4-95	6.5-8.5	No relaxation
2	Turbidity	NTU	1.16	APHA 23rd Edition,2130,Page:2-13	1.0	5.0
3	TDS	mg/L	172	APHA 23rd Edition,2540 C ,Page :2-69	500	2000
4	Total hardness	mg/L	63.2	APHA 23rd Edition,2340 B,Page:2-48	200	600
5	Calcium	mg/L	34.8	APHA 23rd Edition,3500-Ca B,Page:3-69	75	200
6	Magnesium	mg/L	14.5	APHA 23rd Edition,3500-Mg B,Page:3-86	30	100
7	Total Alkalinity	mg/L	114	APHA 23rd Edition,2320 B,Page:2-37	200	600

Page 1 of 2

House No. 6, 1st Floor, Sankardev Path, Pub-Sarania, Chandmari, Guwahati-781003, Assam.
Phone : +91 98640 10097 / 70028 10116 ♦ e-mail : envisionghy@gmail.com

en-vision
Envirn Technologies North East
Technologies for better tomorrow

Recognized by Pollution Control Board, Assam

TC-7669

Report No: 230831_14080047_0
Sample ID No: EETNE/AUG/05/23

Date of Report: 31/08/23
Date of sample receipt: 24/08/23

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500: 2012	
					Acceptable limit	Permissible limit
8	Dissolved Oxygen	mg/L	8.4	APHA 23rd Edition,4500-O C,Page:4-146	--	--
9	Chloride	mg/L	14.3	APHA 23rd Edition,4500-Cl⁻ B,Page:4-75	250	1000
10	Sulphate	mg/L	9.2	APHA 23rd Edition,4500-SO_4^{2-} E,Page:4-199	200	400
11	Nitrates	mg/L	2.4	APHA 23rd Edition,4500-NO_3^- B,Page:4-127	45	No relaxation
12	Residual Chlorine	mg/L	BDL	APHA 23rd Edition,4500-Cl B,Page:4-63	0.2	1.0
13	Fluoride	mg/L	0.24	APHA 23rd Edition,4500-F D,Page:4-90	1.0	1.5
14	Copper	mg/L	0.031	APHA 23rd Edition,3111 B,Page:3-20	0.05	1.5
15	Iron(as Fe)	mg/L	0.245	APHA 23rd Edition,3111 B,Page:3-20	0.3	No relaxation
16	Cadmium	mg/L	BDL	APHA 23rd Edition,3111 B,Page:3-20	0.003	No relaxation
17	Lead(as Pb)	mg/L	BDL	APHA 23rd Edition,3111 B,Page:3-20	0.01	No relaxation
18	Zinc	mg/L	0.230	APHA 23rd Edition,3111 B,Page:3-20	5	15
19	Chromium Total	mg/L	BDL	APHA 23rd Edition,3111 B,Page:3-20	0.05	No relaxation
20	Manganese	mg/L	0.034	APHA 23rd Edition,3111 B,Page:3-20	0.1	0.3
21	Selenium	mg/L	BDL	APHA 23rd Edition,3114A,Page:3-36	0.01	No relaxation

NOTE: (BOD) Biochemical Oxygen Demand, (COD) Chemical Oxygen Demand, (TDS) Total Dissolved Solids, (BDL) Below Detection Limit.

For Envision Enviro Technologies North East

Envision Enviro Technologies North East Guwahati-3

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

Note: i) The results relate only to the parameters tested and item sampled.
ii) The test report shall not be reproduced except in full, without written approval of laboratory.z

End of report

Page 2 of 2

House No. 6, 1st Floor, Sankardev Path, Pub-Sarania, Chandmari, Guwahati-781003, Assam
Phone : +91 98640 10097 / 70028 10116 ♦ e-mail : envisionghy@gmail.com

Ground water quality CP-3

en-vision
Enviro Technologies North East
Technologies for better tomorrow

RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

TC-7669

TEST REPORT:
Report No: 230831_1503163_2
ULR No: TC766923000000115P
Sample ID No: EETNE/AUG/19/23
Test Starting Date: 25/08/2023

Date of Report: 31/08/23
Date of sample receipt: 25/08/2023
Test completion Date: 31/08/23

Name & Address of Client	M/s. ANDRITZ HYDRO PVT. LTD., LKHEP Project ,village- Longku ,Dist- Dima Hasao, Pin- 788931.					
Sample Description	Type: Raw water				Source: borewell	
Sample collected by	M/s. En-vision Enviro Technologies North East					
Sample Collection Particulars	Date 25/08/2023	Time 10:45 A.M	Temperature 31°C	pH 6.71	Quantity Drawn:4L	Sampling Method: EETNE/SOP/02

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
1	pH	---	6.68	APHA 23rd Edition,4500 H^+,Page:4-95	6.5-8.5
2	Turbidity	NTU	4.6	APHA 23rd Edition,2130,Page:2-13	5
3	TDS	mg/L	68.6	APHA 23rd Edition,2540 C, Page :2-69	2000
4	TSS	mg/L	81.2	APHA 23rd Edition,2540,Page:2-70	----
5	Oil and Grease	mg/L	<5	APHA 23rd Edition,5520 B,Page:5-42	----
6	Dissolved Oxygen	mg/L	5.4	APHA 23rd Edition,4500-O C,Page:4-146	6
7	Total hardness	mg/L	72.5	APHA 23rd Edition,2340 B,Page:2-48	600
8	Calcium	mg/L	38.6	APHA 23rd Edition,3500-Ca B,Page:3-69	200
9	Magnesium	mg/L	22.4	APHA 23rd Edition,3500-Mg B,Page:3-86	100
10	Total Alkalinity	mg/L	35.4	APHA 23rd Edition,2320,Page:2-37	600
11	Sulphate	mg/L	26.2	APHA 23rd Edition,4500-SO_4^{2-}E,Page:4-199	400
12	Nitrates	mg/L	4.4	APHA 23rd Edition,4500-NO_3^-B,Page:4-127	20
13	Phosphate	mg/L	<0.02	APHA 23rd Edition,4500-P,Page:4-163	----
14	Salinity	%	0.2	APHA 23rd Edition,2520B,Page:2-60	----
15	Conductivity	µS/cm	81.3	APHA 23rd Edition,2520B,Page:2-60	2500

Page 1 of 2

House No. 6, 1st Floor, Sankardev Path, Pub-Sarania, Chandmari, Guwahati-781003, Assam.
Phone : +91 93640 10097 / 70028 10116 ● e-mail : envisionghy@gmail.com

en-VISION
Enviro Technologies North East
"Technologies for better tomorrow"

RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

TC-7669

Sample ID No: EETNE/AUG/19/23 **Date of sample receipt: 25/08/2023**
Test Starting Date: 25/08/2023 **Test completion Date: 31/08/2023**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
16	Arsenic	mg/L	BDL	APHA 23rd Edition,3114A,Page:3-36	------
17	Iron(as Fe)	mg/L	0.71	APHA 23rd Edition,3500-Fe B,Page:3-80	------
18	Total Coliform	MPN/100	2	APHA 23rd Edition,9222B,Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition,9222 D,Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	4.2	APHA 23rd Edition,5210B,Page:5-6	------
21	COD	mg/L	61	APHA 23rd Edition,5220 b,Page:5-18	------

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

For Envision Enviro Technologies North East, Guwahati

Envision Enviro Technologies North East Guwahati-3

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
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 19 are analyzed by Department of Chemistry,B.Borooah College as per our MOU.

End of report

House No. 6, 1st Floor, Sankardev Path, Pub-Sarania, Chandmari, Guwahati-781003, Assam
Phone : +91 98640 10097 / 70028 18116 e-mail : envisionghy@gmail.com

Ground water quality CP-4

ABNS SCIENTIFIC SERVICES

এবিএনএচ চাইন্টিফিক চার্ভিচেচ

এবীএনএস সাইন্টীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

केतेकी पथ, रैडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम

TC-10736

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC1073623000000727F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Near AP 1/0**
(Latitude: 25.985139N, Longitude: 92.92598E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Physical & Chemical Test Findings:

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
A.	**Organopletic and Physical Parameters**					
1	Color	IS: 3025-(part4): 1983 Reaf. 2012	Hazen	2	5 Max	15 Max
2	Odour	IS: 3025-(part5): 1983	.....	Agreeable	Agreeable	Agreeable
3	Taste	IS: 3025-(part8): 1983	....	Agreeable	Agreeable	Agreeable
4	pH value	IS: 3025-(part11): 1983 Reaf. 2012	....	7.15	6.5-8.5	No Relaxation
5	Turbidity	IS: 3025-(part10): 1983 Reaf. 2012	NTU	4.83	1 Max	5 Max
6	TDS	IS: 3025-(part16): 1983 Reaf. 2012	mg/l	96.0	500 Max	2000
7	Conductance	IS 3025 Part 14	mS/cm	0.325	-	-

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023
Authorized Signatory

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- Results relate only to the parameters tested.

ABNS SCIENTIFIC SERVICES

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033. Assam

কেতেকী পথ, রৈডিসন ব্লু কে পাস, এন এইচ ২৬, গুবাহাটী ৬৮১০৩৩, অসম

TC-10736

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC10736230000000727F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Near AP 1/0**
(Latitude: 25.985139N, Longitude: 92.92598E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
B. General parameters Concerning Substances Undesirable in Excessive Amounts						
1	Total Alkinity as $CaCO_3$	IS: 3025-(part23): 1986 Reaf. 2009	mg/l	86.0	200 Max	600 Max
2	Total Hardness as $CaCO_3$	IS: 3025-(part21) 2009	mg/l	92.0	200 Max	600 Max
3	Calcium as Ca	IS: 3025-(part40): 1991 Reaf. 2009	mg/l	26.58	75 Max	200 Max
4	Magnesium as Mg	IS: 3025-(part46): 1994 Reaf. 2009	mg/l	7.62	30 Max	100 Max
5	Sulphate as SO_4	IS: 3025-(part24): 1983 Reaf. 2009	mg/l	32.5	200 Max	400 Max
6	Nitrate as NO_3	IS: 3025-(part34): 1988 Reaf. 2009	mg/l	2.86	45 Max	No Relaxation
7	Chloride as Cl	IS: 3025-(part32): 1988 Reaf. 2009	mg/l	29.3	250 Max	1000 Max
8	Fluoride as F	IS: 3025-(part60): 2008	mg/l	0.92	1 Max	1.5 Max

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

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এবীএনএস साइंटीफीक सर्वीसेज

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

केतेकी पथ, रेडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/30 | **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Near AP 1/0**
(Latitude: 25.985139N, Longitude: 92.92598E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
1	Temperature	IS 3025 (Part 09) : 1984	°C	18.9	NA	NA
2	Phenolphthalein Alkinity as $CaCO_3$	IS: 3025-(part23): 1986 Reaf, 2009	mg/l	NIL	NA	NA
3	DO	APHA 22nd Edtn, 2012, 4500 O-C	mg/l	5.8	NA	NA
4	BOD	IS 3025 (Part 44)1993; Rffm. 2017	mg/l	1.8	NA	NA
5	COD	IS 3025 (Part 58)2006; Rffm. 2019	mg/l	5.6	NA	NA
6	Sodium	IS 3025 (Part 45)	mg/l	3.76	NA	NA
7	Potassium	IS 3025 (Part 48) : 1994, Rffm. 2003	mg/l	3.10	NA	NA
8	Nitrite Nitrogen as N	IS 3025 (Part 34) : 1988,	mg/l	<0.2	NA	NA
9	Ammonium (NH_3-N)	IS: 3025-(part34)	mg/l	<0.2	0.5 Max	No Relaxation
10	Boron as B	IS: 3025-(part57): 2005 Reaf, 2010	mg/l	<0.05	0.5 Max	1.0
C. Microbiological Test parameters						
1	Total coliform	IS 1622-1981, Reff. 2014	MPN/100 ml	15	No Relaxation	No Relaxation
2	Faecal coliforms	IS 1622-1981, Reff. 2014	MPN/100 ml	Not Detected	No Relaxation	No Relaxation

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati Assam

31/12/2023
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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৭, গুৱাহাটী ৭৮১০৩৩, অসম

TC-10736

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC1073623000000726F | **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Near 87/0**
(Latitude: 25.697083N, Longitude: 92.807244E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Physical & Chemical Test Findings:

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
A.	**Organoleptic and Physical Parameters**					
1	Color	IS: 3025-(part4): 1983 Reaf, 2012	Hazen	3	5 Max	15 Max
2	Odour	IS: 3025-(part5): 1983	—	Agreeable	Agreeable	Agreeable
3	Taste	IS: 3025-(part8): 1983	—	Agreeable	Agreeable	Agreeable
4	pH value	IS: 3025-(part11): 1983 Reaf, 2012	—	7.13	6.5-8.5	No Relaxation
5	Turbidity	IS: 3025-(part10): 1983 Reaf, 2012	NTU	5.10	1 Max	5 Max
6	TDS	IS: 3025-(part16): 1983 Reaf, 2012	mg/l	112.0	500 Max	2000
7	Conductance	IS 3025 Part 14	mS/cm	0.298	-	-

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৭, গুৱাহাটী ৭৮১০৩৩, অসম

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TC-10736

TEST REPORT

ULR Number: TC10736230000000726F | **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Near 87/0**
(Latitude: 25.697083N, Longitude: 92.807244E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
B. General parameters Concerning Substances Undesirable in Excessive Amounts						
1	Total Alkinity as $CaCO_3$	IS: 3025-(part23): 1986 Reaf, 2009	mg/l	**98.0**	200 Max	600 Max
2	Total Hardness as $CaCO_3$	IS: 3025-(part21) 2009	mg/l	**106.0**	200 Max	600 Max
3	Calcium as Ca	IS: 3025-(part40): 1991 Reaf, 2009	mg/l	**32.26**	75 Max	200 Max
4	Magnesium as Mg	IS: 3025-(part46): 1994 Reaf, 2009	mg/l	**9.74**	30 Max	100 Max
5	Sulphate as SO_4	IS: 3025-(part24): 1983 Reaf, 2009	mg/l	**44.0**	200 Max	400 Max
6	Nitrate as NO_3	IS: 3025-(part34): 1988 Reaf, 2009	mg/l	**3.16**	45 Max	No Relaxation
7	Chloride as Cl	IS: 3025-(part32): 1988 Reaf, 2009	mg/l	**33.8**	250 Max	1000 Max
8	Fluoride as F	IS: 3025-(part60): 2008	mg/l	**1.02**	1 Max	1.5 Max

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS

31/12/2023

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এবীএনএস সাইंटीफीक सर्वीसेज

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

केतेकी पथ, रैडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/29 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Near 87/0**
(Latitude: 25.697083N, Longitude: 92.807244E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
1	Temperature	IS 3025 (Part 09) : 1984	°C	18.7	NA	NA
2	Phenolphthalein Alkinity as $CaCO_3$	IS: 3025 (part23): 1986 Reaf, 2009	mg/l	NIL	NA	NA
3	DO	APHA 22nd Edtn., 2012, 4500 O-C	mg/l	6.2	NA	NA
4	BOD	IS 3025 (Part 44)1993; Rffm. 2017	mg/l	1.6	NA	NA
5	COD	IS 3025 (Part 58)2006; Rffm. 2019	mg/l	6.0	NA	NA
6	Sodium	IS 3025 (Part 45)	mg/l	4.82	NA	NA
7	Potassium	IS 3025 (Part 48) : 1994, Rffm. 2003	mg/l	2.64	NA	NA
8	Nitrite Nitrogen as N	IS 3025 (Part 34) : 1988,	mg/l	<0.2	NA	NA
9	Ammonium (NH_3-N)	IS: 3025 (part34)	mg/l	<0.2	0.5 Max	No Relaxation
10	Boron as B	IS: 3025 (part57): 2005 Reaf, 2010	mg/l	<0.05	0.5 Max	1.0
C. Microbiological Test parameters						
1	Total coliform	IS 1622-1981, Reff. 2014	MPN/100 ml	13	No Relaxation	No Relaxation
2	Faecal coliforms	IS 1622-1981, Reff. 2014	MPN/100 ml	Not Detected	No Relaxation	No Relaxation

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati

31/12/2023

Authorized Signatory

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H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam
কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৭, গুৱাহাটী ৩৮১০৩৩, অসম
Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951
TC-10736

TEST REPORT

ULR Number: TC107362300000072SF **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Near 58/0**
(Latitude: 25.750737N, Longitude: 92.897803E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Physical & Chemical Test Findings:

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
A.	**Organopletic and Physical Parameters**					
1	Color	IS: 3025-(part4): 1983 Reaf, 2012	Hazen	2	5 Max	15 Max
2	Odour	IS: 3025-(part5): 1983	.....	Agreeable	Agreeable	Agreeable
3	Taste	IS: 3025-(part8): 1983	.....	Agreeable	Agreeable	Agreeable
4	pH value	IS: 3025-(part11): 1983 Reaf, 2012	.....	7.13	6.5-8.5	No Relaxation
5	Turbidity	IS: 3025-(part10): 1983 Reaf, 2012	NTU	4.76	1 Max	5 Max
6	TDS	IS: 3025-(part16): 1983 Reaf, 2012	mg/l	98.0	500 Max	2000
7	Conductance	IS 3025 Part 14	mS/cm	0.316	-	-

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

ABNS Scientific Services Guwahati, Assam

31/12/2023
Authorized Signatory

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এবীএনএস সাइंटीफीक सर्वीसेज

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

केतेकी पथ, रेडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम

TC-10736

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC107362300000072SF **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Near 58/0**
(Latitude: 25.750737N, Longitude: 92.897803E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
B. General parameters Concerning Substances Undesirable in Excessive Amounts						
1	Total Alkinity as $CaCO_3$	IS: 3025-(part23): 1986 Reaf, 2009	mg/l	**118.0**	200 Max	600 Max
2	Total Hardness as $CaCO_3$	IS: 3025-(part21) 2009	mg/l	**84.0**	200 Max	600 Max
3	Calcium as Ca	IS: 3025-(part40): 1991 Reaf, 2009	mg/l	**38.72**	75 Max	200 Max
4	Magnesium as Mg	IS: 3025-(part46): 1994 Reaf, 2009	mg/l	**10.96**	30 Max	100 Max
5	Sulphate as SO_4	IS: 3025-(part24): 1983 Reaf, 2009	mg/l	**37.0**	200 Max	400 Max
6	Nitrate as NO_3	IS: 3025-(part34): 1988 Reaf, 2009	mg/l	**2.86**	45 Max	No Relaxation
7	Chloride as Cl	IS: 3025-(part32): 1988 Reaf, 2009	mg/l	**29.2**	250 Max	1000 Max
8	Fluoride as F	IS: 3025-(part60): 2008	mg/l	**0.93**	1 Max	1.5 Max

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023
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এবীএনএস সাইণ্টীফীক সর্বসিজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৭, গুৱাহাটী ৩৮১০৩৩, অসম

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/28 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034, ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Near 58/0**
(Latitude: 25.750737N, Longitude: 92.897803E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
1	Temperature	IS 3025 (Part 09) : 1984	°C	18.3	NA	NA
2	Phenolphthalein Alkinity as $CaCO_3$	IS: 3025-(part23): 1986 Reaf, 2009	mg/l	NIL	NA	NA
3	DO	APHA 22nd Edtn., 2012, 4500 O-C	mg/L	5.2	NA	NA
4	BOD	IS 3025 (Part 44)1993; Rffm. 2017	mg/l	1.8	NA	NA
5	COD	IS 3025 (Part 58)2006; Rffm. 2019	mg/l	7.0	NA	NA
6	Sodium	IS 3025 (Part 45)	mg/l	6.52	NA	NA
7	Potassium	IS 3025 (Part 48) : 1994, Rffm. 2003	mg/l	3.10	NA	NA
8	Nitrite Nitrogen as N	IS 3025 (Part 34) : 1988,	mg/l	<0.2	NA	NA
9	Ammonium (NH_3-N)	IS: 3025-(part34)	mg/l	<0.2	0.5 Max	No Relaxation
10	Boron as B	IS: 3025-(part57): 2005 Reaf, 2010	mg/l	<0.05	0.5 Max	1.0
C. Microbiological Test parameters						
1	Total coliform	IS 1622-1981, Reff. 2014	MPN/100 ml	7	No Relaxation	No Relaxation
2	Faecal coliforms	IS 1622-1981, Reff. 2014	MPN/100 ml	Not Detected	No Relaxation	No Relaxation

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

ABNS Scientific Services ABNS Guwahati, Assam

31/12/2023

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৭, গুৱাহাটী ৭৮১০৩৩, অসম

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TC-10736

TEST REPORT

ULR Number: TC10736230000000724F	**Report date: 31/12/2023**
Name & Address of the Customer: **M/S SALASAR TECHNO ENGINEERING LIMITED** 2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR, LALGANESH GUWAHATI, KAMPUP(M), GUWAHATI-781034. ASSAM	
Sample Description: **Drinking Water** Sampling Location: **Near 37/1** (Latitude: 25.848852N, Longitude: 92.946247E) Source: Tubewell	Date of sampling: 23/12/2023 Analysis Start Date: 24/12/2023 Analysis End Date: 30/12/2023
Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023	

ANALYSIS RESULT

Physical & Chemical Test Findings:

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
A.	**Organopletic and Physical Parameters**					
1	Color	IS: 3025-(part4): 1983 Reaf, 2012	Hazen	2	5 Max	15 Max
2	Odour	IS: 3025-(part5): 1983	.....	Agreeable	Agreeable	Agreeable
3	Taste	IS: 3025-(part8): 1983	.....	Agreeable	Agreeable	Agreeable
4	pH value	IS: 3025-(part11): 1983 Reaf, 2012	.....	7.10	6.5-8.5	No Relaxation
5	Turbidity	IS: 3025-(part10): 1983 Reaf, 2012	NTU	6.52	1 Max	5 Max
6	TDS	IS: 3025-(part16): 1983 Reaf, 2012	mg/l	172.0	500 Max	2000
7	Conductance	IS 3025 Part 14	mS/cm	0.325	-	-

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, রেডিসন ব্লু কে পাস, এন এইচ ২৭, গুবাহাটী ৭৮১০৩৩, অসম

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TC-10736

TEST REPORT

ULR Number: TC1073623000000724F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Near 37/1**
(Latitude: 25.848852N, Longitude: 92.946247E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
	B. General parameters Concerning Substances Undesirable in Excessive Amounts					
1	Total Alkinity as $CaCO_3$	IS: 3025-(part23): 1986 Reaf, 2009	mg/l	**136.0**	200 Max	600 Max
2	Total Hardness as $CaCO_3$	IS: 3025-(part21) 2009	mg/l	**116.0**	200 Max	600 Max
3	Calcium as Ca	IS: 3025-(part40): 1991 Reaf, 2009	mg/l	**56.32**	75 Max	200 Max
4	Magnesium as Mg	IS: 3025-(part46): 1994 Reaf, 2009	mg/l	**22.10**	30 Max	100 Max
5	Sulphate as SO_4	IS: 3025-(part24): 1983 Reaf, 2009	mg/l	**42.0**	200 Max	400 Max
6	Nitrate as NO_3	IS: 3025-(part34): 1988 Reaf, 2009	mg/l	**4.19**	45 Max	No Relaxation
7	Chloride as Cl	IS: 3025-(part32): 1988 Reaf, 2009	mg/l	**31.5**	250 Max	1000 Max
8	Fluoride as F	IS: 3025-(part60): 2008	mg/l	**0.86**	1 Max	1.5 Max

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

Scientific Services * ABNS * Ganeshguri, Assam

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এবীএনএস সাइंटीफीक सर्वीसेज

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

केतेकी पथ, रैडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम

Email: info@abnsscientific.com, abnsscientific[illegible] Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/27 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Near 37/1**
(Latitude: 25.848852N, Longitude: 92.946247E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
1	Temperature	IS 3025 (Part 09) : 1984	°C	18.5	NA	NA
2	Phenolphthalein Alkinity as $CaCO_3$	IS: 3025-(part23): 1986 Reaf, 2009	mg/l	NIL	NA	NA
3	DO	APHA 22nd Edtn., 2012, 4500 O-C	mg/l	4.8	NA	NA
4	BOD	IS 3025 (Part 44)1993; Rffm. 2017	mg/l	1.6	NA	NA
5	COD	IS 3025 (Part 58)2006; Rffm. 2019	mg/l	8.0	NA	NA
6	Sodium	IS 3025 (Part 45)	mg/l	5.13	NA	NA
7	Potassium	IS 3025 (Part 48) : 1994, Rffm. 2003	mg/l	2.16	NA	NA
8	Nitrite Nitrogen as N	IS 3025 (Part 34) : 1988,	mg/l	<0.2	NA	NA
9	Ammonium (NH_3-N)	IS: 3025-(part34)	mg/l	<0.2	0.5 Max	No Relaxation
10	Boron as B	IS: 3025-(part57): 2005 Reaf, 2010	mg/l	<0.05	0.5 Max	1.0
C. Microbiological Test parameters						
1	Total coliform	IS 1622-1981, Reff. 2014	MPN/100 ml	11	No Relaxation	No Relaxation
2	Faecal coliforms	IS 1622-1981, Reff. 2014	MPN/100 ml	Not Detected	No Relaxation	No Relaxation

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

Scientific Services * ABNS * Guwahati, Assam

31/12/2023

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H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৭, গুৱাহাটী ৭৮১০৩৩, অসম

TC-10736

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC1073623000000723F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Lalungdubi Gaon**
(Latitude: 25.90285N, Longitude: 92.942726E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Physical & Chemical Test Findings:

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
A.	**Organopletic and Physical Parameters**					
1	Color	IS: 3025-(part4): 1983 Reaf, 2012	Hazen	3	5 Max	15 Max
2	Odour	IS: 3025-(part5): 1983	—	Agreeable	Agreeable	Agreeable
3	Taste	IS: 3025-(part8): 1983	—	Agreeable	Agreeable	Agreeable
4	pH value	IS: 3025-(part11): 1983 Reaf, 2012	—	7.21	6.5-8.5	No Relaxation
5	Turbidity	IS: 3025-(part10): 1983 Reaf, 2012	NTU	13.0	1 Max	5 Max
6	TDS	IS: 3025-(part16): 1983 Reaf, 2012	mg/l	252.0	500 Max	2000
7	Conductance	IS 3025 Part 14	mS/cm	0.345	-	-

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৭, গুৱাহাটী ৭৮১০৩৩, অসম

TC-10736

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

ULR Number: TC1073623000000723F **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Lalungdubi Gaon**
(Latitude: 25.90285N, Longitude: 92.942726E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
B. General parameters Concerning Substances Undesirable in Excessive Amounts						
1	Total Alkinity as $CaCO_3$	IS: 3025-(part23): 1986 Reaf, 2009	mg/l	**182.0**	200 Max	600 Max
2	Total Hardness as $CaCO_3$	IS: 3025-(part21) 2009	mg/l	**136.0**	200 Max	600 Max
3	Calcium as Ca	IS: 3025-(part40): 1991 Reaf, 2009	mg/l	**42.12**	75 Max	200 Max
4	Magnesium as Mg	IS: 3025-(part46): 1994 Reaf, 2009	mg/l	**18.62**	30 Max	100 Max
5	Sulphate as SO_4	IS: 3025-(part24): 1983 Reaf, 2009	mg/l	**63.0**	200 Max	400 Max
6	Nitrate as NO_3	IS: 3025-(part34): 1988 Reaf, 2009	mg/l	**5.73**	45 Max	No Relaxation
7	Chloride as Cl	IS: 3025-(part32): 1988 Reaf, 2009	mg/l	**70.24**	250 Max	1000 Max
8	Fluoride as F	IS: 3025-(part60): 2008	mg/l	**1.02**	1 Max	1.5 Max

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, রেডিসন ব্লু কে পাস, এন এইচ ২৭, গুবাহাটী ৩৮১০৩৩, অসম

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/26 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Drinking Water**
Sampling Location: **Lalungdubi Gaon**
(Latitude: 25.90285N, Longitude: 92.942726E)
Source: Tubewell

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Test Method	Unit	Result	Norms as per IS: 10500, 2012 (2nd Rev.)	
					Acceptable Limit	Permissible Limit
1	Temperature	IS 3025 (Part 09) : 1984	°C	19.3	NA	NA
2	Phenolphthalein Alkinity as $CaCO_3$	IS: 3025-(part23): 1986 Reaf, 2009	mg/l	Nil.	NA	NA
3	DO	APHA 22nd Edtn., 2012, 4500 O-C	mg/l	5.6	NA	NA
4	BOD	IS 3025 (Part 44)1993; Rffm. 2017	mg/l	3.0	NA	NA
5	COD	IS 3025 (Part 58)2006; Rffm. 2019	mg/l	10.0	NA	NA
6	Sodium	IS 3025 (Part 45)	mg/l	6.18	NA	NA
7	Potassium	IS 3025 (Part 48) : 1994, Rffm. 2003	mg/l	5.22	NA	NA
8	Nitrite Nitrogen as N	IS 3025 (Part 34) : 1988,	mg/l	<0.2	NA	NA
9	Ammonium (NH_3-N)	IS: 3025-(part34)	mg/l	<0.2	0.5 Max	No Relaxation
10	Boron as B	IS: 3025-(part57): 2005 Reaf, 2010	mg/l	<0.05	0.5 Max	1.0
C. Microbiological Test parameters						
1	Total coliform	IS 1622-1981, Reff. 2014	MPN/100 ml	17	No Relaxation	No Relaxation
2	Faecal coliforms	IS 1622-1981, Reff. 2014	MPN/100 ml	Not Detected	No Relaxation	No Relaxation

For ABNS Scientific Services,

Report reviewed by: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023

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Annexure 16 RO Water Quality -CP-2

en-vision
Enviro Technologies North East
Technologies for better tomorrow

Recognized by Pollution Control Board, Assam

TC-7669

TEST REPORT:
Report No: 231211_1503163_07
ULR No: TC766923000000175P
Sample ID No: EETNE/DEC/07/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.					
Sample Description	Type: Drinking Water			Source: RO		
Sample collected by	M/s. En-vision Enviro Technologies North East					
Sample Collection Particulars	Date 30/11/2023	Time 1:20 P.M	Temperature 28°C	pH 7.2	Quantity Drawn:4L	Sampling Method: EETNE/SOP/02

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500: 2012	
					Acceptable limit	Permissible limit
1	pH	---	7.32	APHA 23rd Edition 2017,4500 H^+ B, Page:4-95 / IS 3025 (Part 11) Electrometric Method	6.5-8.5	No relaxation
2	Turbidity	NTU	<1	IS 3025 (Part 4) Nephelometric Method	1.0	5.0
3	TDS	mg/L	87.2	IS 3025 (Part 16)	500	2000
4	Total hardness	mg/L	4	IS 3025 (Part 21)	200	600
5	Calcium	mg/L	BDL	IS 3025 (Part 40) EDTA Titrimetric Method	75	200
6	Magnesium	mg/L	BDL	IS 3025 (Part 46)	30	100
7	Total Alkalinity	mg/L	15	IS 3025 (Part 23)	200	600
8	Chloride	mg/L	12.4	APHA 23rd Edition 2017,4500-Cl^- B,Page:4-75	250	1000
9	Sulphate	mg/L	5.2	APHA 23rd Edition 2017,4500-SO_4^{2-} E,Page:4-199	200	400
10	Nitrate	mg/L	3.8	APHA 23rd Edition 2017,4500-NO_3^- B,Page:4-127	45	No relaxation

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Recognized by Pollution Control Board, Assam

TC-7669

Sample ID No: EETNE/DEC/07/23 **Date of sample receipt: 04/12/2023**
Test Starting Date: 04/12/2023 **Test completion Date: 11/12/23**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500: 2012	
					Acceptable limit	Permissible limit
11	Fluoride	mg/L	0.37	APHA 23rd Edition 2017,4500-F D,Page:4-90	1.0	1.5
12	Copper	mg/L	0.041	APHA 23rd Edition 2017,3111 B,Page:3-20	0.05	1.5
13	Iron(as Fe)	mg/L	0.158	APHA 23rd Edition 2017,3500-Fe B,Page:3-80	0.3	No relaxation
14	Cadmium	mg/L	-BDL	APHA 23rd Edition 2017, 3111 B,Page:3-20	0.003	No relaxation
15	Lead	mg/L	BDL	APHA 23rd Edition 2017, 3111 B,Page:3-20	0.01	No relaxation
16	Zinc	mg/L	0.189	APHA 23rd Edition 2017, 3111 B,Page:3-20	5	15
17	Total Chromium	mg/L	BDL	APHA 23rd Edition 2017, 3111 B,Page:3-20	0.05	No relaxation
18	Manganese	mg/L	0.035	APHA 23rd Edition 2017, 3111 B,Page:3-20	0.1	0.3
19	Selenium	mg/L	BDL	APHA 23rd Edition 2017, 3114 B,Page:3-36	0.01	No relaxation
20	Arsenic	mg/L	BDL	APHA 23rd Edition 2017,3114 B,Page:3-36	0.01	No relaxation
21	BOD	mg/L	<2	APHA 23rd Edition 2017,5210B,Page:5-6 / IS 3025 (Part 44)	--	--
22	COD	mg/L	<5	APHA 23rd Edition 2017, 5220-B, Page No: 5-18	--	--

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test done by

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

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. 8 to 20 are analyzed by Department of Chemistry,B.Borooah College as per our MOU.

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Annexure 17 Quality of water from Sedimentation tanks and waste water

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RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

TEST REPORT:
Report No: 231211_1503163_14
ULR No: TC766923000000182P
Sample ID No: EETNE/DEC/14/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.					
Sample Description	Type: Surface Water				Source: Adit Sedimentation Water	
Sample collected by	M/s. En-vision Enviro Technologies North East					
Sample Collection Particulars	Date 01/12/2023	Time 11:30 A.M	Temperature 28°C	pH 8.5	Quantity Drawn:2L	Sampling Method: EETNE/SOP/02

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
1	pH	—	8.45	APHA 23rd Edition 2017,4500-H+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	6.5-8.5
2	Turbidity	NTU	9.8	IS 3025 (Part 4)	5
3	TDS	mg/L	75.2	IS 3025 (Part 16)	2000
4	TSS	mg/L	83.1	IS 3025 (Part 18)	----
5	Oil and Grease	mg/L	<5	APHA 23rd Edition 2017,5520 B, Page:5-42	----
6	Dissolved Oxygen	mg/L	5.9	APHA 23rd Edition 2017,4500-O C,Page:4-146	----
7	Total hardness	mg/L	24	IS 3025 (Part 21)	600
8	Calcium	mg/L	15.8	IS 3025 (Part 40)	200
9	Magnesium	mg/L	6.2	IS 3025 (Part 46)	100
10	Total Alkalinity	mg/L	75	IS 3025 (Part 23)	600
11	Sulphate	mg/L	24.8	APHA 23rd Edition 2017,4500-SO_4^{2-} E,Page:4-199	400
12	Nitrates	mg/L	4.6	APHA 23rd Edition 2017,4500-NO_3^- B,Page:4-127	----
13	Phosphate	mg/L	<0.02	APHA 23rd Edition 2017, 4500-P D, Page no.4-163	----

Page 1 of 2

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Sample ID No: EETNE/DEC/14/23
Test Starting Date: 04/12/2023

Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
14	Salinity	%	0.3	APHA 23rd Edition 2017, 2520B, Page: 2-60	-----
15	Conductivity	µS/cm	118	APHA 23rd Edition 2017, 2510B, Page:2-58	2500
16	Arsenic	mg/L	BDL	APHA 23rd Edition 2017, 3114B, Page:3-36	0.05
17	Iron(as Fe)	mg/L	0.537	APHA 23rd Edition 2017,3500-Fe B,Page:3-80	-----
18	Total Coliform	MPN/100	3	APHA 23rd Edition 2017, 9222B, Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	NIL	APHA 23rd Edition 2017, 9222 D, Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	6.1	APHA 23rd Edition 2017,5210 B,Page:5-6/ IS 3025 (Part 44)	-----
21	COD	mg/L	34	APHA 23rd Edition 2017, 5220-B, Page No: 5-18	-----

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

Note: i) The results relate only to the parameters tested.
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RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

TEST REPORT:
Report No: 231211_1503163_08
ULR No: TC766923000000176P
Sample ID No: EETNE/DEC/08/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	**M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.**					
Sample Description	**Type: Wastewater**				**Source: Kitchen**	
Sample collected by	**M/s. En-vision Enviro Technologies North East**					
Sample Collection Particulars	**Date 30/11/2023**	**Time 11:15 A.M**	**Temperature 28°C**	**pH 7.1**	**Quantity Drawn:2L**	**Sampling Method: EETNE/SOP/02**

Sl. No.	Parameters	Unit	Result	Method Followed by	Permissible Limit
1.	pH	---	7.08	APHA 23rd Edition 2017,4500-H+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	5.5-9.0
2.	Total Suspended Solids	mg/L	94.3	APHA 23rd Edition 2017, 2540 D, Page no. 2-66	100
3.	Oil & Grease	mg/L	<5	APHA 23rd Edition 2017, 5520 B, Page no. 5-42	10
4.	BOD	mg/L	7	APHA 23rd Edition 2017, 5210 B, Page no:5-6 / IS 3025 (Part 44)	30
5.	COD	mg/L	28	APHA 23rd Edition 2017,5220 B, Page no:5-18	250
6.	Dissolved Oxygen	mg/L	6.1	APHA 23rd Edition,4500-O C, Page no:4-146	---

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

Note: i) The results relate only to the parameters tested.
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TEST REPORT:
Report No: 231211_1503163_11
ULR No: TC766923000000179P
Sample ID No: EETNE/DEC/11/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	**M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.**					
Sample Description	**Type: Wastewater**				**Source: Workmans Camp**	
Sample collected by	**M/s. En-vision Enviro Technologies North East**					
Sample Collection Particulars	**Date 30/11/2023**	**Time 12:10 P.M**	**Temperature 28°C**	**pH 7.1**	**Quantity Drawn:2L**	**Sampling Method: EETNE/SOP/02**

SL No.	Parameters	Unit	Result	Method Followed by	Permissible Limit
1.	pH	---	7.24	APHA 23rd Edition 2017 4500-H+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	5.5-9.0
2.	Total Suspended Solids	mg/L	98.6	APHA 23rd Edition 2017, 2540 D, Page no. 2-66	100
3.	Oil & Grease	mg/L	8.4	APHA 23rd Edition 2017, 5520 B, Page no. 5-42	10
4.	BOD	mg/L	9	APHA 23rd Edition 2017, 5210 B, Page no:5-6 / IS 3025 (Part 44)	30
5.	COD	mg/L	32	APHA 23rd Edition 2017,5220 B, Page no:5-18	250
6.	Dissolved Oxygen	mg/L	5.7	APHA 23rd Edition,4500-O C, Page no:4-146	---

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

For Envision Enviro Technologies North East, Guwanati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

Note: i) The results relate only to the parameters tested.
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TEST REPORT:
Report No: 231211_1503163_11
ULR No: TC766923000000179P
Sample ID No: EETNE/DEC/11/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	**M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.**					
Sample Description	**Type: Wastewater**				**Source: Workmans Camp**	
Sample collected by	**M/s. En-vision Enviro Technologies North East**					
Sample Collection Particulars	**Date 30/11/2023**	**Time 12:10 P.M**	**Temperature 28°C**	**pH 7.1**	**Quantity Drawn:2L**	**Sampling Method: EETNE/SOP/02**

SL No.	Parameters	Unit	Result	Method Followed by	Permissible Limit
1.	pH	---	7.24	APHA 23rd Edition 2017,4500-H+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	5.5-9.0
2.	Total Suspended Solids	mg/L	88.6	APHA 23rd Edition 2017, 2540 D, Page no. 2-66	100
3.	Oil & Grease	mg/L	7.4	APHA 23rd Edition 2017, 5520 B, Page no. 5-42	10
4.	BOD	mg/L	9	APHA 23rd Edition 2017, 5210 B, Page no:5-6 / IS 3025 (Part 44)	30
5.	COD	mg/L	25	APHA 23rd Edition 2017,5220 B, Page no:5-18	250
6.	Dissolved Oxygen	mg/L	5.7	APHA 23rd Edition,4500-O C, Page no:4-146	---

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

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TEST REPORT:
Report No: 231211_1503163_08
ULR No: TC766923000000176P
Sample ID No: EETNE/DEC/08/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	**M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.**					
Sample Description	**Type: Wastewater**				**Source: Kitchen**	
Sample collected by	**M/s. En-vision Enviro Technologies North East**					
Sample Collection Particulars	**Date 30/11/2023**	**Time 11:15 A.M**	**Temperature 28°C**	**pH 7.1**	**Quantity Drawn:2L**	**Sampling Method EETNE/SOP/02**

SL No.	Parameters	Unit	Result	Method Followed by	Permissible Limit
1.	pH	---	7.08	APHA 23rd Edition 2017,4500-H+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	5.5-9.0
2.	Total Suspended Solids	mg/L	94.3	APHA 23rd Edition 2017, 2540 D, Page no. 2-66	100
3.	Oil & Grease	mg/L	<5	APHA 23rd Edition 2017, 5520 B, Page no. 5-42	10
4.	BOD	mg/L	7	APHA 23rd Edition 2017, 5210 B, Page no:5-6 / IS 3025 (Part 44)	30
5.	COD	mg/L	28	APHA 23rd Edition 2017,5220 B, Page no.5-18	250
6.	Dissolved Oxygen	mg/L	6.1	APHA 23rd Edition,4500-O C, Page no:4-146	---

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

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TEST REPORT:
Report No: 231211_1503163_10
ULR No: TC766923000000178P
Sample ID No: EETNE/DEC/10/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	**M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.**					
Sample Description	**Type: Surface Water**				**Source: Water Treatment Plant Sediment Tank**	
Sample collected by	**M/s. En-vision Enviro Technologies North East**					
Sample Collection Particulars	**Date 30/11/2023**	**Time 11:55 A.M**	**Temperature 28°C**	**pH 6.5**	**Quantity Drawn:2L**	**Sampling Method: EETNE/SOP/02**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
1	pH	---	6.62	APHA 23rd Edition 2017,4500-H+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	6.5-8.5
2	Turbidity	NTU	1.3	IS 3025 (Part 4)	5
3	TDS	mg/L	68.1	IS 3025 (Part 16)	2000
4	TSS	mg/L	55.7	IS 3025 (Part 18)	----
5	Oil and Grease	mg/L	<5	APHA 23rd Edition 2017,5520 B, Page:5-42	----
6	Dissolved Oxygen	mg/L	7.8	APHA 23rd Edition 2017,4500-O C,Page:4-146	----
7	Total hardness	mg/L	28	IS 3025 (Part 21)	600
8	Calcium	mg/L	10.6	IS 3025 (Part 40)	200
9	Magnesium	mg/L	3.7	IS 3025 (Part 46)	100
10	Total Alkalinity	mg/L	15	IS 3025 (Part 23)	600
11	Sulphate	mg/L	21.3	APHA 23rd Edition 2017,4500-SO_4^{2-} E,Page:4-199	400
12	Nitrates	mg/L	3.9	APHA 23rd Edition 2017,4500-NO_3^- B,Page:4-127	----
13	Phosphate	mg/L	<0.02	APHA 23rd Edition 2017, 4500-P D, Page no:4-163	----

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Sample ID No: EETNE/DEC/10/23 **Date of sample receipt: 04/12/2023**
Test Starting Date: 04/12/2023 **Test completion Date: 11/12/23**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
14	Salinity	%	0.3	APHA 23rd Edition 2017, 2520B, Page: 2-60	-----
15	Conductivity	µS/cm	106	APHA 23rd Edition 2017, 2510B, Page:2-58	2500
16	Arsenic	mg/L	BDL	APHA 23rd Edition 2017, 3114B, Page:3-36	0.05
17	Iron(as Fe)	mg/L	0.313	APHA 23rd Edition 2017,3500-Fe B,Page:3-80	-----
18	Total Coliform	MPN/100	1	APHA 23rd Edition 2017, 9222B, Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition 2017, 9222 D, Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	3.2	APHA 23rd Edition 2017,5210 B,Page:5-6/ IS 3025 (Part 44)	-----
21	COD	mg/L	17.5	APHA 23rd Edition 2017, 5220-B, Page No: 5-18	-----

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

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

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RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

TEST REPORT:
Report No: 231211_1503163_06
ULR No: TC766923000000174P
Sample ID No: EETNE/DEC/06/23
Test Starting Date: 04/12/2023

Date of Report: 11/12/23
Date of sample receipt: 04/12/2023
Test completion Date: 11/12/23

Name & Address of Client	**M/s. Lower Kopili HEP Project. Near Lanka, Dist: Dima Hasao.**					
Sample Description	**Type: Surface Water**			**Source: Batching Plant Sediment Tank**		
Sample collected by	**M/s. En-vision Enviro Technologies North East**					
Sample Collection Particulars	**Date 30/11/2023**	**Time 10:30 A.M**	**Temperature 28°C**	**pH 8.4**	**Quantity Drawn:2L**	**Sampling Method: EETNE/SOP/02**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500: 2012
					Permissible Limit
1	pH	---	8.42	APHA 23rd Edition 2017,4500-H+ B, Page no: 4-95 / IS 3025 (Part 11) Electrometric Method	6.5-8.5
2	Turbidity	NTU	4.5	IS 3025 (Part 4)	5
3	TDS	mg/L	186.4	IS 3025 (Part 16)	2000
4	TSS	mg/L	91.3	IS 3025 (Part 18)	----
5	Oil and Grease	mg/L	<5	APHA 23rd Edition 2017,5520 B, Page:5-42	----
6	Dissolved Oxygen	mg/L	7.4	APHA 23rd Edition 2017,4500-O C,Page:4-146	----
7	Total hardness	mg/L	320	IS 3025 (Part 21)	600
8	Calcium	mg/L	121.8	IS 3025 (Part 40)	200
9	Magnesium	mg/L	67.2	IS 3025 (Part 46)	100
10	Total Alkalinity	mg/L	385.6	IS 3025 (Part 23)	600
11	Sulphate	mg/L	28.7	APHA 23rd Edition 2017,4500-SO_4^{2-} E,Page:4-199	400
12	Nitrates	mg/L	8.2	APHA 23rd Edition 2017,4500-NO_3^- B,Page:4-127	----
13	Phosphate	mg/L	<0.02	APHA 23rd Edition 2017, 4500-P D, Page no:4-163	----

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Sample ID No: EETNE/DEC/06/23 **Date of sample receipt: 04/12/2023**
Test Starting Date: 04/12/2023 **Test completion Date: 11/12/23**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012
					Permissible Limit
14	Salinity	%	0.4	APHA 23rd Edition 2017, 2520B, Page: 2-60	-----
15	Conductivity	µS/cm	310	APHA 23rd Edition 2017, 2510B, Page:2-58	2500
16	Arsenic	mg/L	BDL	APHA 23rd Edition 2017, 3114B, Page:3-36	0.05
17	Iron(as Fe)	mg/L	0.851	APHA 23rd Edition 2017,3500-Fe B,Page:3-80	-----
18	Total Coliform	MPN/100	2	APHA 23rd Edition 2017, 9222B, Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition 2017, 9222 D, Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	9.3	APHA 23rd Edition 2017,5210 B,Page:5-6/ IS 3025 (Part 44)	----
21	COD	mg/L	28.1	APHA 23rd Edition 2017, 5220-B, Page No: 5-18	-----

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory/Reviewed By

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 19 are analyzed by Department of Chemistry,B.Borooah College as per our MOU.

End of report

Page 2 of 2

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Mobile : +91 98592 32126 / 68110 96201 ♦ e-mail : envisionghy@gmail.com

Annexure 18 Soil quality Testing results

Soil testing results CP-1

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SOIL ANALYSIS REPORT

Rep.No: 230824_1502010_0

Date: 24/08/23

Name & Address of Client	M/s. BVG India Ltd, Midas Tower, 4th Floor, Rajiv Gandhi Infotech Park, Phase-1, Hinjwani
Sample Description	Soil collected from Project site(Package 1)
Date of Sampling	24.08.23
Sample collected by	M/s. En-vision Enviro Technologies North East

Sl No.	Soil Parameters	Unit	Result	Reference Method
1	pH	---	7.42	Potentiometric
2	Soil type	----	Loamy Sand	Hydrometer
	Sand	%	68.99	Hydrometer
	Clay	%	13.54	Hydrometer
	Silt	%	13.17	Hydrometer
3	Nitrogen	kg/ha	123.3	Alkaline $KMnO_4$
4	Phosphorus	mg/kg	45.3	Olsen method
5	Potassium	mg/kg	53.6	NH_4-acetate extraction
6	Electrical conductivity	mS/cm	2.25	Conductivity meter
7	Water holding capacity	%	40.6	Standard method

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Phone : +91 98640 10097 / 70026 10116 ♦ e-mail : envisionghy@gmail.com

Sl No.	Parameters	Unit	Result	Reference Method
8	Organic matter	%	1.44	Titrimetric
9	Salinity	mS/cm	2.36	Conductometric
10	Iron	g/kg	42.4	Flame AAS (mg/kg)
11	Copper	mg/kg	15.6	Flame AAS
12	Nickel	mg/kg	6.62	Flame AAS
13	Manganese	g/kg	18.2	Flame AAS (mg/kg)
14	Zinc	mg/kg	26.8	Flame AAS
15	Chlorides	mg/kg	132.8	Argentometric

For En-vision Enviro Technologies North East, Guwahati

EN-VISION ENVIRO TECHNOLOGIES NORTH EAST Guwahati -3

UTPAL BEZBARUAH
(Technical Manager)
Authorized signatory

Note: i) The results relate only to the parameter tested.
ii) The test report shall not be reproduced except in full, without written approval of laboratory.
iii) Parameters no. 4, 10 to 15 are analyzed by Department of Chemistry B.Borooah college as per MOU.

END OF REPORT

Soil Test results CP-4

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এবীএনএস সাইংটীফীক সর্বীসেজ

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

কেতেকী পথ, ৰেডিসন ব্লু কে পাস, এন এইচ ২৭, গুবাহাটী ৬৮১০৩৩, অসম

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/25 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Soil**
Sampling Location: Near AP 1/0
(Location GPS: 25.98537°N, 92.92491°E)
Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

Date of sampling: 24/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
1	pH value(1:2.5) at 25 Deg. C	None	6.09	IS 2720 (Part 26) 1987;Rffm:2011
2	Conductance	(mS/cm)	0.436	IS 14767 (2000)
3	Organic Carbon	%	1.79	IS 2720 (Part 22) 1972;Rffm:2010
4	Available Nitrogen	%	0.037	Soil testing manual, Department of Agriculture & Cooperation Ministry of Agriculture Government of India, 2011
5	Available Phosphorus	%	0.92	
6	Available Potassium	%	0.051	
7	Available Sulphur	%	0.044	
8	Zinc	mg/kg	302	
9	Copper	mg/kg	276	
10	Iron	mg/kg	924	
11	Manganese	mg/kg	205	
12	Boron	mg/kg	43	

Note: *The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services * ABNS * Guwahati, Assam

31/12/2023
Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

ABNS SCIENTIFIC SERVICES

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এবীएनएस साइंटीफीक सर्वीसेज

H-152, Keteki Path, near Radisson Blu, NH 27, Guwahati 781033, Assam

केतेकी पथ, रैडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/24 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Soil**
Sampling Location: Near 87/0
(Location GPS: 25.696493°N, 92.806508°E)
Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

Date of sampling: 24/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
1	pH value(1:2.5) at 25 Deg. C	None	5.83	IS 2720 (Part 26) 1987;Rffm:2011
2	Conductance	(mS/cm)	0.384	IS 14767 (2000)
3	Organic Carbon	%	1.51	IS 2720 (Part 22) 1972;Rffm:2010
4	Available Nitrogen	%	0.069	Soil testing manual, Department of Agriculture & Cooperation Ministry of Agriculture Government of India, 2011
5	Available Phosphorus	%	0.44	
6	Available Potassium	%	0.092	
7	Available Sulphur	%	0.032	
8	Zinc	mg/kg	296	
9	Copper	mg/kg	317	
10	Iron	mg/kg	788	
11	Manganese	mg/kg	160	
12	Boron	mg/kg	62	

Note: *The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023
Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

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এবীएनएस साइंटीफीक सर्वीसेज

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केतेकी पथ, रैडिसन ब्लू के पास, एन एइच २७, गुवाहाटी ७८१०३३, असम

Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/23 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Soil**
Sampling Location: Near 58/0
(Location GPS: 25.750729°N, 92.897825°E)
Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

Date of sampling: 24/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
1	pH value(1:2.5) at 25 Deg. C	None	6.15	IS 2720 (Part 26) 1987;Rffm:2011
2	Conductance	(mS/cm)	0.402	IS 14767 (2000)
3	Organic Carbon	%	1.32	IS 2720 (Part 22) 1972;Rffm:2010
4	Available Nitrogen	%	0.082	Soil testing manual, Department of Agriculture & Cooperation Ministry of Agriculture Government of India, 2011
5	Available Phosphorus	%	0.39	
6	Available Potassium	%	0.082	
7	Available Sulphur	%	0.025	
8	Zinc	mg/kg	319	
9	Copper	mg/kg	276	
10	Iron	mg/kg	1210	
11	Manganese	mg/kg	209	
12	Boron	mg/kg	72	

***Note**: The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services * ABNS * Guwahati, Assam

31/12/2023
Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

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Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/22 **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Soil**
Sampling Location: Near 37/1
(Location GPS: 25.848898°N, 92.946102°E)
Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
1	pH value(1:2.5) at 25 Deg. C	None	5.63	IS 2720 (Part 26) 1987;Rffm:2011
2	Conductance	(mS/cm)	0.432	IS 14767 (2000)
3	Organic Carbon	%	1.56	IS 2720 (Part 22) 1972;Rffm:2010
4	Available Nitrogen	%	0.091	Soil testing manual, Department of Agriculture & Cooperation Ministry of Agriculture Government of India, 2011
5	Available Phosphorus	%	0.27	
6	Available Potassium	%	0.091	
7	Available Sulphur	%	0.035	
8	Zinc	mg/kg	209	
9	Copper	mg/kg	280	
10	Iron	mg/kg	910	
11	Manganese	mg/kg	186	
12	Boron	mg/kg	54	

***Note**: The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah (TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023
Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

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Email: info@abnsscientific.com, abnsscientific@gmail.com Phone: 98640 68513, 98640 89951

TEST REPORT

Report Number: ABNS/EM/123123/21 | **Report date: 31/12/2023**

Name & Address of the Customer:

M/S SALASAR TECHNO ENGINEERING LIMITED
2ND FLOOR, 205, AMRIT ENCLAVE, GANAPATI NAGAR,
LALGANESH GUWAHATI, KAMPUP(M),
GUWAHATI-781034. ASSAM

Sample Description: **Soil**
Sampling Location: Lalungdubi Gaon
(Location GPS: 25.891291°N, 92.922225°E)
Ref: PO No: AS-SPOE/23-24/7, dated:21/04/2023

Date of sampling: 23/12/2023
Analysis Start Date: 24/12/2023
Analysis End Date: 30/12/2023

ANALYSIS RESULT

Sl. No.	Test Parameters	Unit	Result	Method
1	pH value(1:2.5) at 25 Deg. C	None	6.37	IS 2720 (Part 26) 1987;Rffm:2011
2	Conductance	(mS/cm)	0.392	IS 14767 (2000)
3	Organic Carbon	%	1.49	IS 2720 (Part 22) 1972;Rffm:2010
4	Available Nitrogen	%	0.027	Soil testing manual, Department of Agriculture & Cooperation Ministry of Agriculture Government of India, 2011
5	Available Phosphorus	%	0.19	
6	Available Potassium	%	0.087	
7	Available Sulphur	%	0.031	
8	Zinc	mg/kg	372	
9	Copper	mg/kg	319	
10	Iron	mg/kg	1020	
11	Manganese	mg/kg	297	
12	Boron	mg/kg	61	

Note: *The results relate to the parameter tested only.*

----------*End of Report*----------

For ABNS Scientific Services,

Report reviewed By: Dr. Bidyut J Sarmah ('TM)

Scientific Services ABNS Guwahati, Assam

31/12/2023
Authorized Signatory
(Dr. Mayur Jyoti Mahanta)

Soil Test reports CP-3

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Recognized by Pollution Control Board, Assam

SOIL ANALYSIS REPORT

Rep.No: 230825_1503163_0 **Date: 25/08/23**

Name & Address of Client	**M/s. ANDRITZ HYDRO PVT. LTD., LKHEP Project ,village-Longku ,Dist- Dima Hasao, Pin- 788931.**
Sample Description	**Pre Construction Stage**
Date of Sampling	**20/08/23**
Sample collected by	**M/s. En-vision Enviro Technologies North East**

Sl No.	Soil Parameters	Unit	Result	Reference Method
1	p^H	---	7.24	Potentiometric
2	Soil type	---	Silt highly organic clay	Hydrometer
	Permeability of soil	Cm/sec	1.1×10^{-6}	Constant head test method
	Sand	%	74.6	Hydrometer
	Clay	%	11.2	Hydrometer
	Silt	%	21.4	Hydrometer
3	Nitrogen	kg/ha	88.3	Alkaline $KMnO_4$
4	Phosphorus	mg/kg	10.8	Olsen method
5	Potassium	mg/Kg	32.4	NH_4-acetate extraction
6	Electrical conductivity	mS/cm	10	Conductivity Meter
7	Water holding capacity	%	20.5	Standard method
8	Organic matter	%	6.1	Titrimetric

Page 1 of 2

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Sl No.	Parameters	Unit	Result	Reference Method
9	Organic Carbon	%	4.14	Rapid Dichromate Oxidation Technique
10	Iron	g/kg	30.6	Flame AAS(mg/kg)
11	Copper	mg/kg	8.9	Flame AAS
12	Nickel	mg/kg	13.4	Flame AAS
13	Manganese	g/kg	7.6	Flame AAS(mg/kg)
14	Zinc	mg/kg	34.5	Flame AAS
15	Arsenic	mg/kg	4.2	HG- AAS
16	Cadmium	mg/kg	0.02	Flame AAS
17	Lead	mg/kg	4.4	Flame AAS
18	Chromium	mg/kg	6.8	Flameless AAS
19	Aluminum	mg/kg	BDL	Flameless AAS

For En-vision Enviro Technologies North East, Guwahati

UTPAL BEZBARUAH
(Technical Manager)
Authorised Signatory

Note: i) The results relate only to the parameter tested.
ii) The test report shall not be reproduced except in full, without written approval of laboratory.
iii) Parameter no.9 to 19 are analysed in B. Booroah College as per our MOU.

End of Report

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SOIL ANALYSIS REPORT

Rep.No: 230902_1503165_0 **Date: 25/08/23**

Name & Address of Client	**M/s. ANDRITZ HYDRO PVT. LTD., LKHEP Project ,village-Longku ,Dist- Dima Hasao, Pin- 788931.**
Sample Description	**NEAR VALVE HOUSE**
Date of Sampling	**20/08/23**
Sample collected by	**M/s. En-vision Enviro Technologies North East**

Sl No.	Soil Parameters	Unit	Result	Reference Method
1	p^H	---	6.79	Potentiometric
2	Soil type	---	Silt highly organic clay	Hydrometer
	Permeability of soil	Cm/sec	1.1×10^{-6}	Constant head test method
	Sand	%	60.2	Hydrometer
	Clay	%	11.4	Hydrometer
	Silt	%	28.4	Hydrometer
3	Nitrogen	kg/ha	0.086	Alkaline $KMnO_4$
4	Phosphorus	mg/kg	13.5	Olsen method
5	Potassium	mg/Kg	14	NH_4-acetate extraction
6	Electrical conductivity	mS/cm	16	Conductivity Meter
7	Water holding capacity	%	22	Standard method
8	Organic matter	%	0.65	Titrimetric

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Phone : +91 98640 10097 / 70026 10116 ♦ e-mail : envisionghy@gmail.com

Sl No.	Parameters	Unit	Result	Reference Method
9	Organic Carbon	%	4.19	Rapid Dichromate Oxidation Technique
10	Iron	g/kg	83.5	Flame AAS(mg/kg)
11	Copper	mg/kg	6.2	Flame AAS
12	Nickel	mg/kg	3.7	Flame AAS
13	Manganese	g/kg	63.12	Flame AAS(mg/kg)
14	Zinc	mg/kg	0.87	Flame AAS
15	Arsenic	mg/kg	0.003	HG- AAS
16	Cadmium	mg/kg	<0.001	Flame AAS
17	Lead	mg/kg	0.002	Flame AAS
18	Chromium	mg/kg	<0.001	Flameless AAS
19	Aluminum	mg/kg	BDL	Flameless AAS

For En-vision Enviro Technologies North East, Guwahati

UTPAL BEZBARUAH
(Technical Manager)
Authorised Signatory

Note: i) The results relate only to the parameter tested.
ii) The test report shall not be reproduced except in full, without written approval of laboratory.
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End of Report

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TC-7669

SOIL ANALYSIS REPORT

Rep.No: 230902_1503164_0 **Date: 25/08/23**

Name & Address of Client	**M/s. ANDRITZ HYDRO PVT. LTD., LKHEP Project ,village-Longku ,Dist- Dima Hasao, Pin- 788931.**
Sample Description	**NEAR SERVICE BAY**
Date of Sampling	**20/08/23**
Sample collected by	**M/s. En-vision Enviro Technologies North East**

Sl No.	Soil Parameters	Unit	Result	Reference Method
1	p^H	—	6.93	Potentiometric
2	Soil type	---	Silt highly organic clay	Hydrometer
	Permeability of soil	Cm/sec	1.1×10^{-5}	Constant head test method
	Sand	%	67.3	Hydrometer
	Clay	%	9.4	Hydrometer
	Silt	%	23.3	Hydrometer
3	Nitrogen	kg/ha	0.072	Alkaline $KMnO_4$
4	Phosphorus	mg/kg	11.4	Olsen method
5	Potassium	mg/Kg	14.6	NH_4-acetate extraction
6	Electrical conductivity	mS/cm	12	Conductivity Meter
7	Water holding capacity	%	18.4	Standard method
8	Organic matter	%	0.67	Titrimetric

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Sl No.	Parameters	Unit	Result	Reference Method
9	Organic Carbon	%	4.14	Rapid Dichromate Oxidation Technique
10	Iron	g/kg	88.6	Flame AAS(mg/kg)
11	Copper	mg/kg	5.8	Flame AAS
12	Nickel	mg/kg	3.4	Flame AAS
13	Manganese	g/kg	78.6	Flame AAS(mg/kg)
14	Zinc	mg/kg	11.2	Flame AAS
15	Arsenic	mg/kg	6.2	HG- AAS
16	Cadmium	mg/kg	0.01	Flame AAS
17	Lead	mg/kg	0.03	Flame AAS
18	Chromium	mg/kg	<0.02	Flameless AAS
19	Aluminum	mg/kg	BDL	Flameless AAS

For En-vision Enviro Technologies North East, Guwahati

UTPAL BEZBARUAH
(Technical Manager)
Authorised Signatory

Note: i) The results relate only to the parameter tested.
ii) The test report shall not be reproduced except in full, without written approval of laboratory.
iii) Parameter no.9 to 19 are analysed in B. Booroah College as per our MOU.

End of Report

Page **2** of **2**

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Annexure 19 DG Stack monitoring CP-2

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TEST REPORT

STACK ANALYSIS REPORT
Rep.No. SAR_1503163_01_335
Sample ID No.: EETNE/OCT/01/23

Date: 19/10/2023
ULR NO.: TC766923000000070F

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	: 13/10/2023 TO 19/10/2023
Sampling Instrument Used	: FLUE GAS ANALYZER/STACK KIT
Pollution Control Device, if any	: NO/YES
Ambient Temperature	: 25°C

SL.NO.	DATE OF SAMPLING	STACK DESCRIPTION	MODEL	PARAMETERS Particulate Matter (g/kwhr)
i)	13-10-2023	Stck attached to DG 1- 40 KVA	X3.6TAA-G2	0.028
ii)		Stck attached to DG 2- 125 KVA	2018	0.017
iii)		Stck attached to DG 3- 180 KVA	6CTA8.3-G2-1	0.016
iv)		Stck attached to DG 4- 250 KVA	6CTAA8.3G4	0.018
v)		Stck attached to DG 5- 500 KVA	3412-DITA-GP1	0.019
vi)		Stck attached to DG 6- 1000 KVA	KTA-3067-G	0.029

Method of analysis: IS 11255 Part-III : 2008 RA

Emission Standards for Diesel Engine for generator set :

Engine Power(P)	Parameter	Standards
19P<P≤56KW	Particulate Matter	0.03 g/kwhr
56<P≤560KW	Particulate Matter	0.02 g/kwhr
560<P≤800KW	Particulate Matter	0.03 g/kwhr

For Envision Enviro Technologies North East, Guwahati

Khairul Islam Sheikh
(Environmental Chemist)

Utpal Bezbaruah
(Technical Manager)/Authorized/Reviewed by

Note: i) The results relate to the tested parameters & items sample,
ii) The test report shall not be reproduced except in full, without written approval of laboratory.

----------END OF REPORT----------

Page 1 of 1

House No. 6, 1st Floor, Sankardev Path, Pub-Sarania, Chandmari, Guwahati-781003, Assam.

Phone : +91 8811085203 ♦ e-mail : envisionghy@gmail.com ♦ visit us at : www.en-vision.in

Annexure 20 : CP-2 -NOC from WRD from River water extraction valid till Dec, 2024

GOVT. OF ASSAM
OFFICE OF THE EXECUTIVE ENGINEER::WEST KARBI ANGLONG WATER RESOURCES DIVISION
DONGKAMUKAM.

No.EE/WRD/DNK/MISC/2022-23/08 **Dated - 30/03/2023**

To
The Chief Engineer,
Water Resources Department,
Assam Water Center,
Basistha, Guwahati - 29

Ref. No.WR(ED)Tech/7965/2023/6 (A) Dated:- 16/03/2023

Sub: Seeking permission for extraction of water from Kopili river for construction of 120 MW Lower Kopili Hydroelectric Project (Package-2) at Longku, Dima Hasao District, Assam.

Sir,

With reference to the subject cited above, I have the honour to inform you that as per your direction a joint field visit at the proposed location for extraction of water for the LKHP (package-2) was conducted on 28/03/2023. The inspection was done by AEE, Baithalangso WR Sub-Division and team along with Project Manager, 120 MW - LKHEP (package -2), (L&T) and Project Engineer, (L&T). And as per report of AEE it is found that extraction of water from river Kopili will be required for daily consumption like preparation of concrete and other activities for construction purpose only. Extraction of water will be at the rate of about 600 cum/day for the period of Jan' 2023 to Dec' 2024. So there will be no adverse affect to the flow of water as well as to the WRD structure downstream of the proposed site.

Yours faithfully

30/03/2023

Executive Engineer
West Karbi Anglong W.R. Division
Dongkamukam

Annexure 20 : CP-3 -NOC for surface water extarction taken from Gaon Bura

Date: 17-11-2023

To.

The GAON BURA
DISARBA
Dima Hasao, ASSAM-788931

Subject: seeking Permission for using Surface water.

Respected sir,

We would like to introduce our company M/S Andritz Hydra PVT LTD/ CP-3 contractor executing E&M works at 120MW Lower Kopili Hydro power project, Longku village, Dima Hasao district, Assam -788931.

We here by submit our NOC application for permitting us for using the surface water for our site camp construction and operation work.

We kindly request you to issue NOC and permit us to use the surface water for our site camp construction and operation works.

Thanking You

Your Faith Fully
For Andritz Hydro PVT LTD

17.11.2023

Site Manager
Andritz Hydro Pvt. Ltd.
Lower Kopili Hydro Project
Vill.-Longku, Dist. – Dima Hasao
State - Assam, Pin – 788931

Receive of
17/11/2023

ANDRITZ

No objection Certificate

To Whom so ever it may concern

The permission is here by Granted for Andritz hydro Pvt Ltd , CP-3 contactor of lower Kopili hydro power project, to use the surface water for their construction and operation of the site camp ,located near PR7, Longku village, Dima Hasao district, Assam State -788931.

I have no objection in issuing this certificate in favour of M/S Andritz hydro Pvt Ltd for using the Surface water for their site camp construction and operation works.

20.11.2023

Dilsabra
Dima Hasao

Annexure 22: MOM of the 2nd BMC meeting

Minutes of the 2nd Meeting of the Biodiversity Management Committee held on 21.06.2023 at 14.30 PM at Divisional Forest Office, Dima Hasao West Division, Haflong, Dima Hasao.

Following members were present.

Sl. No	Name	Designation	BMC
1	Mr Mridul Saikia	Project Director, LKHEP cum CGM, PP&I, APGCL	Chairman
2	Mr Akshay Talukder	GM, PP&I, APGCL	Member
3	Mr Tuhin Langthasa	Asst. Conservator of Forests, I/c, Dima Hasao West Division	Member
4	Mr Rajiv Engti	Asst. Conservator of Forests, I/C Hamren Division	Member
5	Dr Deepak Baruah	Environment Expert, APGCL	Member

At the onset Chairman of the Committee welcomed the members and explained the purpose of the meeting and requested to extend support for effective implementation of the Biodiversity Conservation Plan under the Environment Management Plan and compliance of the ADB's Safeguard Policy Statement, 2009.

A brief presentation was given on this aspect by PMC and APGCL covering all the measures to be taken and highlighted the prioritization of the action as per the need in a phase manner. APGCL emphasised that both the measures and recommendations of MoEF&CC and ADB to be considered during implementation within the stipulated budget from the state share.

It was decided that activity wise proposals from the Biodiversity Management Plan with the estimates and Action plan for the next 6 months (July to December 2023) to be submitted from the respective Forest Divisions soon.

Mr. Tuhin Langthasa discussed on the implementation of the CAT Plan and Soil and Moisture Conservation Plan with APGCL. He also explained the status of implementation of the Compensatory Afforestation Plan under his Division and requested APGCL to collect the Report and periodic UC from the CAMPA office, Guwahati as they have already submitted the status report to them.

Dima Hasao West Division will prepare the next six months proposal covering :

1. Awareness on conservation of wildlife and their habitats near the project area.
2. Annual Bird Count in winter
3. Legal training for the departmental staff either in Haflong or in Kaziranga.
4. Additional support for Camera Trapping (as the department is getting more information through the camera traps in the upstream of the LKHEP Dam site and camera trap photographs were shown to the members).
5. Construction of a Watch tower
6. Construction of Antipoaching camp

PPT is shared to all the members so that they can provide their views and suggestions for effective implementation of the Plan.

Chairman briefed about the modalities of the financial approval of the Biodiversity Management Plan form the State Government as follows. After getting the suggestions / proposals from the respective forest divisions within 15th July 2023; final plan of operation for the next six months will be formulated with the approval from the APGCL and will be forwarded for necessary budgetary approval from the state government.

The meeting ended with the vote of thanks from the chair.

(Mridul Saikia)
Chairman of the Biodiversity Committee of LKHEP cum
Project Director, LKHEP, APGCL

Annexure 23 : MOM of the 3rd BMC meeting

Minutes of the 3rd Meeting of the Biodiversity Management Committee held on 12.12.2023 at 14.30 PM at Divisional Forest Office, Dima Hasao West Division, Haflong, Dima Hasao.

Following members were present.

Sl. No	Name	Designation	BMC
1	Mr Mridul Saikia	Project Director, LKHEP cum CGM, PP&I, APGCL	Chairman
2	Mr Bikash Bharali	DGM, PP&I, APGCL	
3	Mr Tuhin Langthasa	Asst. Conservator of Forests, I/c, Dima Hasao West Division	Member
4	Mr Rajiv Engti (partially attended through VC)	Asst. Conservator of Forests, I/C Hamren Division	Member
5	Dr Deepak Baruah	Environment Expert, APGCL	Member
6	Dr Jayanta Das	Environment Specialist, PMC	
7	Mr. Sangram Singh	Social Safeguards and Resettlement Specialist, PMC	
8	Mr. Ranjit Das	FR, HQ	
9	Mr. Donmaidao Thousen	Range Officer, Garampani Range	

At the onset Chairman of the Committee welcomed the members and explained the purpose of the meeting and requested to extend support for effective implementation of the Biodiversity Conservation Plan under the Environment Management Plan and compliance of the ADB's Safeguard Policy Statement, 2009. Chairman also appraised that the AOP is received from the DFO office and for the implementation of the task in short-term and long-term manner which are to be set on the priority basis and for which prior financial approval from the Govt. of Assam is required to be obtained.

A brief presentation was given on implementation of BMP by PMC and APGCL covering all the measures to be taken and highlighted the prioritization of the action as per the need in a phase manner. After discussion the following immediate actions were recommended by the Committee.

1. Annual Bird Count – APGCL will extend support of Rs 100000.00 (Rs. One Lakh) for engaging one or two bird experts from the state of Assam to carryout the Annual Bird Count in the project impacted area. A report will be prepared for the year 2023. The study may be carried out for 3-4 days in the month of December, 2023 involving the Forest Department and local volunteers. Chairman sir enquired about any existing reports on bird counts are available or not for Dima Hasao. The DFO informed that one report on the Amur Falcon was prepared under the guidance of Dr Anwaruddin Choudhury and he will also refer that document in the proposed Annual Bird Count Report.
2. Awareness camp – One Biodiversity and conservation awareness camp will be carried out by the Forest Department in the month of December, 2023 covering the legal Provisions along with the Annual Bird Count. APGCL will support Rs 50000 (Rs Fifty Thousand) for the awareness camp. Detail estimate for Annual Bird Count and Awareness camp for this year will be prepared by the Forest Department and submitted to APGCKL by 18th December, 2023.
3. As informed DFO was not aware about the change in the submergence area of the project. APGCL explained that there is no change in the submergence area as that was in the EIA.

Environmental Monitoring Report

PUBLIC

Semestral Report: July 2023 – December 2023
December 2024

India: Assam Power Sector Investment Program - Tranche 3

Part 3 of 3: Annexure 23 (continued) and Annexure 24 - 26

Prepared by Assam Power Generation Corporation Limited (APGCL) for the Asian Development Bank (ADB).

Asian Development Bank

Moreover, all the changes made due to detail engineering design were intimated to the MoEF&CC and approval on the changes were sought from the Ministry. After deliberation in the EAC held on 26.10.2023, EAC recommended the changes with certain conditions. Minutes of the meeting was disclosed in the MoEF&CC site on 14.11.23. The copy of the minutes of the EAC meeting was shared with the DFO, Dima Hasao for reference. APGCL has also informed that Central Inland Fisheries Research Institute (CIFRI) has agreed to carry out detail Aquatic study specially, migratory aquatic species in the river Kopili in relation to the LKHEP. DFO also informed that Dr Sarbojit Thousen of Haflong College has done his PhD research on the fishes of the river Kopili and he may be consulted for the list of fishes. APGCL agreed to do so.

4. The DFO, Dima Hasao West Division requested APGCL for Joint survey with the Revenue Department, APGCL and Contractor to mark the trees along the ROW of 35 meters of the 220 KV Transmission line traversing through Dima Hasao for pruning or cutting. For that letter has already been issued from DFO office to GM, APGCL, Longku. APGCL will initiate the joint ROW survey soon.
5. DFO was requested to prepare a detail estimate for Construction of a watch tower near the reservoir to strengthen patrolling in the area. A sample photograph of the watch tower is attached herewith in annexure 1 for preparation of estimate.
6. The DFO has also requested APGCL to instruct L&T to reconcile the minor minerals use and royalty paid for the period October and November 2023 as early as possible.
7. APGCL will submit a letter to DFO, Dima Hasao to allow APGCL to install automatic G&D station on the riverbank (3 m X 3 m) in the upstream of the LKHEP dam. This station will be part of the early warning system for the down stream districts of the river Kopili. DFO assures to provide necessary permission in a shortest possible time.
8. Requirement of Elephant Ford as per the EIA (ADB) was discussed and it was confirmed that no such Fords has been prepared on any natural stream in Assam for the conservation of Asian Elephants. Range Officer of Garampani Range confirmed that there is a resident population of 35-40 elephant in the upstream of the LKHEP submergence area.
9. In response to the request from APGCL for providing the list of indigenous and important species of the area, DFO informed that they will prepare the working plan of the district shortly and meanwhile they will also provide the list so that APGCL can consider those species for future plantation in the area through the contractors.

The meeting ended with the vote of thanks from the chair.

(Mridul Saikia)
Chairman of the Biodiversity Committee of LKHEP cum
Project Director, LKHEP, APGCL

Annexure 1

Annexure 24 : Attendance sheet of the Awareness meetings CP-2

120 MW LOWER KOPILI HEP Date: 25/08/23			
Critically Endangered Species Awareness Training Attendance sheet			
NAME	LOCATION	SIGNATURE	REMARK
[illegible]			
[illegible]			
SACHIN KUMAR		Sachin Kumar	
Md. Sabdh Ali		[illegible]	
Nandlal Ram		Ram	
Shamsher Nath Singh		S. N. S	
POPPU Ali		Poppu ali	
MDSAYIM		MDSAYIM	
[illegible]		[illegible]	
Durgesh Pandey		[illegible]	
		Pandey	
Ramyash Prasad		Ramyash	
Mrityunjay Barman		Mrityunjay Barman	
Dharmendra Singh		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	
[illegible]		[illegible]	
Ranjan Tason		Ranjan Dason	
Semsonsing Engti		[illegible]	
Munna chauhan		[illegible]	
Dilen Ronghang		[illegible]	
[illegible]		[illegible]	
Abhishek Singh		[illegible]	
Md. Sahid mallick		Md. Sahid mallik	
[illegible]			
Nizam Uddin Saha		Saha	
Dhoram Singh		[illegible]	

Mitosh Das S/c Supervision

120 MW LOWER KOPILI HEP		Date- 09/09/23	
General Environmental Awareness Training Attendance sheet			
NAME	LOCATION	SIGNATURE	REMARK
[illegible]			
Nadalal Ram		[illegible]	
SACHIN KUMAR		Sachin Kumar	
Md. Sabdu Ali		Sali	
Shambhu nath singh		S. N. S.	
[illegible]		[illegible]	
Pappu ali		Pappu ali	
MDSAYIM		MDSAYIM	
[illegible]		[illegible]	
Durgesh Pandey		Pandey	
Ram yash Prasad		[illegible]	
Moitgunraj Barman		Moitgunraj Barman	
Dharmendra Singh		[illegible]	
अमर मिश्रा		अमर मिश्रा	
इन्द्रजीत कुमार		इन्द्रजीत कुमार	
सागर शर्मा		सागर शर्मा	
Ranjan Doran		Ranjan Doran	
Remson Singh Engti		[illegible]	
Murad Shoukat		[illegible]	
Jilen Ronghang		[illegible]	
[illegible]		[illegible]	
Abhishek kr singh		[illegible]	
Md. Sahid Mallick		Md. Sahid Mallick	
[illegible]		[illegible]	
Niranjan Saha		[illegible]	
Dharam Singh		[illegible]	
Promod Kr Dom		[illegible]	

Mithu Das S/C Supervision

120 MW LOWER KOPILI HDYRO ELCTRIC PROJECT, PKG-2, ASSAM **Date:** 15/12/23

Critically Endangered Species Awareness Training Attendance sheet

S.NO.	NAME	LOCATION	SIGNATURE	REMARK
1	Dharmeswar Goyary	office	[illegible]	
2	Bablu Sinha	"	B. Sin	
3	Kersing Deru	"	Korsing	
4	Sarthe Teron	"	S. Teron	
5	Long Singting	"	L. Ting	
6	Menking Ronghang	"	M Ronghang	
7	Rabi Borman	"		
8	Lakhinder Singh.	"	L singh.	
9	Dilip TERON	"	Dilip	
10	Nukesh Kishan	"	[illegible]	
11	ROMIO MANDAL	EIIS OFFICE	R Mandal	
12	Sunil Basumatary	"	Sunil Basumatary	
13	[illegible]	"	[illegible]	
14	Mukesh Kumar	"	Mukesh Kumar	
15	Pradip Rongpi	"	Pradip Rongpi	
	Jelon Ronghang		[illegible]	
	Nibdh Dutt		[illegible]	
	T. Gouri Shankar		[illegible]	
	SUKHEN		[illegible]	
	Sarangepani Bora	"	Bora	

Annexure 25 : Scope of the down stream and back water study by the College of Fisheries, Raha.

Terms of reference of Aquatic Ecologist for Downstream and Back water Impact Assessment for Lower Kopili Hydro Electric Project (LKHEP), 120 MW in Karbi Anglong and Dima Hasao districts of Assam.

Background :

Down stream impact study, back water assessment and sedimentation rate assessment were carried out for LKHEP during EIA study by WAPCOS in the year 2014-2015complying the TOR issued by MoEF&CC. As there were some gaps in the detail understanding of the impact assessment hence, APGCL will again carryout detail assessment of the down stream and backwater impact assessment by engaging experts before reservoir filling.

LKHEP :

Construction of the 66.5 m concrete gravity dam will lead to the formation of a reservoir up to 6km upstream in the Kopili River. LKHEP is down stream development of Kopili HEP 270 MW in Umrong dam (50 MW X 4 nos) and Khandong Dam. (25 MW X 3 nos) The passage of flow through a reservoir will lead to the reduction in peak flow. The lean season flow in the river too will be regulated. The 5.65 km long river stretch downstream of the dam site up to the confluence point of tail race discharge and about 8.26 km stretch further downstream (from tail race discharge to confluence point of river Mynriang river) will have reduced flow. However, less flow in this river stretch may impact the riverine ecology, in as much as it has some ecological value despite the acidic nature and lack of fish.

A. Scope of the Back Water effect assessment

1. Sediment data from DPR,
2. Topography (DEM) of reservoir, (will be provided by RMSI and Drone based survey)
3. Fluctuations in reservoir. (PMC / APGCL will provide information on the 10 daily inflow, details will be provided after installation of D/G upstream by RMSI)
4. Fluctuations induced sediment deposition. (From DPR and discussion with NEEPCO by APGCL/ PMC)
5. Free board calculations. (PMC / APGCL will provide the information)
6. Changing of volume in the reservoir. (PMC / APGCL will provide the information)
7. Frequent and higher valley- floor inundation. (Data will be provided by RMSI)
8. Eutrophication assessment to be carried out, (Baseline was assessed based on water quality interpretation by WQ expert and provide probable assessments and measures provided by EMC. (Also to be updated based on sediment data)
9. Data from the DPR reg. variation in water level, how total volume of water would change- required for the modelling of D/S. (PMC / APGCL will provide the information)
10. Impacts of backwater effects viz. fluctuations induce sediment deposition, frequent and higher valley-floor inundation, increased groundwater level, change in upstream channel morphology and riparian vegetation, aquatic ecology etc;
    a. Change in upstream channel morphology. (RMSI was of the opinion that it is not going to be significant change. DPR geological investigation report also provided information on the rim geology / slope stability.)
    b. Change in groundwater level. (As data is not available with CGWA, trend analysis will be provided by APGCL / PMC from the other Govt sources)
11. Preparation of Reservoir Rim Management Plan- Reservoir Rim Treatment Plan for stabilization of land slide/land slip zones if any, around the reservoir periphery to be prepared. Suitable engineering and biological measures for treatment of the identified slip zones to be provided with physical and financial schedule. (~~PMC~~ / APGCL will provide the information)
12. Multilayer tree plantation plan to be developed as per EC and Fc stipulation in consultation with the Forest department and APGCL.

The study should cover : the entire reservoir spread area and submergence area.

B. Scope of the Down Stream Impact Study

Downstream impact on water, land & human environment due to drying up of the river in the stretch between dam site and powerhouse site and beyond. The study is to inform operational protocols and minimize the environmental impact of a sudden ramping up and down in flows which was not specifically addressed in the June EIA, 2018.

The study should cover the following domains :

To know the present status of environment in the area, data with respect to environmental components air, water, noise, soil, land and biology and biodiversity (flora and fauna), wildlife, water dependency status etc, should be collected with 10 km radius of the project components.

- The study area should comprise of the following :
    - 5.65 km long river stretch downstream of the dam site up to the confluence point of tail race discharge and the river.
    - about 8.26 km stretch further downstream (from tail race discharge to confluence point of river Mynriang river)
    - Down stream area to be decided by the experts after their review of the entire down stream of the river Kopili till the confluence point with the river Brahmaputra in consultation with RMSI, PMC, APGCL and the available information on the diurnal fluctuations of the river during operation.
- Details of the project and site giving L-sections of all D/S projects of the River with all relevant maps and figures. Connect such information as to establish the total length of interference of Natural River, the total length of tunnelling of the river and the committed unrestricted release from the site of diversion into the main river. Hydrological studies / data as approved by CWC shall be considered for verification of the present status. As sufficient data is not available fresh cross section data were taken by RMSI. (Detail information on the cross-sections are available with APGCL / RMSI)
- Different riverine habitat like rapids, pools, side pools and variations in the river substratum – bedrocks, rocks, boulders, sand / silt or clay, etc, need to be covered under the study.
- Hydro- Metrology of the project viz, Precipitation (Rainfall), Temperature, Relative humidity. (Data available with RMSI)
- The surface and ground water quality to be monitored at such locations that are environmentally and ecologically more sensitive in the study area along with ambient Air quality and noise level.
- Run off, discharge and velocity data during the study period from the G&D monitoring station and collection of secondary data for the last 16 years. Flow series, 10 daily with 90%, 75% and 50% dependable years discharge available. Hourly flow data will be available from December, 2023.
- Information on 10 -daily flow basis for the 90% dependable year the flow intercepted at the dam, the flow diverted to the power house and the spill comprising the environmental flow and additional flow towards downstream of the dam for the project may be given. (Information be collected from PMC / RMSI/APGCL)
- Down stream Basin characteristics of the river kopili also to be assessed. River Morphology is available with RMSI but ecological characteristics to be assessed.
- Downstream impacts on ecological services, sediment fluctuations, nutrient levels, benthic layer, eutrophication, photosynthesis, surface and ground water hydrology, riparian morphology, bank erosion, terrestrial ecology (along banks), aquatic temperature and dissolved oxygen fluctuations etc., areas of inundation, community livelihood, analysis of available evacuation time for community at downstream in different flood scenario, flood

warning system, confirmation of operational protocol that will ensure "not net loss" of downstream biodiversity etc. Highlighted information are available.

- In doing upstream and downstream assessment peaking power shall be factored. Analysis will be done by RMSI but inputs required from Ecological modelling.
- Optimum reservoir operation plan shall be prepared to minimize backwater effects and downstream impacts;
- Develop adaptive resource management (ARM) strategies to optimize system performance by monitoring to verify predicted project impacts and modifying operations as needed to avoid unacceptable impacts. During preparation inputs will also be required from EMC, RMSI, PMC, APGCL.
- Community emergency and evacuation plan for construction and operations period etc. Will be prepared by RMSI.
- Study on socio economic impacts along with issues of safety of the people and their livestock in downstream of the river. Partly covered by RMSI.
- Provide lateral river-flood zone movement connectivity through the physical modification of the river bed, the creation of downstream wetlands and shallow areas, and through intentional flood or nonregular ecological flow releases. RMSI can support as per the inputs provided by the Ecologist from the model.
    - RMSI will provide plan for lateral river- flood zone movement connectivity through the physical modification of the river bed.
    - The creation of downstream wetlands and shallow areas, and through intentional flood or nonregular ecological flow releases plan will be provided by RMSI.
- Assessment of hydrology and hydraulics (e.g. flow rates and water levels), and social and economic issues (including different water uses and public safety). Mostly under the scope of RMSI.
- Impacts of Silt Management operations. As per DPR as no additional studies ar carried out.
    - RMSI has capacity to provide this if sediment release from dam and dam operation is provided to RMSI. RMSI can deliver it by developing a sediment transport model of the reservoir and downstream through an additional scope of work.
- Assessment of Groundwater Depletion in Downstream areas. (As data is not available with CGWA, trend analysis will be provided by APGCL / PMC from the other Govt sources)
- Hydropower projects will alter downstream flow and sediment volumes, timing, predictability, and flow change rates, which, together with temperature, water clarity, and other water quality changes
- Prepare a comprehensive water use plan that manages the extent and timing of drawdown to minimize adverse ecosystem and ecosystem services impacts without significantly compromising hydropower generation operations
- Develop a long-term, aquatic, multi-taxa, biodiversity evaluation and monitoring program that includes the benthic, in-stream and riparian habitats. Baseline data should be collected prior to project-related impacts and monitoring should continue as part of an adaptive management program
    - Collection of Baseline data should be collected prior to project-related impacts. Carried out by EMC.
    - Area to be covered to be finalized for downstream and upstream biodiversity assessment. Will be under the scope of EMC in consultation with Aquatic ecologist.

- Develop a long-term, aquatic, multi-taxa, biodiversity evaluation and monitoring program that includes the benthic, in-stream and riparian habitats. Will be under the scope of EMC in consultation with Aquatic ecologist.

- Quantify losses and predict gains in fish populations when required to demonstrate No Net Loss or Net Gains of biodiversity
- Sampling and documentation of Aquatic fauna like macro-invertebrates, zooplankton, phytoplanktons, benthos, etc to be covered in this study.
- Fish and fisheries their migration if any and breeding grounds to be recored and compared with EIA study.
- Sampling for evaluation of fish diversity composition and maximum length and weidth of the measured populations.
- Conservation status of the aquatic fauna to be considered and recommendations to be furnished.
- Human dependency on downstream river water to be studied. Partly covered under the scope of RMSI.
- Reporting with Maps, Sampling points, supportive photographic evidences also to be considered.

Before initiation of the study detail methodology to be submitted to APGCL and recommended guidelines to be considered for the study.

STUDY OF ALTERED WATER QUALITY AS A DRIVER OF ECOLOGICAL IMPACTS IN THE DOWN STREAM OF THE KOPILI RIVER BASIN

1. CONDUCTIVITY
2. BOD
3. COD
4. DISSOLVED OXYGEN,
5. TEMPERATURE (T)
6. TOTAL SUSPENDED SOLIDS (TSS)
7. PHYTOPLANKTON
8. ZOOPLANKTON
9. AQUATIC INSECT DIVERSITY
10. MACROBENTHOS & MACRO INVERTEBRATES
11. FISH DIVERSITY
12. EVALUATION OF THERMAL STRATIFICATION.
13. HARDNESS
14. CHLORIDE
15. CALCIUM
16. MAGNESIUM
17. NPK (Analysis of the nutrient contents - nitrogen and phosphate)
18. SOIL HARDNESS/WATER HARDNESS
19. SOIL NITROGEN
20. MICROBIAL ESTIMATION FOR WATER QAULITY
21. MACROBENTHOS/MACROINVERTEBRETES

Study Methodology: Describe in detail the methodologies that will be used to conduct the ecological study, including but not limited to:

• Field data collection methods, such as sampling techniques, monitoring protocols, and data analysis.

• Laboratory analyses, including water quality analyses, habitat assessments, and vegetation surveys.

• Remote sensing and GIS analyses, if applicable. (Already done by RMSI)

• Literature review and synthesis of existing ecological data and reports.

• Stakeholder engagement and consultation processes, including engagement with local communities, indigenous peoples, and relevant government agencies.

Note : River model, Hydrological models in HECRAS, DTMs of the area, inundation maps etc will be provided by RMSI. APGCL / PMC will provide the Draft Reservoir Operation manual. Rest analysis through software like MIKE hydro / MIKE River/Delf 3D to be used.

Duration of the study :

The study should be completed within 90 days and accordingly reports to be submitted. Final Report to be submitted by 31st March 2024.

Data Analysis and Interpretation: Outline the procedures for data analysis and interpretation, including statistical analyses, spatial analyses, and qualitative data analysis. Clearly specify the criteria and standards that will be used to evaluate the impacts of the hydro power project on the ecological components, and the criteria for determining the effectiveness of proposed mitigation measures.

Reporting: Provide a detailed plan for reporting the results of the ecological study, including the format, content, and timeline for the submission of interim and final reports. Specify the intended audience(s) for the reports and any additional deliverables, such as presentations, posters, or technical briefs.

Budget and Resources: Provide a comprehensive budget for the ecological study, including all costs associated with field data collection, laboratory analyses, data analysis, reporting, and any other relevant expenses. Specify the resources that will be allocated for the study, including personnel, equipment, and facilities.

Timelines: Provide a detailed timeline for the completion of the ecological study, including milestones, deadlines, and key activities. Clearly specify any time-sensitive aspects of the study, such as seasonal constraints or permitting requirements.

Ethics and Health & Safety: Clearly state the ethical considerations that will be followed during the ecological study, including adherence to relevant laws, regulations, and guidelines for research involving human subjects, animal subjects, and/or sensitive ecological components. Describe the health and safety measures that will be implemented to protect the well-being of the study team and any participants involved in the study.


vivo Y72

Reference No: FIPL/ED/APGCL/Semi Annual Summary-2/Oct/01

October 2024

External Semi-annual Monitoring Validation Report for Environmental Safeguards Implementation from July to December 2023 120 MW Lower Kopili Hydroelectric Project

Submitted to
Assam Power Generation Corporation Limited

Annexure 26

Submitted by
Feedback Infra Private Limited ENERGY DIVISION
AQUALOGUS – Engenharia e Ambiente, Lda
Jade Consult Pvt. Ltd.

List of Abbreviations	
ADB	Asian Development Bank
APGCL	Assam Power Generation Corporation Limited
APO	Assistant Personnel Officer
APSIP	Assam Power Sector Investment Program
CAP	Corrective action plan
CATP	Catchment Area Treatment Plan
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CEMP	Contractor Environmental Management Plan
CGWB	Central Ground Water Board
CTE	Consents to establish
CTO	Consents to operate
DC	Double Circuit
EA	Executing Agency
EAC	Expert Appraisal Committee
EC	Environment Clearance
EDS	Essential Details Sought
EHS	Environment Health and Safety
EIA	Environment Impact Assessment
EMC	External Monitoring Consultant
EMP	Environmental Management plan
FC	Forest Clearance
FIPL	Feedback Infra Private limited
GOI	Government of India
GOA	Government of Assam
GRM	Grievance Redress Mechanism
IWRMP	Integrated Water Resources Management Plan
L&T	Larsen & Toubro
LKHEP	Lower Kopili Hydroelectric Project
MOC	Memorandum of Change
MoEF & CC	Ministry of environment Forest and Climate Change
MPR	Monthly Progress Reports
MSL	Mean Sea Level
NCHAC	North Cachar Hills Autonomous Council
NOC	No Objection Certificate
NGO	Non-Governmental Organisation
PESO	Petroleum and Explosives Safety Organization
PMC	Project Management Contractor
PMU	Project Management Unit
SEMR	Six-Monthly Environment Monitoring report
SRC	Sulphate Resistant Cement

SPS 2009	Safeguard Policy Statement
VLCC	Village Land Management and Conservation Committee
WQRP	Water Quality Restoration Plan

Contents

1.0 PROJECT BACKGROUND

1. Assam Power Generation Corporation Limited (APGCL), is in the process of building a 120 MW Lower Kopili Hydroelectric Project. The Lower Kopili H.E. Project (LKHEP or "project") involves the construction of 120 MW hydroelectric power plants and an associated 50 km long 220 kV transmission line in Karbi Anglong and Dima Hasao Districts in the north-eastern State of Assam, India. The project will use the hydropower potential of the Kopili River, a south bank tributary of the Brahmaputra River, at Longku, utilising the regulated discharge from Kopili HEP, spills from Khandong and Umrong Dams in the upstream, and the discharge from the intermediate catchment. The project is designed to operate as a run-of-river power plant with diurnal storage with a total capacity of 120 megawatts (MW), comprising a main plant rated at 110 MW (2X55 MW) and an auxiliary plant rated at 10 MW (1x5 MW+2x2.5 MW) at the toe of the dam for utilising the mandatory releases for ecological purposes. The scheme has been contemplated to run at full potential in the monsoon season and operate as a peaking station in the non-monsoon season.

2. APGCL, through the Government of Assam (GoA) and subsequently through the Government of India (GOI), has applied for a loan from the Asian Development Bank (ADB) towards the cost of LKHEP under the Assam Power Sector Investment Programme (APSIP) in Environment Tranche 3.

3. The project has been accorded environmental clearance by MoEF&CC on September 4, 2019, as it falls under **Category 'A'** of the Environmental Impact Assessment (EIA) Notification, dated September 14, 2006 (and amendments thereafter). The project has also received stage 1 and stage 2 forest clearance from MoEF&CC on February 5, 2019, and December 4, 2020, respectively, as a result of the project's requirement to divert forest land.

1.1 PROJECT SALIENT FEATURES

4. The proposed dam will be a concrete gravity dam with a top longitudinal cross section of 335 m and a height of 66.5 m. The crest of the dam will be 229 m above mean sea level (MSL). The dam will create a reservoir at Longku with a spread of 620 hectares (ha) and live storage of 77 million cubic metres. The designed discharge capacity is 112.71 cubic metres per second (m/s) at a flow velocity of 3.86 m/s and 5.31 m/s. Within the Project Site Area of LKHEP, 14 new Access Roads are included for access to various Project Components. The Civil work and electromechanical work are in progress. The project's salient features are given in **Table 1.1**.

Table 1.1: Project Salient Features

Particulars	Description	
Name of the Project	Lower Kopili Hydroelectric Project	
State	Assam	
District	East of Karbi Anglong and West of Dima Hasao (North Cachar) Hills District (Project Location Map is attached as **Annexure-I**)	
River	Kopili	
Catchment area	2,076.62 sq. km	
Environmental flow (e-flow)	Minimum 5.345 m^3/s	
DAM		
Dam Type	Concrete Gravity Dam	
Maximum height of the dam	65.50 m	
Overflow spillway for debris removal size (W x H)	4.0 m x 3.0 m	
Sluice spillway No. & size (W x H)	6 Nos., 10 m x 12.50 m	
Sluice spillway capacity	11,030 m^3/s	
Gate type and Number	Radial gate and 6 No. with hydraulic hoist	
RIVER DIVERSION		
Diversion type	Coffer dams, Diversion Tunnel of 10.5 m diameter at right bank	
Upstream Coffer dam		
Type	Plum Concrete	
Height	21.50 m	
Top Length and Level	179.5 m, EL. 193.0 m	
Downstream Coffer dam		
Type	Earth & Rockfill	
Height	10.0 m	
Top Length and Level	132.0 m, EL.181.0 m	
INTAKE	**MAIN POWERHOUSE**	**AUXILIARY POWERHOUSE**
Number of openings	1	1
Nominal discharge	112.71 m^3/s	24.94 m^3/s (e-flow of 5.345 m^3/s within this)
HEAD RACE TUNNEL		
Location	Right bank of Kopili river	
Length	3,641.60 m	
Nominal discharge	112.71 m^3/s	

ADIT-1 TO HRT		
Shape and Size	D-Shape, 6.0 m	
Length	354.66 m	
Type & Number of Gate	Hinge type, One	
Gate Size (W x H)	2.5 m x 2.5 m	
SURGE SHAFT		
Type	Restricted orifice type	
Diameter	25 m	
VALVE HOUSE		
Type & Number	Surface	
Size (L x W x H)	23 m x 14 m x 27.50 m	
PRESSURE SHAFT	**MAIN POWERHOUSE**	**AUXILIARY POWERHOUSE**
Type	Circular steel lined	Circular steel lined
Nominal discharge	112.71 m^3/s	24.94 m^3/s
Length of pressure shaft Length of Surface Penstock	610m (Dia 6.1m)/ 81.9 m (Dia 5.2m)	64 m
Number of pressure shaft	1	1
Specification of steel plates	ASTM A537	ASTM A537
Penstock	2	3
Internal diameter	3.70 m	2 Nos.1.65 m & 1 No.2.35 m
Length	16.3 m	26.20 m/ 26.20 m/ 24.20 m
POWERHOUSE	**MAIN POWERHOUSE**	**AUXILIARY POWERHOUSE**
Installed capacity	2x55 MW=110 MW	2x2.5 MW+1x5 MW=10 MW
Location	Right side of river Kopili	Right side of river Kopili
Type	Surface powerhouse	Surface powerhouse
Powerhouse dimensions (L x W x H)	76.5 m x 19.1 m x 30 m	50.5 m x 10 m x 27 m
Average gross head	114 m	48.30 m
Type of turbines	Francis, vertical	Francis, horizontal
Number of units	2	3
Installed capacity per unit	55 MW	2.5 MW / 5 MW
TRANSFORMER YARD		
Type	1 phase, ONAN/ONAF	3 phase, ONAN/ONAF cooled Generator Transformer

Location	Upstream of powerhouse	Upstream of powerhouse
Number	7 (6+1 spare) nos.	2 nos.
Rated capacity	24 MVA	6.5 MVA
TAIL RACE CHANNEL		
Type	Rectangular Channel	Rectangular Duct
Numbers	1	Three separate ducts merging into one common duct
Size (L x W)	208.4 m x 26 m	43.40m for 5 MW unit 29.65m for 2.5 MW Units
SWITCH YARD		
Type & Size	Outdoor-146 m x 72 m	Outdoor-24 m x 21 m
Voltage level	220 kV	33 kV
CONSTRUCTION PERIOD		
Total construction period	4 Years	

5. In addition to the dam and its structures, an officer's colony is being established with adequate facilities for the treatment of wastewater generated from the colony.

6. The power evacuation system includes the construction of a 220 kV Double Circuit (DC) transmission line (TL) from the Main Powerhouse (MPH) site of LKHEP to an existing 132/33 kV Substation (S/S) at Sankardev Nagar (Lanka) and the construction of a 33 kV Single Circuit (SC) Transmission Line (TL) from the Auxiliary Powerhouse (APH) site of LKHEP to an existing 132/33 kV S/S at Umrangsu. The length of TL between the MPH and Sankardev Nagar is 46.013 km, and between the APH and Umrangsu it is 22 km. The power evacuation system will also involve upgrading an existing132/33 kV S/S at Sankardev Nagar with the existing 2 power transformers of capacity 2x25 MVA to 220kV with 2 interconnected transformers (ICT) of capacity 2x160 MVA. The relevant switchgear type proposed is a gas-insulated substation (GIS).

7. As per ADB's Safeguard Policy Statement (SPS 2009), the Project is classified as **Category 'A'**.

1.2 PROJECT PROGRESS STATUS

8. The project is segmented into four packages, and their selection and work progress are detailed in Table 1.2 below. Notably, during the current reporting period, the progress of most packages has shown improvement, with the most significant incremental advancement observed in Package 3 (Electromechanical Works):

Table 1.2: Project Progress Status in the period Jul-Dec 2023

S.N.	Contract Packages	Nature of Work	Date of Award	Name of Contractor	Physical Progress (Jan-June 23)	Physical Progress (July-Dec 23)
1	CP-1	Establishing Housing colony for APGCL officers	30.09.2022	BVG India Ltd.	11%	34.03%
2	CP-2	Civil and Hydro mechanical works for the Dam and ancillary structures	21.08.2020	L&T	47.1%	58.35%
3	CP-3	Electromechanical Works	09.09.2021	Andritz Hydro (P) Ltd.	24%	55%
4	CP-4	Transmission Lines	20.04.2022	M/s. Salasar Techno Engineering Limited JV with M/s. Akelik Group	49.4%	69%

1.3 MONITORING REQUIREMENT

9. The proposed project is a '**Category A**' project under the ADB Environmental Safeguard Project categorization (ADB SPS, 2009). Accordingly, an Environmental Impact Assessment (EIA) was carried out by APGCL. In the EIA report, applicable laws and legislation and the policy framework have been reviewed, and environmental mitigation measures have been recommended for implementation during the construction and operation stages of the project and its associated facilities. Accordingly, a comprehensive Environmental Management Plan (EMP) and Environmental Monitoring Plan (EMoP) were provided, along with guidelines for a detailed construction method statement to be prepared by the contractor (and subcontractors). Also, a Biodiversity Management Plan (BMP) under the EMP has been formulated and is part of the package of activities designed to meet the requirements of ADB's Safeguards Policy Statement (SPS) 2009.

1.4 SCOPE OF WORK, VALIDATION OF SEMR BY EXTERNAL MONITORING CONSULTANT:

10. An External Monitoring Consultant (EMC) has been engaged under the project to provide technical guidance and monitor the implementation and effectiveness of Environmental and Social (E&S) Safeguards activities as per the requirements of national regulatory requirements and ADB's SPS 2009 safeguards requirements with respect to project construction activities. External Monitoring Consultant are required to verify the status of mitigation and monitoring activities for the project, with overall supervision of the implementation of:

- ✓ Compliance conditions stipulated under various clearances, permits, and NOCs obtained for the project.
- ✓ Environmental safeguard requirements as given in the ADB SPS 2009
- ✓ Compliance with loan covenants related to Environmental Safeguards
- ✓ Independent monitoring of the implementation of the Environmental Management Plan by the Construction Contractors

11. EMC has already validated the Six-Monthly Environmental Monitoring report (SEMR) for the periods July–December 2021, January–June 2022, July–December 2023 and January–June 2023. In addition, regular site visits are being conducted, and site visits and monthly and quarterly reports are submitted to APGCL. The SEMR verification report for the period July–December 2023 was submitted to APGCL on 29.04.24. The current report is the SEMR Validation Report covering the period from July 2023 to December 2023, based on the Semi-Annual Report of APGCL January, 2024 and revision of the same in the moth of July 24. The verification and validation studies were carried out employing the following approach:

- ✓ Desktop-based review of documentation and literature such as previous Monthly and Quarterly Progress reports for the project, Six-month Environmental Monitoring Reports, other records, and plans.
- ✓ Site inspections of different construction sites, labour camps and the staff accommodation areas, upstream and downstream of the dam in the months of July 23, Sept 23, Oct-Nov 23 and Dec 23.
- ✓ Interaction with project staff, the contractor's EHS team, the local community, and other stakeholders where needed.
- ✓ Validation and verification of compliance status of various permissions (CTEs, CTOs, groundwater abstraction permissions, tree cutting permissions, etc.)
- ✓ Validation, verification, and compliance status of ADB's loan covenants
- ✓ Validation and verification of the compliance status of EMP implementation measures

2.0 IMPLEMENTATION OF THE ENVIRONMENTAL SAFEGUARDS

Implementation Arrangement:

12. As the project's Executing Agency (EA), APGCL is responsible for carrying out all environmental protection measures. APGCL has a fully operational Project Management Unit (PMU) and a dedicated Social and Environmental Safeguards Cell (SESC), both of which are overseen by a Project Director (PD). The SESC coordinates overall environmental safeguards activities for the project, including the implementation of environmental and social safeguards plans and compliance monitoring. The SESC has one qualified environment expert and one qualified social expert, both on a contract basis. There was no change in staffing during the reporting period. As indicated in previous SEMR validation, it is suggested that SESC appoint a dedicated biodiversity or ecology expert and an Environment, Health, and Safety (EHS) professional for the project. As of this date, it is communicated that there is no qualified Environment, Health, and Safety (EHS) official appointed for the project; however, one site engineer has been designated

as having additional responsibility for EHS compliance for the project. There was no change in staffing during the reporting period.

13. The APGCL is supported by the Project Management Consultant (PMC) that was awarded to AF Consultant. The safeguard team of PMC comprised of a qualified Environmental Expert, One Social Safeguard Expert and also supported by one EHS expert.

14. During the assessment period, EMC also had interactions with the personnel of the contractors for Packages 1, 2, 3, and 4 and noted that:
    - ✓ The Package 1 contractor had an EHS expert on site; however, there was no environment expert on site.
    - ✓ The Package 2 contractor has appointed a qualified environment expert, a cluster EHS head followed by an EHS manager, and trained EHS field staff. They are responsible for preparing Monthly Review reports and Monthly Safety Reports and submitting them to APGCL.
    - ✓ Package 3 contactors also has appointed a qualified environment expert and an EHS expert.
    - ✓ The Package 4 contractor had an EHS expert on site; however, there was no environment expert on site.

15. An organogram showing the relationships and staffing for environmental and social protections between the executing and implementing agencies, the project management consultant, contractors, and the external monitoring consultant is presented below:

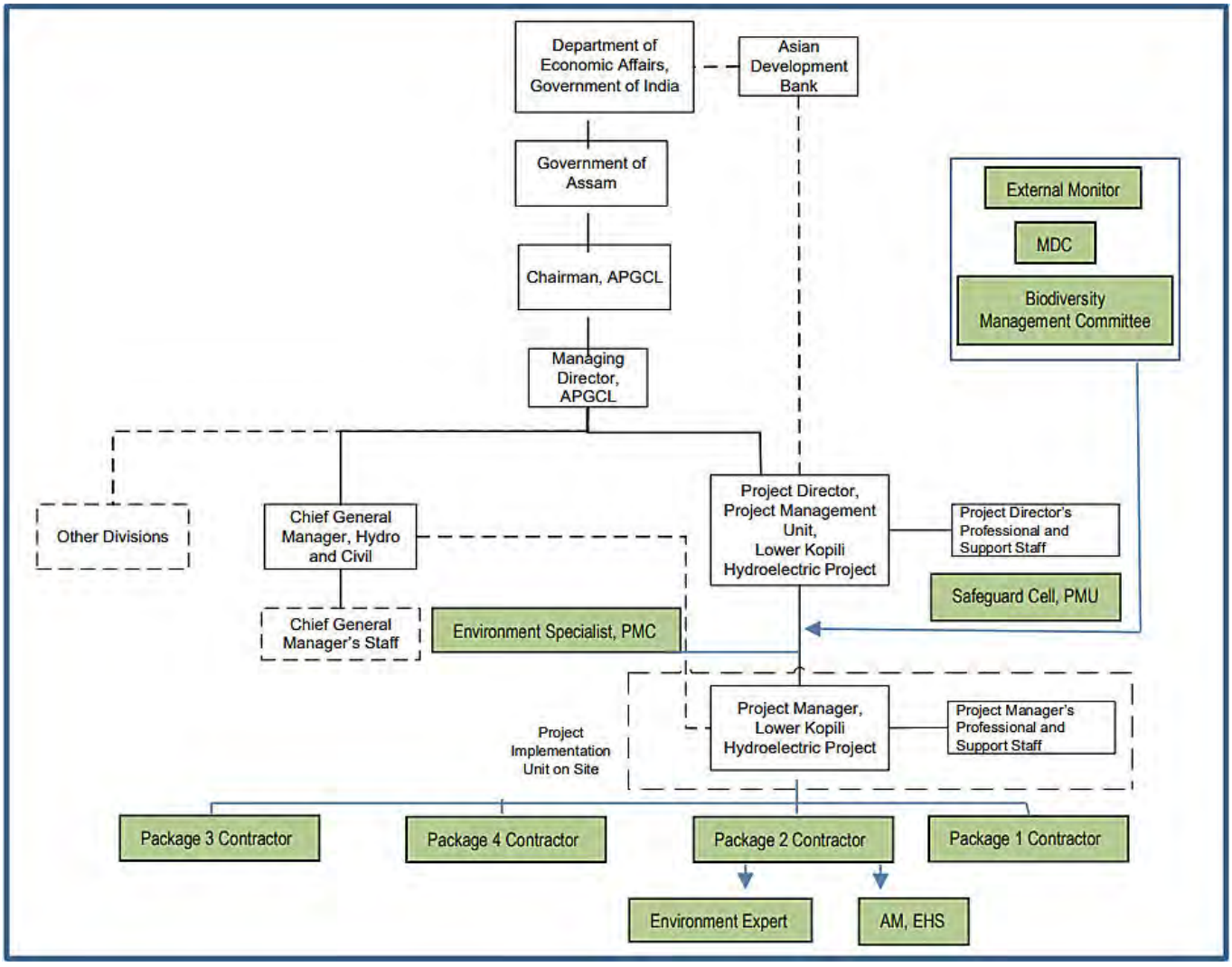


Figure 1: Organogram for implementation of Environmental and Social Safeguard for the LKHEP (120 MW)

Assessment of prerequisite for EMP implementation:

16. To assess the readiness of EMP implementation, the External Monitoring Consultant first determined if the APGCL was prepared to proceed with the construction of the proposed project and transmission line. The indicators used for the assessment are listed in **Table 2.1** below:

Table 2.1: EMP Readiness Assessment

Indicator	Assessment Criteria	Compliance	Remarks
EIA approval and disclosure	The EIA was cleared by ADB and disclosed on ADB's project website	Complied	

Indicator	Assessment Criteria	Compliance	Remarks
Mitigation measures described in the EMP adopted during detailed design and construction of the project	Measures defined in EIA and EMP are included in detailed designs for each project component.	Complied	EMP and the EMoP have been included as part of the contract documents with all contractors involved.
EIA/EMP update	Whether the EIA/EMP is updated after detailed design and cleared by ADB.	Being Complied	An update EIA and EMP is needed and is under preparation
Compliance with loan covenants	The borrower complies with loan covenants related to project design and environmental management planning.	Being Complied	Detail provided in section 2.3.
Environmental Monitoring	The monitoring parameters, locations, and methods for the ambient air, noise and surface water defined in the EMoP.	Being Complied	This is a continuous process and has been taken up by APGCL in the reporting period.

2.1 ENVIRONMENTAL COMPLIANCE STATUS

17. The compliance status of the project's implementation has two aspects:
    - Compliance status with National/State/Local statutory environmental requirements
    - Compliance status with ADB's loan covenants affecting environmental parameters.

18. Checking the status of compliance serves the objective of confirming and validating any deviations from loan covenant conditions and project-specific environmental law requirements. If there are any deviations, the APGCL must be consulted before proposing any corrective measures.

2.2 COMPLIANCE WITH NATIONAL/LOCAL STATUTORY REQUIREMENT

19. The SEMR have rightly presented the availability and pending status of all the necessary statutory consent, approval, permit, and clearance during the period July 2023 to December 2023.
20. The project has received the following clearances and permissions:
    - ✓ Environment Clearance was accorded to the project on 4th September 2019.
    - ✓ Stage-I Forest clearance received on 5th February 2019 and Stage-II on 4th December 2020

- ✓ Permission for extraction of boulders from quarry (Location: Longku, Dima Hasao), stage-I clearance received from North Cachar Hills Autonomous Council (NCHAC) on 8th July 2022; Stage 2 from Department of Geology and Mining Department Govt. of Assam (GoA) on 11th May 2022 and DFO (Dima-Hasao) gave order to RO to realize Royalty from Hi-Tech Rock Products and Aggregates Limited for 3,36,000 cum on 11th July 2022.
- ✓ Permission for crushing of boulders from excavated materials received from DFO (Dima Hasao) for 80,000 cum on 20th Dec, 2021 and from NCHAC for 20,000 cum, on 8th Mach 2022.
- ✓ Permission for installation of batching plant at Totelangso, Dima Hasao received from Gaon Burah on 30.06.21 and from NCHAC on 19th Oct 21.
- ✓ CTE and CTP for the batching plant at Totelangso, Dima Hasao (near Power House) received from PCBA on 11th November 2021 and 27th December 2021 respectively.
- ✓ CTE and CTO for the batching plant near Dam site received from PCBA on 23rd June 2022 and on 31st October 2022; however, the CTO is only for 714cum/day as against 1000cum/day required.
- ✓ Permission received from Gaon Burah for the establishment of crusher plant.
- ✓ Permission for installation of crusher plant at Totelangso, Dima Hasao received from Gaon Burah;
- ✓ CTE and CTO for the crusher plant at Totelangso, Dima Hasao received from PCBA on 22nd October 2021 and on 7th December 2021; However, the CTO is only primary and secondary crusher; CTO for the tertiary crusher to be obtained/amended.
- ✓ The CTO for the crusher plant obtained on 11.01.2023 and the same is for stone aggregate of 33378MT/Month and by product (Quarry wastage 5006 MT/Month and stone dust 3337 MT/month).
- ✓ NOC for tree cutting obtained for CP-2.
- ✓ (NOC) from Deputy Commissioner Govt. of Assam, for setting up Fuel dispensing Unit at Project location has been obtained.
- ✓ NOC from controller of explosives for the fuel dispensing unit on 18.01.2023 and is valid till 31.12.2023 (included in SEMR) for existing petrol pump at village Longku for the CP-2 contractor.
- ✓ NOC also received from Joint Chief Controller of Explosives for storage of only 20 KL of petrol received on 18.01.2023 to CP-2 contractor.
- ✓ NOCs for Magazine area for the storage of explosives are obtained including file NOC/license and is prior to July 2022.
- ✓ NOC for Blasting operation have been received from Deputy commissioner, SP, DM, and Sr. Station Officer (SSO) -Fire and Emergency service station, Dima Hasao
- ✓ CP-2 contractor has obtained group personal accident policy for staff and labours along with insurance for contractor plant and machinery and car insurance.
- ✓ CP-3 and CP-4 contractors have obtained workmen compensation insurance.
- ✓ Memorandum of Changes was approved by CEA, CWC, GSI, CSMRS, Govt. of India on 9th November 2022.
- ✓ Environmental clearance for the 4.6 ha quarry near Kala Nala received on 28.03.2023;
- ✓ Consent to Establish for the Hydro-Power Plant received on 28.02.2023

- ✓ Confirmation from Dima Hasao autonomous council received to mention that the site near Longku Nala, Longku adjacent to NH-627 under Dima Hasao district is not listed with the archaeological Department of the council.
- ✓ Consent from Gaon-Burrah received on 10.12.2022 for sourcing water for construction from Longku Nala for CP-2.
- ✓ Labour license received for CP-1 (received on 15.03.2023 and valid till 11.03.2024), CP-3 (Received on 02/03/2023 and valid till 26.02.2024) and CP-4 (received on 20.02.2023 and valid till 12.02.2024).
- ✓ Migrant labour license obtained by CP-4 contractor for 30 labours and is valid till 24.05.2024.
- ✓ (NOC) from PESO for the fuel unit was valid till 31.12.21 and finally renewed on 18.01.2023 valid till 31.03.2024.
- ✓ Insurance policies are obtained by CP1 is valid till 19.02.2024, insurance policy obtained by CP-2 with coverage period till 31.03.2024, insurance policy obtained by CP-3 with coverage till 13.03.2025, insurance policy of CP-4 is valid till 11.07.2024.
- ✓ CP-1 contractor received NOC for ground water extraction from CGWA, Minisrty of Jal Shakti (MoJS) on 17.04.2023 and is valid up to 16.04.2028.
- ✓ CTE for RO plant received by CP-2 contractor on 14.03.2023; CTO for RO plant received by CP-2 contractor on 26th April 2023
- ✓ CTE for the water treatment plant received by CP-2 contractor on 14.02.2023 and CTO for the water treatment plan received by CP-2 contractor on 26th April 2023.
- ✓ CTO amendment for batching plant near dam site for the 1000 cum/day obtained on 03.01.2023 and is valid till 31.03.2025.
- ✓ Migrant Labour licence received by CP-2 validity is still 20.09.2024.
- ✓ Migrant labour license received by CP-3 and validity is still 24.09.2024 (enclosed in Annexure VII)
- ✓ NOC received from ground water extraction to be initiated by CP-3 contractor on 23.12.23 and valid till 21.12.2028
- ✓ Permission for extraction of surface water obtained from Gaon Burah by CP-4.
- ✓ Migrant labour license has been received by CP-4 and validity is still 24.5.24.

During this period the consents, permits that are still pending are reported in **Table 2.2** along with their latest position (if the permission is received in the subsequent months) is also mentioned.

Table 2.2: Compliance with Statutory Requirements

S.N.	Outstanding issue	Compliance Status	Remarks
1	Amendment of Environment Clearance	Being Complied.	Application for the amendment of the EC approval submitted to PARIVESH Portal 2.0 on 4th September, 2023 on the changes made so far due to detail engineering design.

S.N.	Outstanding issue	Compliance Status	Remarks
			EDS replied on 25.09.23 and EAC held on 26.10.23.
2	Request for permission for blasting during night in tunnel of 120 MW Lower Kopili HE Project (Dima Hasao)	Complied	*It has been renewed on 2nd May 2023 with a validity till 31st March 2024. No night blasting has been carried out by CP-2 contractor in the month of April 2023. Same has been confirmed by CP-2 contractor through e-mail dated 29.06.24. Tunnel breakthrough was achieved on 16.09.2023.*
3	NOC for Explosive Handling by District Magistrate Dima Hasao	Valid till 13 July 2023	Being Complied Renewal letter submitted on 20 June 2023
4	Blasting permission at Hamren Division, Karbi Anglong [Left Bank of Dam] was received on 14th October 2022	valid till 13 April, 2023. Being Complied	Renewal letter submitted *No blasting performed in the left bank since expiry of the permission.*
5	NOC from controller of explosives for the fuel dispensing unit	valid till 31. December.2023	Renewal application is required to be submitted
6	NOC for tree cutting CP-1	Being Complied	Revenue submitted to Forest Department for NOC
7	Building and Other Construction Works (BOCW) CP1	Being Complied	On progress
8	CTE for the proposed STP under CP-1	Yet to be applied	This permission is required before construction of STP.
9	CTE and CTO for the RO plant established by CP-3	Being Complied	Yet to be obtain
10	NOC for tree cutting CP-4	Being Complied	Permission awaited. Tree inventory for package -4 completed for 146 towers, except around 7 towers in the

S.N.	Outstanding issue	Compliance Status	Remarks
			Longku side and in the Shankardev Nagar side.

Verification & Validation of Statutory Clearances:

21. The available NOCs and NOC's pending are clearly indicated in the SEMR (Jul-Dec 2023). However, following corrections/clarification are suggested SEMR verification report are concluded as follows:

- ✓ NOC for tree cutting for CP-2 is not included in the SEMR.
- ✓ Night shift blasting has been expired in March 2023. The status of application is not clear from SEMR. In the SEMR it has been mentioned that no further blasting has been taken up since March 23. This may be checked and confirmed. However, as per EMC visits the renewal of the blasting permission received on 22nd May 2023. Further clarity is required in the SEMR submitted by APGCL
- ✓ Blasting permission at Hamren Division, Karbi Anglong [Left Bank of Dam] was received on 14th October 2022 with a validity till 30th April 2023. As per EMC review the renewal letter has been submitted to concern authority after which the status of the renewal was not apprised to the EMC. It was communicated that; no blasting operations has been performed in the left bank since expiry of the permission. Further clarity or updated status is required in the SEMR submitted by APGCL.
- ✓ The need of permission from Gaon Burah for the extractor of surface water by CP-1 contractor is not clear in the SEMR.
- ✓ CP-3 has received the permission from Gaon Burah for surface water (checked during visit) and included in the Annexure20 of SEMR and NOC also received from CGWA for ground water abstraction (included in Annexure 8 of SEMR).
- ✓ DFO, Dima Hasao (West Halflong) gave an order to RO to realise royalties from HiTech Rock Products and Aggregates Limited for 3,36,000 cum on 11th July 2022. EA may confirm that the land does not belong to forest, and hence no approval/forest clearance is needed.
- ✓ NOC for the extraction of 600cum/day of water from river Kopili for construction water has been obtained by CP-2 contractor from PCBA on 26.4.23 and is valid till 31.03.24.
- ✓ Surface water extraction permission from Gaon Burrah by CP-3 is still pending. Status of the same is required to be updated in the SEMR submitted by APGCL.
- ✓ CTE and CTO for the RO plant established by CP-3 has not been obtained yet by CP-3. The status accordingly needs to be updated in SEMR.
- ✓ CTE for the proposed STP under CP-1 is yet to be applied and will be applied before construction of STP.
- ✓ Migrant labour license has been received by CP-4 and validity is still 24.5.24.
- ✓ Permission for extraction of surface water obtained from Gaon Burah by CP-4 and included in the SEMR in Annexure -9. Similarly include the permission as received by CP-3 on 20.11.2023.

2.3 ENVIRONMENTAL LOAN COVENANT COMPLIANCE

22. The loan agreement between ADB and the Government of India was signed for the Assam Power Sector Investment Programme (Project 3) on December 30, 2020. The Environmental loan covenants are mostly described in Schedules 4 and 5 of the loan agreement. Schedule 4 of the agreement provides details of "Procurement of Goods, Works, and Consulting Services." Under this schedule, Paras. 6 and 8 pertain to compliance. Paragraph 6 specifies that no work shall commence until and unless the EIA for the scheme is approved, and Paragraph 8 mentions the selection of an external monitoring consultant and the validation of Environmental Monitoring reports by APGCL. Schedule 5, on the other hand, is related to "Execution of Projects", its implementation arrangements, safeguarding the environment and social, safeguard-related provisions in the bidding documents and works contracts, and safeguard monitoring and reporting.

23. The loan covenants for environmental safeguards stated under various schedules of the loan agreement are either complied with or being complied with and are presented in **Table 2.3.**

Table 2.3: Compliance with Loan Covenants

S. N.	Reference	Specific covenant/condition	Compliance as on December 2023	Remark
1	Schedule 4, Para 6 related to clearance of updated EIA by ADB	The borrower shall ensure or cause the APGCL to ensure that it shall not allow commencement of civil works under a works contract which involves environmental impacts until the APGCL has obtained the final approval of the EIA from the relevant Environmental Authority of the borrower and the state and the ADB;	Being complied.	The main EIA, along with three supplementary EIAs, was cleared by ADB in 2018, and Environmental clearance was granted by MoEF&CC via an EC letter dated September 4th 2019. The amendment of EC is in process. An interim EIA addendum upto December 23 along with EMP has been updated by APGCL and submitted to ADB for disclosure.
		(ii)APGCL has incorporated the relevant provisions from the EMP into the works contract;	Being Complied	The downstream impact assessment is in progress and once it is completed the EIA addendum will be finalized by June 24.
		(iii) the EIA is updated to reflect the turnkey contractors' detailed design and up to date baseline and	Being Complied.	Based on these changes necessary EC amendment/modification is also required and the same was initiated by APGLC through application in Parivesh portal of MoEF&CC on 4th September 2023 on the changes made so far due to detailed engineering design for approval. The EAC was held on 26.10.2023 and EC has been received on 03.01.2024 .
		(iv) such updated EIA is cleared by ADB		
2	Schedule 4, Para8 related to engagement of EM and submission of various reports to ADB	The borrower shall ensure or cause the APGCL to ensure to recruit a consulting firm for external validation of the Environmental	Being complied	APGCL has appointed M/S Feedback Infra Private Limited (JV) with Jade Consult P. Ltd. and Aqualogus-Engenharia Ambiente as EMC. Contract awarded on 24th December 2021.

S. N.	Reference	Specific covenant/condition	Compliance as on December 2023	Remark
		Monitoring report produced by APGCL.		
		The Borrower shall ensure or cause the APGCL to apply individual consultant selection for Consulting Services.	Being complied by APGCL	
3	Schedule 5, Para 5, related to Health and Safety measures and its inclusion in Contractor's design	The borrower shall ensure or cause the APGCL to ensure that the preparation, design, construction, implementation, operation and decommissioning of the project and all the project facilities comply with (a) all applicable laws and regulations of the borrower and the state relating to Environment, Health and Safety (b) The Environmental Safeguards, (c) the EARF (d) all the measures and requirements set forth in the EIA and EMP and any corrective or preventive action set forth in a Safeguard Monitoring Report.	Being complied.	Most of the permissions are received but still a few permits, clearances, and NOCs required for the project, which are pending and are mentioned in the SEMR prepared by APGCL. The updated status to be mentioned in the next SEMR (Jan-June 2024).
4	Schedule 5, Para 9, budgetary provision, and human resource provision related to full implementation of EMP	The borrower shall ensure or cause the APGCL to ensure that all necessary budgetary and human resources to fully implement the EMP and the RIPP as required are made available on a timely basis.	Being complied	It is suggested that qualified and well-experienced EHS experts need to be appointed under SESC (PMU) for EHS and OHS compliance and supervision. PMC also requires the appointment of an EHS and senior environmental expert.

S. N.	Reference	Specific covenant/condition	Compliance as on December 2023	Remark
5	Schedule 5, Para 10: Safeguard related documents in biding document and works document.	Safeguard Related Provisions in Bidding Document and Works contracts: The borrower shall ensure or cause the APGCL to ensure that all bidding documents and contractor for works contain provisions that require contractors to: comply with the measures and requirements relevant to the contractor set forth in the EIA, EMP and the RIPP and any corrective or preventive actions set forth in a safeguard Monitoring Report;	Being Complied.	Such details are included in the bid document for the individual work items. Any revisions to the amended EMP that are necessary must also be updated in the Bid document.
		(ii) budget for environment and social measures;	Being Complied	
		(iii) unanticipated environmental and social risks that arise during construction, implementation and operation stage of the project and is not included in the EIA/EMP or RIPP, RF or IPPF.	Being complied	
		(iv) Record conditions of roads, agricultural land other infrastructure prior to starting transport materials and construction.	Being Complied	The CP-2 contractor has already constructed approach roads for reaching the dam site, powerhouse site, and other ancillary areas of the project for the transport of construction materials and E&M equipment to be installed by the CP-3 contractor.

S. N.	Reference	Specific covenant/condition	Compliance as on December 2023	Remark
		(v) fully reinstate pathways, other local infrastructure, and agricultural land to their pre-project conditions upon completion of construction	Being Complied	
6	Scheule5, Para 11: Safeguard Monitoring and Reporting	The borrower shall ensure or cause the APGCL to ensure the following: Submit semi-annual Safeguard Monitoring Reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission.	Being Complied	Semi-annual safeguards monitoring reports are being submitted to ADB for review on a regular basis;
		(ii) if any unanticipated environmental and or social risks and impacts arise during construction, implementation, or operation of the Project that were not considered in the EIA, EMP, RIPP, RF or the IPPF as applicable promptly inform ADB of the occurrence of such risks or impacts with detailed description of the event and proposed corrective action plan and	Being Complied	The EIA addendum was submitted to ADB in the month of May 2023. Review and finalisation of the EIA addendum is in progress.
		(iii) report any breach of compliance with the measures and requirements set forth in the EMP or RIPP promptly after becoming aware of the breach.	Being complied	Semi-annual safeguards monitoring reports are being submitted to ADB for review. Further compliance with corrective actions suggested during past missions is also submitted by APGCL subsequently.

S. N.	Reference	Specific covenant/condition	Compliance as on December 2023	Remark
7	Schedule 5 para 12, (Prohibited Investment Activities)	The Borrower shall ensure, or cause the APGC to ensure, that no proceeds of the Loan under the Project are used to finance any activity included in the list of prohibited investment activities provided in Appendix 5 of the SPS.	Being complied	The project scope does not include any activity included in the list of prohibited investment activities.
8	Schedule 5 para 13, Labour Standards, Health and Safety	Labour Standards Health and Safety. The Borrower shall ensure or cause the APGCL to ensure that works contracts under that Project follow all applicable labour laws of the Borrower and the State and that these further include provisions to the effect that the contractors: (i) carry out HIV / AIDS awareness programs for labour and disseminate information at worksites on risks of sexually transmitted diseases and HIV / AIDS as part of health and safety measures for those employed during construction.	Partially Complied	All contractors are complying with the labour laws of the GoI. No instance of child labour forced labour, or discrimination in job opportunities was observed during the assessment surveys. PMC reported that HIV/AIDS awareness camps were not organised during the assessment period. Social, HIV/AIDS awareness, and labour law-related trainings need to be organised regularly and scheduled in every quarter.
		(ii) follow and implement all statutory provisions on labour (including not employing or using children as labour, equal pay for equal work) health, safety welfare, sanitation, and working conditions.	Partially complied	Sanitation facilities in labour camps and kitchen areas CP-1 and CP 4 need improvement. Sanitation facilities and labour camps at CP-2 and CP3 were satisfactory, both the contractors have established a drinking water facility.

S. N.	Reference	Specific covenant/condition	Compliance as on December 2023	Remark
		(iii) Such contracts shall also include clauses for termination in case of any breach of the stated provisions in the contract.	Being complied	

Verification and Validation of Environmental Loan Covenants:

- ✓ The EIA addendum is under preparation as per the approved Memorandum of Changes (MOC) dated 9th November 2022; the first phase of the revised EIA addendum same was submitted on 30th May 2023 (mentioned in SEMR) and is under review by ADB. Further interim EIA addendum upto December 23 along with EMP has been updated by APGCL and submitted to ADB for disclosure. The same is mentioned in the SEMR.
- ✓ The downstream impact assessment is in progress and once it is completed the EIA addendum will be finalized by June 24.
- ✓ Based on these changes necessary EC amendment/modification is also required and the same was initiated by APGLC through application in Parivesh Portal of MoEF&CC on 4th September 2023 on the changes made so far due to detailed engineering design for approval. The EAC was held on 26.10.2023 and EC has been received on 03.01.2024.
- ✓ The rest of the covenants are being complied with and accordingly reported in the SEMR.

3.0 COMPLIANCE TO ENVIRONMENT MANAGEMENT PLAN:

24. The main EIA, along with three supplementary EIAs, was cleared by ADB in 2018, and Environmental clearance was granted by MoEF&CC via an EC letter dated September 4th 2019. The revised EIA Addendum is under preparation, and the amendment of the EC is also under process.
25. The Main EIA and the supplementary EIAs also consist of an Environment Management Plan (EMP) with detailed mitigation measures. The time frame and location for implementation of such mitigation measures are also defined in the EMP, along with costs and responsible agencies for the implementation and supervision of the EMP.
26. In addition, an Environmental Monitoring Plan (EMoP) has been prepared to guide key monitoring activities and ensure the effectiveness of EMP implementation. Contractors who are currently working on the project (CP1, CP-2, CP-3, and CP-4) are assigned the duty of adhering to all management strategies outlined in the EMP. Each contractor must adhere to all applicable laws and ADB's safeguard specifications. Additionally, contractors will need to adhere to any project-specific regulations for soil, water, air, noise, and biodiversity.

3.1 BIODIVERSITY CONSERVATION AND WILDLIFE MANAGEMENT PLAN

27. **Establishment of a Biodiversity Management Committee:** The Biodiversity conservation and wildlife management plan requires the formation of a Biodiversity Management Committee (BMC) for effective implementation of the Biodiversity Conservation Programme enlisted in the EMP. The committee is required to have representatives from the project authority, members of the Autonomous Council of Dima Hasao and Karbi Anglong, the Department of Environment and Forests, the Forests and Wildlife Division, and the Assam Biodiversity Board.

28. A Biodiversity Management Committee, as required, has been established, including members of the autonomous council (Dima Hasao and Karbi Anglong), the department of environment and forest and wildlife division, and the Assam biodiversity board. Till June 2022, no meeting has been initiated by the committee; however, in the period (July–Dec 2022), one meeting was held on December 21,2022. The second meeting was conducted on 21.06.23 and the 3rd BMC meeting held on 12.12.23. All the meetings minutes are now included in the SEMR (annexure 21, 22, 23) as was earlier observed in the SEMR verification report. In the 2nd meeting it was agreed that Dima Hasao west division will prepare the next six months proposal covering:

    - Awareness on conservation of wildlife and their habitats near the project area;
    - Annual bird count in winter;
    - Legal training for departmental staff either in Halflong or Kaziranga;
    - Additional support for camera trapping
    - Conservation of a watch tower
    - Construction of anti poaching camp

29. In the 3rd meeting it was agreed that:

- **Annual bird Count:** APGCL will extend Rs 100000 (Rs One Lakhs) for engaging one or two bird experts from the state of Assam to carry out the annual bird count in the project implementation area. A report will be prepared in the 2023 with 3-4 days survey in the month of December 2023.
- **Awareness Camp:** It was agreed that APGCL will support with Rs 50000, one biodiversity and conservation awareness camp will be carried out by Forest Department
- Apart from other points, the provision of Elephant ford was also discussed and it was confirmed that no such ford has been prepared on any natural stream in Assam for the conservation of Asian Elephants. The range officer of Garampani region confirmed that there is a resident population of 30-40 elephants in the upstream of LKHEP submergence area.

30. **Conservation Plan for Floral Species:** The plan requires rehabilitation and restoration of all cleared sites; further, as required under the plan, there is no proposal review suggesting up-gradation of a recreational area at Panimur Forest Ranger Station downstream of the dam, which is currently used as a picnic spot by the general public.

31. **Compensatory Afforestation Programme:** An amount of Rs. 15, 94, 23,850.00 (Rs. Fifteen Crores, Ninety-Four Lakhs, and Twenty-Three Thousand Eight Hundred Fifty) has already been paid to the Forest Department for Compensatory Afforestation (CA) by the Compensatory Afforestation Fund Management and Planning Authority (CAMPA). As per departmental norms, the Forest Department will implement the CA. The 8 patches of revenue land have already been notified as "reserved forest" by the government of Assam. The Forest Department, Govt. of Assam, has taken up the CA for Dima Hasao and Karbi Anglong in the APO of 2022–2023. APGCL will monitor the activities, and the Department will submit the six-monthly progress report to EA so that EA can update the status of CA to the MoEF&CC.

32. At present Nursery has been raised under Dima Hasao West Forest Division. Seedling of different sizes in the newly established nursery nearby the village Torte Langsu. Seedling of different sizes ready for plantation in Longku near the highway around the Forest office. The implementation status of the CA is yet to be included in the APO (FY 2023-24).

33. After reviewing the EMP and BMP and communicating with the site staff, the EMC suggests that the following activities be initiated in close coordination with the Forest Department:

    - Compensatory Afforestation is a seasonal activity and therefore can only be carried out during the pre-monsoon season to ensure a high survival rate for plant species. Therefore, it is suggested to initiate the process of plantation at least 30-45 days before the onset of the pre-monsoon.
    - A biodiversity monitoring awareness programme can be developed with a timeline to provide awareness of biodiversity to the local community.
    - Rehabilitate and restore all cleared sites through compensatory afforestation as and when the structures are complete.

34. **Tree Cutting**- As per tree cutting permission, permission has been accorded for 45349 trees in Karbi Anglong and 20846 trees in Dima Hasao as per Forest Clearance. NOC for tree cutting has been received

for CP-2 and the trees were felled in the presence of officials of the forest department, Panimur Range, Dima Hasao (West) Division and APGCL. All the trees are marked and felled by the respective Forest department. However, in the SEMR, it's not clear whether the 241 trees have been cut by CP-2. EMC checked, and it was found that 241 trees have been cut by the CP-2 contractor in progress with the assistance and presence of officials of the Forest Department, Panimur Range, Dima Hasao (West) Division, and APGCL. The same was also verified by EMC during site visit in the reporting period.

35. **Promote Wildlife Surveys and Monitoring in and around the Project Area-** This activity is aimed at adding to the existing knowledge base on wildlife presence and movements in the vicinity of the project area. The presence of wildlife will be monitored by using camera traps provided by the project. The wildlife survey has to be conducted with the assistance of the Wildlife Division, Department of Environment and Forests. SEMR lacks information on the camera traps installed.

36. **Awareness Raising Programs**- It requires raising awareness among workers and contractors regarding illegal poaching. SEMR has a mention about the poaching activities monitored and awareness carried out among the workers.

37. **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. Construction of Check posts have not been initiated yet.

3.2 CATCHMENT MANAGEMENT PLAN

38. As a requirement, the Catchment Area Treatment Plan (CATP) as proposed in the EIA/EMP report needs to be implemented in consultation with the State Forest Department and in synchronisation with the construction of the project.

39. The CATP includes, afforestation in 683 ha of area, for which work is yet to be started. Also, five nurseries are being developed in Panimur Range, Garampani Range, and Hamren Range, Dima Hasao District at (i) Wayungdisa RF; (ii) Tartelangso RF; (iii) Bagha Dima RF; (iv) Choto Longku RF and (v) Bagha Dima One RF. After these nurseries are developed, they will be maintained by the respective forest department. GAP Plantation in 281 ha of land, pasture development in 574 ha, and construction of the 17-check dam as per the EIA are yet to be initiated.

40. Five nurseries are required to be developed, but, in this period, no such development has happened, but it is planned to be developed in the following forest ranges: (i) Harmen in Dima Hasao; (ii) Panimur range Office area; (iii) Garampani range office area. After these nurseries are developed, they will be maintained by the respective forest offices. Vegetative fencing and watch and ward persons, as suggested in the EIA are yet to be initiated since no afforestation work is there at this time.

41. As per EMC review, an amount of Rs. 28, 29, 67, 000.00 (Rs. Twenty-Eight Crore, Twenty-Nine Lakh, and Sixty-Seven Thousand only) has already been paid to the Forest Department for the implementation of CATP. APGCL is pursuing with Forest Department for implementation. During the assessment period, implementation of the CAT plan has been included in the APO 2022-2023. As informed the preparation of the action plan and implementation of CAT Plan will be initiated in the AOP 2024-2025. Letter dated 11.10.23 enclosed (Annexure IV). The land bank map prepared (Annexure V).

42. A meeting was conducted with the DFO (Divisional Forest Officer) of Dima Hasao, West Division, Halflong on 20.09.2023 with the Biodiversity Expert and aquatic expert of EMC. The meeting with the DFO was productive, and several key points were discussed. The camera trap survey, incidental road kills, and the Dolphin and Mahasheer study were the main topics of discussion.
    - **Camera Trap Survey**- The DFO insisted on supporting the camera trap survey, which is a method used to monitor and track wildlife populations. This survey is crucial in understanding the behavior, habitat, and population dynamics of various species. The camera traps will be placed in the forest area to capture images of animals, which will provide valuable data for conservation efforts.
    - **Incidental Road Kills-** During the meeting, the issue of incidental road kills was also discussed. The DFO suggested placing camera traps in the forest area to monitor and mitigate road kills. This is an essential step in reducing the impact of human activities on wildlife populations.
    - **Dolphin and Mahasheer Study**- The meeting also touched upon the status of the Dolphin and Mahasheer study in the region.

3.3 FISH MANAGEMENT PLAN

43. As per the supplementary EIA (Vol. 3), It is estimated that total annual fish production is about 254 million metric tonnes in this area (Kopili-Kallang Basin Master Plan, Brahmaputra Board, 1995). The supplementary EIA report also mentions that indigenous lotic (fast-water) fish species are found along the Kopili River and its hilly tributaries.

44. As stated in the EIA, no fish or fishing activities were recorded in the main channel of the Kopili River. However, fish are present in the local streams, which support small-scale fisheries using traps and small gear. As per environmental monitoring reports, the pH of the water has increased (but it varies seasonally), but it is not clear whether the change in pH is due to an influx of floodwater or due to the mining ban in the upstream catchment of the river.

45. During the EMC's visit in this period, small fingerlings of fishes were observed.

46. During meeting with DFO (20.9.23) he mentioned that there are no records of Ganges River dolphin in area of influence of the project. Preliminary literature survey also found that the same. However, Presence of *Tor putitora*.(Golden Mahaseer) *Neolissochilus hexagonolepis* (common chocolate mahseer) are important fish species that could survive in the water once water pH reach to normalcy.
47. Low pH levels in the Kopili River were found to hinder aquatic life, and no endangered species were identified. However, four sites were deemed Critical Areas due to the presence of healthy aquatic flora and fauna, suggesting the need for a specialized biodiversity management plan.

48. After reviewing the management plans and communicating with the site staff and locals, EMC suggests that the following activities be initiated or implemented for fish management:

    - ✓ Care should be taken to avoid alien invasive species in the river, both fish and fauna. Lentic water is more likely to have invasive plant species, such as *Eichornia* and *Ludvegia Pruviana* (Barua et al., 2017), and fish species, such as Tilapia.
    - ✓ There should be a regular invasive species monitoring plan at all stages of the project, including the operational phase.

49. EMC team visited Inland Water Department, Guwahati to discuss the presence of Ganges River Dolphin in the Kopili River. During the discussion the department representatives confirmed that the department has not conducted any surveys on waterways near the project site and its near downstream

50. EMC team also met with DFO, Dima Hasao, West Division, Halflong. During a meeting with the Divisional Forest Officer (DFO), it was mentioned that there are no records of Ganges River dolphins in the area influenced by the project. A preliminary literature survey also confirmed this finding. However, the presence of *Tor putitora* (Golden Mahseer) and *Neolissochilus hexagonolepis* (Common Chocolate Mahseer) are important fish species that could survive in the water once its pH reaches normal levels.

51. The EMC has recommended incorporating a fish ladder, anticipating potential improvements in water quality and the introduction of fish species.

52. Also, during the ADB mission (Oct-Nov 23) downstream impact assessment including ecological assessment is underway and details will be included in the next SEMR (Jan-June 24). The scope of work of ecological assessment is included in Annexure 25 of SEMR.

53. During the last ADB mission, a detailed visit was carried out at the Panimur jointly by ADB, PMC and EMC team and it was found that fish can easily pass the small break canyons on river Kopili.


Panimur site -rapids along the small canyons which fish can pass and and travel upstream towards dam site (Date of visit: 1st November 2023)

3.4 WATER QUALITY RESTORATION

54. Draft EIA prepared by WAPCOS (October 2016) was finalized with 3 additional reports namely (i) Cumulative Impacts Assessment (CIA), (ii) an Integrated Water Resources Management Plan (IWRMP) and (iii) a Water Quality Restoration Plan (WQRP) including a mitigation strategy. The supplementary EIA (Volume 4) to the main EIA report is prepared mainly with an objective of Water Quality Restoration (WQR). The main objectives of the WQRP are to determine the sources of acidity due to Rat-hole mining and to identify and design remedial alternatives based on feasibility, cost, and relative effectiveness. As per this WQRP, the Kharkar river is the upstream source of the Acid Mine Drainage (AMD) due to rat hole coal mining practices. The Overall objective of the WQRP is:
    - ✓ Reduce and eventually eliminate the AMD and consequent surface water contamination, up and downstream of Kharkar and Kopili river.
    - ✓ Remediate abandoned mine areas to isolate AMD-producing geologic material.
    - ✓ Restore coal mine affected land to eventually support pre-mine land eco-systems including its flora and fauna;
    - ✓ Restore pre-mining land use including agriculture, horticulture and grazing.
    - ✓ Restore riverine system to pre-AMD quality to support fisheries; and
    - ✓ Guide eventual land use and local economy away from coal mining, to one that promotes sustainable development.

55. AMD problem in the Kopili river Basin: Acid mine drainage (AMD) forms when sulphide minerals have been exposed to oxidising conditions during mining and other excavation activities, such as highway construction. In the presence of oxygen and water, sulphide minerals oxidise to form sulphate-rich and often metal-laden soil. AMD are toxic to vegetation and can reduce the potability of water supplies.

56. Water Quality in the Kopili River Basin: As per the EIA report (April 2018) for the LKHEP scheme, the Water quality in River Kopili has been reported as acidic (pH 3.3 to 5.2) making it unfit for drinking or usage in construction. Further samples were collected during January 17, indicates that Kharkar River, a tributary of Kopili actually carries exceptionally low pH (2.5-3.3) water leading to acidic nature in River Kopili. The supplementary EIA (Vol4: WQRP) reported that the AMD from the rat hole mining in Meghalaya is the major reason for such low pH value in Kharkar River; measures of AMD show pH value in the range of 2.2 to 3.7. In October 2017, MoEF&CC subcommittee reported that the pH value from river Kopili in the range 6.76-6.86 and at Umrang Reservoir in the range of 4.54-4.62. This report of MoEF&CC sub-committee therefore does not report high acidic water in River Kopili.

57. During this reporting period two visits was undertaken towards checking the various measures undertaken under the LKHEP project specific to Water Quality restoration. Visit during this quarter, reaffirmed earlier findings, with spot tests again indicating pH levels of 4-4.5 in the same areas. The presence of pyrite necessitates appropriate neutralization measures, particularly for water from weep holes and tunnels, which are likely to exhibit low pH levels and could cause downstream acidic issues in the river.

58. At the project level, various safeguard measures, such as utilizing SRC cement for protecting water-retaining civil structures, applying acid protection paints in H&M structures and E&M equipment, and implementing other protective measures, have been noticed during this reporting period:
    - ✓ To safeguard the civil structures from the acidic water of river Kopili, protection of water retaining structures has been proposed with Sulphate Resistant Cement (SRC) with suitable admixtures.
    - ✓ A laboratory is also established for the concrete cube test for both the Ordinary Portland Cement (OPC) as well as Sulphate Resistant Cement (SRC). In the laboratory, the SRC cubes are being tested with high acid water (with pH range between 3-3.5) to check the durability of these cubes and assessing the future sustainability of the water retaining structures which will be open to Kopili water. The laboratory team carried out the Water Permeability Test of concrete cubes as per IS-3085-1965, for 28 and 56 days with 7 bar pressure to check how much water can penetrate in the cubes. The weight loss of cubes without and with additives are recorded and maintained. With additive the loss is just 0.076% (after 28 days) and 0.059% (after 56 days). Such results are to be maintained regularly.
    - ✓ For protection of Electro Mechanical structures which are proposed to be exposed to acid water of river Kopili, the CP-3 contractor (M/s Andriz) will use special paints such as Interline 10642.
    - ✓ During this period, it is also observed that sedimentation tank has been constructed and started working in the batching plant (dam site). Regrettably, during the visit, the sedimentation tank was found to be malfunctioning, allowing the washed-out water to flow downstream. Also the slurry from the sedimentation tank has been discharged into the downstream nala, causing blockages and forming a solid concrete bed. The CP-2 contractor has agreed to clear these obstructions in a timely manner.
    - ✓ It was also noted during this visit that some enhancements in batching plant site management are needed to mitigate the risk of slips and falls for personnel working in the area, particularly during rainy conditions when the surface becomes slippery. A compliance report was asked to submit in the subsequent monthly reports.

- ✓ A water treatment plant has been established with a capacity of 6 Lakh Liters per day for usage of water from river Kopili. The pH value of the intake water from river Kopili is 4.6 while the pH of treated water ranges between 7-7.25. The Plant is therefore running well and providing desired results.
- ✓ A RO plant is also established near the L&T office. Water is taken from Longku Nala through tankers which thereafter treated in this plant. Plant is running with meeting the desired results for safe drinking water.
- ✓ Additionally, it was discussed and mutually agreed that solutions employed in Meghalaya or other waste treatment plants might be necessary to neutralize the acidic nature of surface water drainage. In response, EMC has submitted a Water Quality note on "PHYCOREMEDIATION" outlining the treatment plan for acidic seepage water (enclosed in **Annexure IV**).
- ✓ Sufficient budget is allocated under water quality restoration plan (WQRP) for the usage of Phycoremediation and installation of 100 KLD STP.

59. For liquid waste management, the following measures were observed during the reporting period (July-Sept 2023):
    - ✓ CP-2 Contractor Instructions: The contractor has been directed to construct a 100 KLD STP. Currently, grey water from the kitchen and wash areas of the labor colony is being directed to a low-lying area with a gravel bed, where natural vegetation has been observed. A septic tank is used for black water, but the quality of the supernatant is unclear. The contractor has been instructed to submit water quality data.
    - ✓ Wastewater Management: Wastewater from kitchens, bathing areas, and washing areas is diverted to settling tanks before being released into the environment. However, there are instances of direct wastewater release. The CP-2 contractor has ordered DRDO-approved biodigester septic tanks to treat wastewater before release. Water quality monitoring of treated water and the receiving water body will be conducted regularly from the next reporting period.
    - ✓ Budget Allocation: Sufficient budget has been allocated in the Environmental Management Plan (EMP) for pollution control measures, including the STP for the CP-2 contractor.
60. Procurement of Facilities: Under the EMP budget, the procurement of facilities such as 4 portable bio toilets, 2 portable prefab toilets, 2 DRDO bio tanks (4000 liters each), and 2 prefab container toilets has been completed.

3.5 INSTITUTIONAL ARRANGEMENTS & CAPACITY BUILDING

61. Overall, no change in the institutional arrangements of EA was reported during the reporting period. It is observed that regular EHS trainings and fire safety mock drills are being conducted by the CP-2, and regular EHS trainings and toolbox talks are being held by the CP-4. However, it is observed that the following outstanding issues are still prevalent for the current quarter:
    - ✓ As recommended by ADB and EMC during the previous quarter, the appointment of experienced H&S experts under PMU, an environment expert under PMC, and a qualified Environment Expert under CP-1 and CP 4 Contractor is still pending.
    - ✓ All staff and workers working at the site should be trained on Prevention of Sexual Harassment at work (POSH).

- ✓ Since two fatal accidents has already happened under the CP-2, necessary care shall be taken towards avoiding such incidents by providing regular trainings to the employee and labours with respect to harmful chemicals, dangerous activities, working at heights, electrical and other hazards.
- ✓ All staff and workers working at the site are required to undergo social awareness training on local customs, culture, and heritage.
- ✓ All staff and workers working at the site are required to undergo wildlife awareness training covering the protocols to be followed in the event of an encounter with a wild animal.
- ✓ The EHS training module for all package contractors must include incidents of snake and insect bites and train the required staff on how to tackle such medical emergencies.
- ✓ In addition to the above, the CP-1 contractor is required to undertake mock drills and training in EHS-related trainings for construction safety, life and fire safety, electrical safety, etc.
- ✓ As part of the project, EMC shall also provide necessary on the job training and will organize half day-one day workshop on various subjects like dam safety, biodiversity, environmental aspects including occupational health and safety, sustainable development, biodiversity and wildlife management, water quality restoration etc.

3.6 DAM SAFETY MEASURES

62. EMC team visited the LKHEP project components and had several technical discussions will the different stakeholders. A The workshop on Dam Safety was held on Friday, the 21st of July on site, in the APGCL's installations (on site). Main conclusions of the assessment were:
    - ✓ Civil construction works are progressing well, receiving an updated construction schedule is important to track the progress of the works.
    - ✓ Construction drawings and justificative calculations are indispensable for the task of dam safety monitoring. These drawings must be shared with the EMC, as already previously requested.
    - ✓ Hydromechanical equipment are still under design stage.
    - ✓ The slope instability in the right abutment has been cleaned up, a solution for adapting block 20's geometry is under analysis jointly between Design team and Contractor, as well as the slope stabilization measures behind the auxiliary powerhouse.
    - ✓ Dam instrumentation and monitoring documents must be shared, including the definition of the range of expected values.
    - ✓ Reservoir slopes´ stability has to be analysed, identifying eventual potential failure.
    - ✓ Integrated operation and maintenance rules have to be developed, considering also the operation of the upstream dams (considering a cascade operation rational, for example, during sediment flushing operations).
    - ✓ A detailed dam break analysis with the identification of submerged areas and affected populations and infrastructures must be prepared and shared. The scenario of failure of Khandong Dam and Umrong Dam upstream must be considered in this analysis.
    - ✓ Emergency Action plans have to be prepared.

63. Necessary observations given by Dam safety expert has been captured and included in the SEMR and all the recommendations are targeted to be completed by March 2024 by JFPR consultants. The status needs to be updated in the next SEMR (Jan-June 2024).

64. In addition, for the dam break analysis and its revision IIT-Roorkee has been engaged and the status has been mentioned in the SEMR.

3.7 SOLID & LIQUID WASTE MANAGEMENT

65. 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. Package 1, 2, 3 contractors has an agreement with the Umrangso Municipality Board for disposal of Solid wastes.

3.8 MUCK MANAGEMENT MEASURES:

66. As per the EIA 2018, it was projected that 0.985 million m3 of the total 1.407 million m3 of muck that needs to be handled will be disposed of at the two designated disposal sites located within the forest area. However, as per Forest Advisory Committee's (MoEF&CC) suggestion the miscellaneous area and Muck disposal site has been shifted from Forest Land to Revenue and Muck Disposal Plan has been approved. Slope compaction, tree plantation toward prevention of soil erosion in the disposal site is yet to started. This is crucial and should be initiated at the earliest.

67. CP-2 has also submitted a muck management plan. According to that plan, the four permanent disposal sites have been identified with total holding capacity of 27.05 lac m3, and one temporary storage D-5 with holding capacity of 13.5 lac m3. The site wise holding capacity and dumping proposal is given below:

Dumping Sites	Location	Area (Ha)	Capacity (cum)	Dumping Proposal (cum)	Shortfall (cum)
Permanent Dumping Sites					-
D-1	Near Permanent Colony TR5	10.4	17,00,000	5,00,000	-
D-2	Near Colony TR5	3.7	2,90,000		-
D-3	Near PR-7 Dumping Yard-1	4.9	3,07,000	1,55,000	-
D-4	Near PR-7 towards magazine area	6.1	4,08,000		-
Total			**27,05,000**	**6,55,000**	-
Temporary Storage Sites					-
D-5	Temporary storage Facility [33] Near Crusher	12	9,00,000	5,35,578	-
	Temporary storage	2	1,00,000	34,380	-
	Temporary storage	1	1,00,000	14,000	-
	Temporary storage	2.37	2,50,000	1,39,270	-
Total			**13,50,000**	**7,23,228**	

3.9 INTEGRATED WATER RESOURCE MANAGEMENT PLAN:

68. APGCL has awarded the downstream impact assessment to M/s RMSI in the month of December 2022. As per the contract, RMSI is required to prepare a Resource Management System in the Kopili River Catchment Area Community and a Resilience and Disaster preparedness plan for the project. Scope of the assessment includes:

- ✓ To collect real-time data on water inflows and outflows from the hydropower dams on the Kopili River and other relevant tributaries of the Kopili River, as well as to support resource management in the autonomous district councils.
- ✓ Correlate the real-time water inflow data with rainfall data;
- ✓ Undertaking a mapping of the two autonomous district councils to cover village data (including ground water), mineral resources, forest cover, agriculture assets, disaster-prone areas (flooding areas and landslides), etc.;
- ✓ To provide data and help APGCL, the state government, the autonomous district council, the district authorities, and other state agencies such as the Assam State Disaster Management Authority (ASDMA), the state Water Resources Department (WRD), and the Flood and River Erosion Management Agency of Assam (FREMAA) so that they can make informed decisions on the likely impacts on communities and physical infrastructure and take necessary measures to mitigate the impacts;
- ✓ Undertake downstream assessment of the existing 110 km of river embankments;
- ✓ Undertake erosion protection and the needs assessment of additional embankments of 80 km. to protect the downstream districts of Nagaon, Hojai, and Morigaon;
- ✓ Assist the district authorities of Hojai, Nagaon, and Morigaon, the WRD, ASDMA, and FREMAA, to address disasters through better prediction of flooding, improved hydrology modelling, and better disaster risk maps;
- ✓ Prepare a wetland development plan and undertake restoration of wetlands to hold flood waters to help manage the floods.
- ✓ Identify five villages, one in each district, and undertake a needs assessment;
- ✓ Design and implement a participatory village resilience and disaster risk reduction plan to increase resilience and disaster preparedness;
- ✓ Implement the village disaster risk reduction plan in consultation with village communities.

69. As per the status reporting in the current assessment period, Disaster Management Plan is already in place. Moreover M/s. RMSI has been entrusted to implement Community Resilience and Disaster Preparedness for the 5 downstream districts of the LKHEP in the state of Assam. The main activities are described below:

- ✓ Identify six villages, one in each district and undertake a needs assessment. Following the assessment design and implement a participatory village resilience disaster risk reduction plan to increase resilience and disaster preparedness. Implement the village disaster risk reduction plan in consultation with village communities;
- ✓ To develop a robust flood prediction model and an early warning system and correlate to anecdotal evidence for confirmation of flood prone areas and to improve disaster preparedness of the communities, including development of disaster mitigation plans that will be shared with government agencies.
- ✓ Undertake training of state agencies on watershed management and disaster risk management
- ✓ Identify six villages (one from each district) to carry a participatory village resilience disaster risk reduction. Implement the village disaster risk reduction in consultation with the village communities

- ✓ In the trainings, ensure that at least 500 people (90% are vulnerable households of which about 40% to be women) have increased their capacity on disaster risk management. In the process, develop a household evacuation plan for the downstream districts of Nagaon, Hojai, and Morigaon;
- ✓ Conduct training workshops for APCGL, ASDMA, WRD, Disaster Management Committees of the downstream districts of Nagaon, Hojai, and Morigaon.

70. 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.
71. RMSI has submitted the **"Resource Management and Disaster Resilience"** on river Kopili in December 23. This Village resilience plan was prepared in 2023 with community participation following the broad framework of Village DM plan of NDMA. This plan has been prepared for the 5 downstream villages namely:

S.No	District Name	Village Name	Population	Household	Risks	Mitigation Measures	Shelter Capacity
1	Hojai	Dakhin Kenduguri	644 (166 vulnerable)	126	Adjacent to Kopili/Flood risks	VLCC available Need embankment and bank protection. Nearest flood shelter Jogijan Higher Seondary School, Jogijan railway station, Dakhin Kenduguri Durga bari and Janajati School, Dakhin Kenduguri Namgahar, Dakhin Kenduguri Mahadev Bari	1150 (safe)
2	Dima Hasao	Phanglangso	135 (22 vulnerable)	31	---do---	VLCC available but not active Sand mining causing bank failure/erosion One primary school only available with basic facilities has flood shelter else they need to go to hilly areas.	105 (more shelters needed)
3	Karbi Anglong	Namtaradubi	1500 (200 vulnerable)	562	--do--	New embankment under construction on one side. No elevated	250 (need more)

S.No	District Name	Village Name	Population	Household	Risks	Mitigation Measures	Shelter Capacity
						platform for flood shelter Community center, Goroimari LP School, temple and Ringa Bandha are used as shelters.	
4	Morigaon	Thengbhanga	5824 (363 vulnerable)	1110	----do---	VLCC available but not active Need embankment and bank protection No elevated platform for flood shelter Nearest flood shelter - Kali Mandir (temple), and Govt LP School	120 (not safe) and need more shelters
5	Nogaon	Kakoti Gaon	1200 (402 vulnerable)	545	----do----	Flood shelter - road, railway track and the Chaparmukh Railway Station No elevated platform for flood shelter	300 (not safe and need more shelters)

72. The report also provided necessary SOP for the VLCC along with the priority interventions needed.
73. The SOP for the VLCC includes to get into action immediately on receiving the flood warning or information about emergency from DDMA. In case warning came from any other source, as a first step, call the DDMA/DEOC to confirm the information
    - Call an emergency meeting of DMC
    - Check the flood shelters and availability of keys to the buildings and other essentials required in the shelter and rescue operation
    - Inform the DMT and particularly the early warning task forces to alert the villagers
    - Hire generators, store kerosene/diesel/petrol for running the generator at the shelter location
    - Keep a radio with new batteries/smart phone with full charge
    - Arrange flash lights/torch lights and keep extra battery
    - Inform the fishermen not to venture for fishing in the river or ponds
    - Check the flood shelter and store dry food/baby food/clean drinking water etc.
    - Check with PHC and other medical institutions in the villages for stock of medicines, bleaching powder, and halogen tablets. Inform them regarding the warning and request them to be prepared with the essential medicine and first aid items.
    - Keep a copy of the Village DM map ready
    - Inform ration shops and civil supplies shops about the warning and request them to stock food items

- DMC will need to coordinate with respective DMT and ensure that all team members are alerted and aware of their roles and responsibilities in case of an emergency.

74. Priority Interventions Needed:
    - Flood protection work at Nagaon Border from where the Kopili river flood water can enter the village
    - Need raised platform or Multi Propose Community Hall with proper sanitation and drinking water facilities. There should be facilities to address women's needs in the shelter
    - Veterinary clinics during flood time for treatment of livestock
    - Raised platform for livestock
75. Further details will be included in the next SEMR (Jan-June 24). As per the report of RMSI it is noted that these villages are already flood prone and it appears that the existing shelters in these villages are not sufficient during the flood. Even in some of the villages the shelters are less than to accommodate the vulnerable population. So adequate number of flood shelter is needed.

3.10 MAINTAINING THE REQUIRED ENVIRONMENTAL FLOW

76. The river flow is not completely cut off. According to the PMC and package 2 contractor, the imperative to sustain river flow for environmental purposes was taken into account in dam design. As intimated by APGCL, RMSI, under the Japan Fund Poverty Reduction (JFPR) grant, will initiate the downstream study under integrated water resource management (IWRM).

3.11 OCCUPATIONAL HEALTH AND SAFETY MEASURES:

77. During this reporting period many aspects of the OHS measures are included for all the contract package including tool box talks, necessary trainings conducted (EHS, HIV/AIDS etc.). As per SEMR it has been mentioned that one near-fatal accident happened during this reporting period however, there were 30[1] number of near miss cases and 42[2] first aid cases were reported. No accident incident reported in the current period (Jul-Dec 23).

78. It has been mentioned in the SEMR that Root cause analysis is carried out by the contractor and accordingly the corrective action are taken to avoid such kind of accidents in future after any dangerous occurrences, near miss, non-work-related fatalities, LTI.

79. HIV/AIDS awareness training conducted by CP-2 and CP-3, CP-1 and CP-4 are yet to initite these awareness progreamme.

[1] Package wise near miss cases are: CP1-1, CP2-18, CP3-6 and CP4-5;
[2] Package wise first aid cases are: CP1-3, CP2-24, CP3-7, CP4-7

80. Many good practises are also observed, including the professional safety app (by L&T) and IB4U. There is VR-based safety training, which helps the workers understand the safety briefing at their convenience. All these details are nicely captured in the SEMR.

81. The following few observations require some attention:
    - ✓ Occupational health and safety plans are not included in Annexure 18, 28 and 29 of the SEMR as mentioned.
    - ✓ compliance status with respect to following measures must be added to the SEMR:
        - Details of the first aid team as per "First aid teams will be specifically trained and assigned in groups of two to three people to the different sites."
        - Details of the HIV/AIDS awareness programme conducted by all contractor may be provided (e.g. photographs, date of such training etc.) in the next SEMR (Jan-June 24). At present only CP-2 and CP-3 has conducted such awareness programme in the reporting period and has been captured in SEMR.
        - Status on equipment and emergency material required for underground works may be listed along with their calibration status.

3.12 ENVIRONMENTAL MONITORING:

82. As informed by CP-2, quantitative Environmental Monitoring for Air, Water (Surface and Ground), Soil, and Noise quality is being conducted every quarter by M/s. En-vision Enviro Technologies. During the assessment period, quarterly environmental monitoring was conducted in the months of September and December 2023.

83. SEMR has informed about the various Environmental Monitoring measures like Air Quality, Water Quality, Noise Quality.

84. EMP Budget: The table 35 in SEMR captures EMP expenditure, however expenditure incurred for many items are yet to be reported, the same may be included in the next SEMR (Jan-June 24).

3.13 GRIEVANCES REDRESS MECHANISM

85. A Grievance Redress Mechanism (GRM) has been established for the project to handle complaints about environmental and social issues. A grievance redressal committee (GRC)is also in place, and its mandate is to resolve the grievances in a timely manner. As of December 2023, mainly social grievances pertaining to land and compensation-related grievances were reported and recorded for the project in a grievance register maintained at the project site; details of 3 consultations conducted during the reporting period is included in Table 37 of SEMR. No grievances pertaining to environmental parameters such as air, water, or noise pollution, traffic congestion, accidents due to project vehicles, community health and safety concerns due to project activities including blasting, etc. have ever been reported by locals since the commencement of project work.

86. After reviewing the GRM records and communicating with the GRC members, EMC suggests:

- ✓ Ensure the strengthening of GRM at site level for its effective implementation.
- ✓ Ensure that all grievances registered at the project site are recorded and resolved, whether reported by the general public or by labourers or workers engaged in the project's construction.
- ✓ The grievance register needs to be updated and reviewed on a regular basis, and all logs and records need to be maintained properly.
- ✓ Ensure monthly consultation with the local community to record community concerns pertaining to environmental as well as EHS issues, if any. The outcome of the meetings should be recorded in the Monthly Environment Report (MER).
- ✓ GRC meetings should be held every quarter, involving local representatives. Suggestions from the meetings should be recorded in the SEMR.

3.14 CONSULTATION AND INFORMATION DISCLOSURE

87. APGCL, through SESC and PMC, is regularly conducting consultations that include informal and formal discussions and meetings with affected persons (APs), local representatives, and concerned committees. Residents in the area have been informed about the timing of blasting activities and have been given general instructions to avoid entering the project construction site.

88. As understood, an updated downstream impact assessment has been awarded to M/s RMSI. The downstream impact assessment, along with a project-specific disaster management plan that also includes a project site emergency preparedness and evacuation plan, is under preparation. EMC suggests that the same should be communicated to relevant stakeholders, including local residents and communities residing in the downstream areas preferably in local language.

3.15 OTHER ANTICIPATED IMPACT

89. There is a need for immediate interventions (particularly on the right bank of the dam axis) because of significant slope instability and deep rain cuts. There are several locations with loose rocks and boulders on steep slopes that require immediate attention to prevent the risk of subsidence, landslides, and rock falls and to ensure the safety of people moving around on the roads and the workers located below. As agreed during the previous ADB mission, slope protection measures need to be initiated at the earliest.

90. At the package 4 contractor's, the construction workers are provided with very poor accommodation in the labour camp. There were no beds, mattresses, or mosquito nets, and there was no kitchen, bathing, or washing area. There is no provision for first aid at the construction site or labour camp. Firefighting arrangements were also not observed at the construction site and labour camp.

91. A few workers in the community kitchen provided by the package 2 contractor were observed to have been using firewood for cooking.

92. Fire extinguishers placed at the petrol pump by the package 2 contractor are not being audited for service and maintenance checks.

93. These aspects will be checked by EMC on a regular basis and will be reported in the next deliverables, like monthly or quarterly reports, to see compliance.

94. No improvement observed in vehicle wash and maintenance facility by package 2 contractor, untreated wastewater is still being discharged into natural surroundings.

95. The corrective actions taken in compliance to ADB mission observations is captured in Table 8 as action taken report on the ESCAP. The first draft of the EIA addendum has been shared with ADB along with EMP. Based on this EMP the CEMPs are updated by the respective contractors. SEMR has captured all the necessary corrective actions needed from the contractor's end. DG set height is a concern for CP-2 (mentioned in SEMR) as well as for CP-1. Also noted that CP-1 and CP-4 has not conducted the Health and AIDS awareness camp. Annual bird count shall be initiated by the forest department.

96. Tree cutting permission from Dima Hasao (West Division), it may be checked. Only submission of forest royalty does not ensure permission. Actual permission is also necessary.

97. SEMR also mentions status of obtaining updated Environmental clearance in the SEMR with the dates and the EAC was held on 14.11.2023.
98. The corrective action also mentions that the revised EIA addendum shall be submitted in January 24. The details of same shall be captured in the next SEMR (Jan-June 24).

4.0 CONCLUSION AND RECOMMENDATION:

99. Overall, the SEMR has truly addressed the statutory compliance status, ADB loan covenants and corrective measures proposed in the previous ADB mission.

100. Some of the critical findings that require important attention are given below:

- ✓ Community emergency and evacuation plans are yet to be prepared by CP-2 to manage emergencies arising due to accidental failure of cofferdams, etc.
- ✓ Construction of treatment plant for the treatment of black and grey water generated from CP-2 contractors labour camps, kitchen and other arears. The bio-digester septic tank may not be feasible solution until its results are checked and monitored. Regular testing of these water is needed.
- ✓ Also CP-2 may explore the possibility of transferring their waste water from labour camps, kitchen to the proposed STP at CP-1.
- ✓ CP-1 may include the recycling of treated waste water either through dual plumping, landscaping works and at the same time may consider to utilize the rain water harvesting and reuse of these water for flushing and bathroom water needs.
- ✓ CTE and CTO for the RO plant established by CP-3 has not been obtained yet by CP-3. The status accordingly needs to be updated in SEMR.
- ✓ CP-1 yet to receive migrant labour license.

- ✓ Top soil management of CP-1 is an issue and need to be controlled, detailed provided in EMC's site visit report enclosed in Annexure VIII. Heaps of soil should be covered with geotextile/grasses/vegetation.

- ✓ OHSA measures taken so far requires further attention and accident reporting must be prompt to the authority. All contractors need to maintain the safety aspects especially training of labours who will work on height need to be done and fitness certificate to be provided.
- ✓ APGCL may like to consider to include requirements of treating the acidic seepage water from the Power House area and current status of implementation through technologies like Phycoremediation.
- ✓ SEMR mentions that Biodiversity Conservation plan is yet to be initiated by the BMC. Copy of the MoM of BMC are now included in SEMR. An action taken report based on these MoM may be reported in the next SEM (Jan-June 24).
- ✓ Plantation initiated as per green belt development plant, more details to be given in the next SEMR (Jan-June 24).
- ✓ Loss of Biodiversity, Disturbance/accidents/injury to wildlife and avian fauna, it has been mentioned that poaching activities monitored, and awareness carried out among the workers.
- ✓ RMSI has provided the details of Village Disaster Management Plan in December 23. The revision of the plan and summary of the other subsequent reports like downstream impact assessment study may be included in the net SEMR (Jan-June 24).
- ✓ Annual Bird count not initiated. Discussion completed with AARANYAK to carry out the study. Annual bird count will be initiated by the forest department as per the MoM of BMC and the same needs to be reported in the next SEMR.
- ✓ The SEMR need to elaborate on the CATP, other GAP plantation, Pasture development, check dam construction, fish management plan, Integrated Water Resource Management Plan (IWRMP), climate risk and adaptation in the dam design and environmental flow calculation from the next SEMR (Jan-June 24).
- ✓ The fisheries college of RAHA has been appointed for conducting the ecological assessment. The scope of their work is included in the current SEMR. Study outcomes may be reported in the next SEMR.
- ✓ SEMR could also include the details of Dam Safety workshop conducted during this period. SEMR has acknowledge the pending requirements like Dam Break analysis and Dam failure studies which are being done under JFPR and expected by March 24. EMC's dam safety expert has visited site in July 23 and have discussed in length with APGCL and the design team for several times.
- ✓ Under CP-3, Health and Safety expert appointed but Environmental Specialist is yet to be appointed.
- ✓ CP-1 and CP-4 has appointed Environmental expert which was pending earlier.
- ✓ CP-1 yet to appoint H&S officer.
- ✓ Qualified and well-experienced EHS experts need to be appointed under the SESC , and a Health and Safety Committee shall be formed soon with representation of all parties involved in project construction. PMC has appointed EHS expert.
- ✓ All the remaining vehicles (4 in number) registered in Bhutan must be registered with Indian numbers, and a PUC must be obtained.
- ✓ Accident reports, if any, are to be submitted to APGCL within 24 hours of the incident.

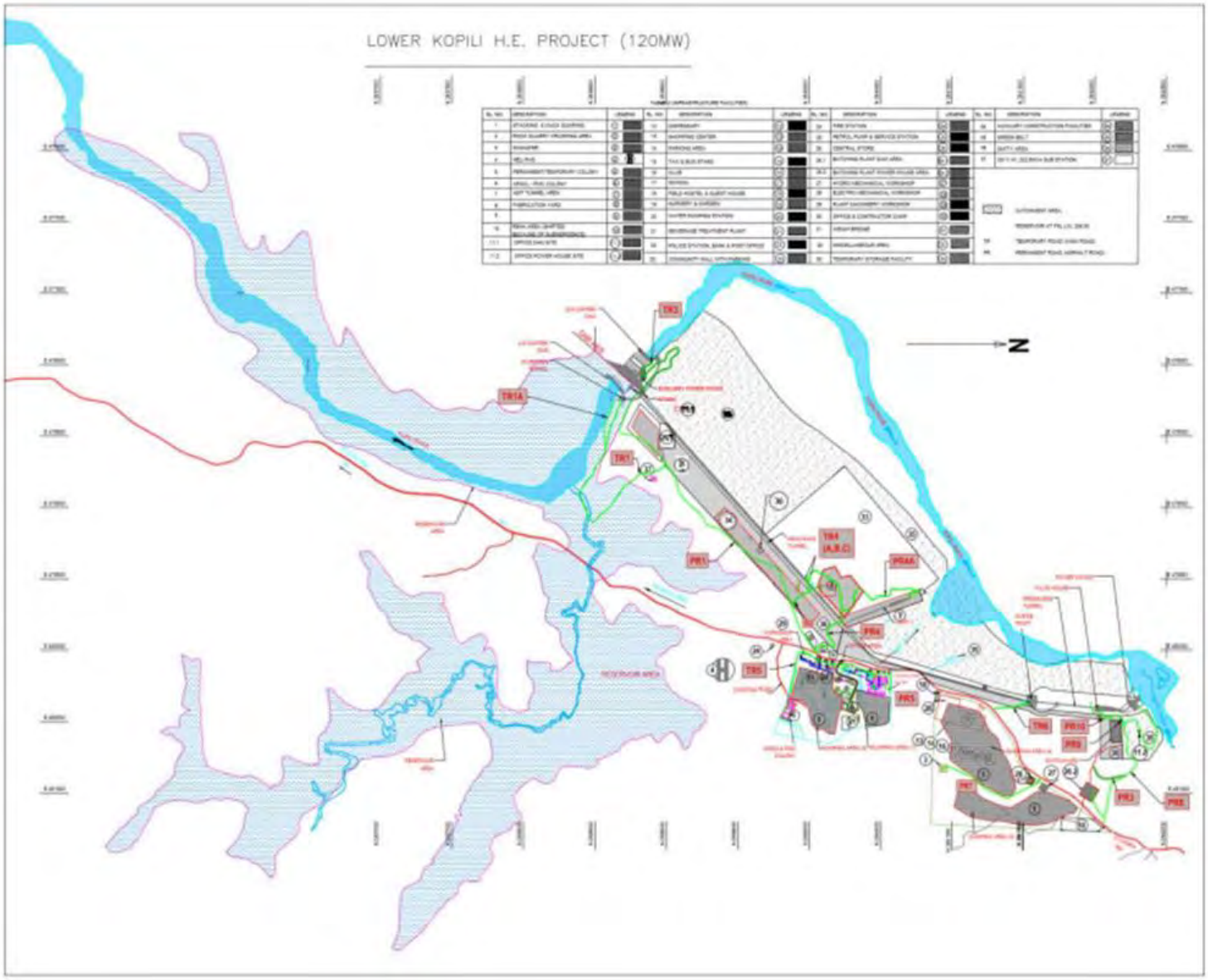
- ✓ The rooms at the camp site for CP-1, CP-2, and CP-3 (under construction) should be provided with proper illumination, a smoke detector, and proper insulation of the electrical system. Labourers at CP-1, CP-3, and CP-4 should be provided with clean water, adequate toilet facilities with respect to the number of labourers, and clean bedding facilities with proper space between two beds.
- ✓ Labourers and other project site officials must also be provided with medicated mosquito nets for protection against malaria, dengue, and other vector-borne diseases.
- ✓ The use of firewood for cooking should be stopped with immediate effect, and cooking gas should be provided in common kitchens.
- ✓ Emergency contact information for First Aiders must be accessible to all and updated as needed.
- ✓ A project awareness programme for HIV/AIDS, wildlife protection, wildlife-human conflict, general EHS requirements, community health safety, and grievance redressal needs to be planned and scheduled every quarter.
- ✓ All contractors have initiated submission of Monthly Environment Report with monthly updates on the implementation status of environmental safeguard compliance. The status of EMP implementation may also be included.
- ✓ Every month, a joint site inspection between the PMC and contractor's (all packages as relevant) representatives is to be made, after which the best solutions to address the inspection's results are to be decided and submitted as a Monthly Environmental Report along with a monthly EHS review report.
- ✓ All contractors are required to develop a legal register to keep track of statutory requirements applicable to the project, such as clearances, NOCs, permits, permissions, etc., for all project components. Initiated.
- ✓ All contractors are required to prepare an incident or accident register record, and all incidents need to be reported in the monthly EHS report. Initiated.
- ✓ Ensure the strengthening of GRM at site level for its effective implementation.
- ✓ All formal and informal complaints, requests, and grievances should be recorded, and adequate closure should be provided. Post-closure, the complainant should be adequately informed. Grievance register is now maintained.
- ✓ Ensure monthly consultation with the local community to record community concerns pertaining to environmental as well as EHS issues, if any. The outcome of the meetings should be recorded in the Monthly Environment Report (MER).
- ✓ GRC meetings should be held every quarter, involving local representatives. Suggestions from the meetings should be recorded in the SEMR.
- ✓ All contractors are required to ensure that their staff and workers working at the site are trained on POSH at work. HIV/AIDs awareness needs to be conducted on regular basis by all the contractors and at present the same is only limited to CP2 and CP-3.

101. Subject to these observations, the SEMR seems to have captured most of the information pertaining to environmental safeguards taken up for the period July–December 2023.

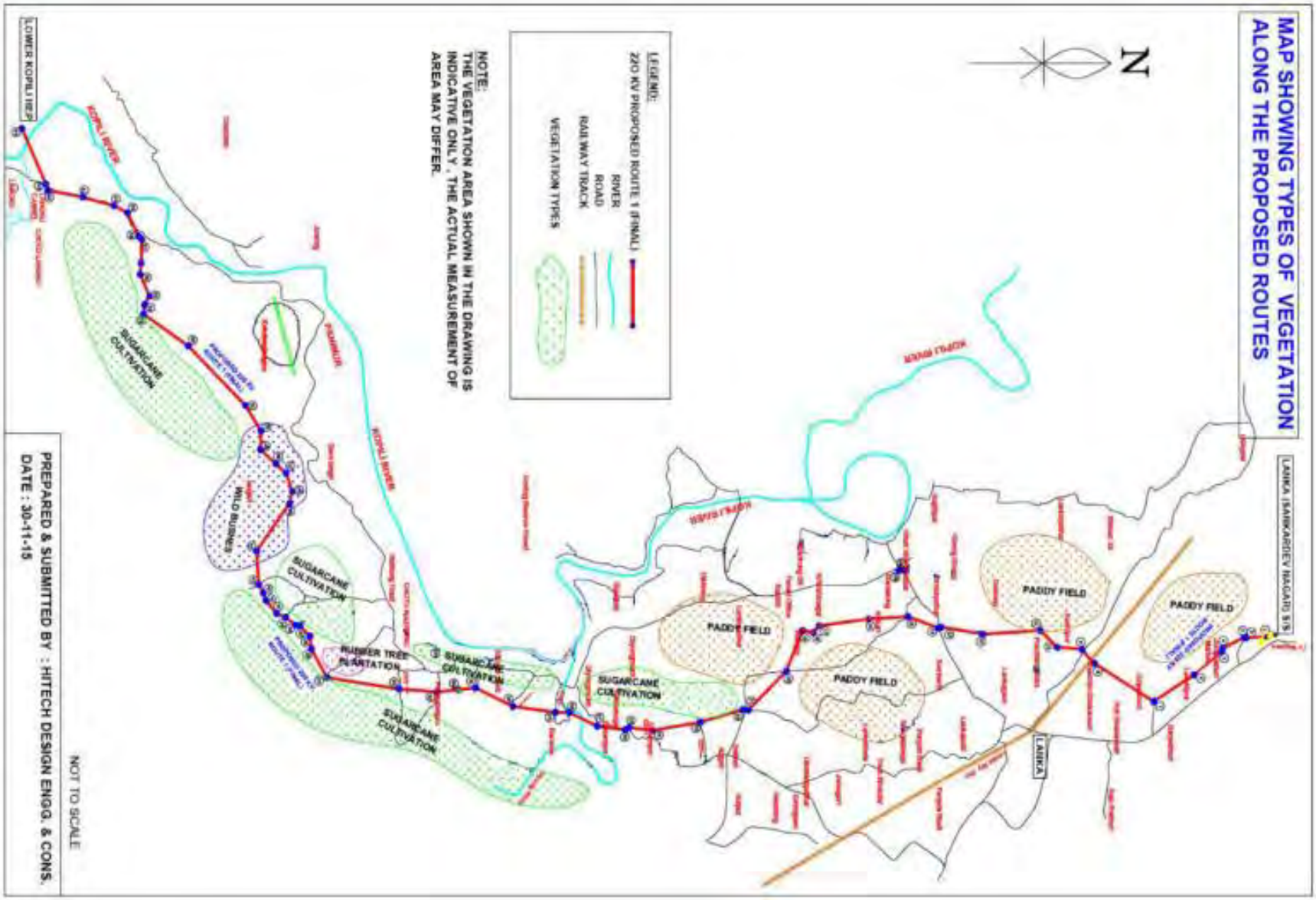
***

Annexures

Project Layout



Layout of Transmission Lines



Map of Reservoir spread boundary

Annexure- II

Renewal copy of Labour license (CP-2)

FORM-VI
[See Rule-25(1)]

LO Office(Haflong)
LICENSE UNDER CONTRACT LABOUR (REGULATION & ABOLITION) ACT, 1970

UBIN	:	**299/566476/AAACL0140P/11/2022**
UAIN	:	**LCFORMIVCL/2023/23298**
License No.	:	**CLL/2023/AQ1701234326018W6**
Date of Issue	:	**29/11/2023**

1. Licence is hereby granted to **LARSEN AND TOUBRO LIMITED** under Section 12(1) of the Contract Labour (Regulation and Abolition) Act,1970 subject to the conditions specified in the Annexure.

2. The Licence is for doing the work of **CIVIL AND HYDRO MECHANICAL AND ELECTRICAL WORKS FOR CONSTRUCTION OF 120 MW LKHEP**, in the Establishment of **120MW LOWER KOPILI HYDRO ELECTRIC PROJECT** ,C/O. **ASSAM POWER GENERATION CORPORATION LIMITED** at **LONGKU, , UMRANGSO, DIMA HASAO - 788931, ASSAM** .

3. The Licence shall remain in force till **07/12/2024** .

4. Maximum No of contract labour proposed to be employed in the establishment on any date : **1500 nos.**

5. VALID FOR **DIMA HASAO** ONLY and only for the purpose mentioned in this certificate.

6. Payment Details:

GRN	AS005782815202324E
CIN	12602023301100001
Txn Date	29/11/2023
Amount	152100.00
Status	Y

(Scan the QR Code for authentification)

LO Office(Haflong)
Licensing Officer

*** This is a computer generated certificate and it does not require a Signature/Seal.***
Terms & Conditions of this Certificate is enclosed as Annexure-I.

Inter-State Migrant Workmen license CP-2

FORM-VIII
[See Rule-11(1)]
GOVERNMENT OF ASSAM
LO Office(Haflong)

LICENCE OF CON TRACTOR FOR EMPLOYMENT OF MIGRANT WORKMEN UNDER INTERSTATE MIGRANT WORKMEN (RE & CS) ACT, 1979

UBIN	:	**299/566476/AAACL0140P/11/2022**
UWN	:	**COLFORMV/2023/00027**
Original Registration No.	:	**MGW(E)/2023/S16837844587 90R3**
Licence No.	:	**MGW(E)/2023/4Q1695292971226E4**
Date of Issue	:	**21/09/2023**

1. Licence is hereby granted to **LOWER KOPILI HYDRO ELECTRIC PROJECT APGCL** under Section 8(1) of the Inter State Migrant Workman (Regulation of Employment and Condition of Service) Act,1979 subject to the conditions specified in the Annexure

2. The Licence is for doing the work of **CONSTRUCTION AND ERECTION OF 120 MW LOWER KOPILI HYDRO ELECTRIC PROJECT** , in the Establishment of **LOWER KOPILI HYDRO ELECTRIC PROJECT APGCL** at **3RD FLOOR , BIJULI BHAWAN ,PALTAN BAZAR GUWAHATI,KAMRUP,781008 ASSAM**

3. No. of migrant workers to be engaged **100 nos.**

4. The License shall remain in force till **20/09/2024 .**

5. Payment Details

GRN AS003640799202324P
CIN 10004672023092103406
Txn Date 21/09/2023
Amount 30080.00
Status Y

LO Office(Haflong)
Licensing Officer

(Scan the QR Code for authentification)

*** This is a computer generated certificate and it does not require a Signature/Seal.***
Terms & Conditions of this Certificate is enclosed as Annexure-I.

Government of India
Ministry of Jal Shakti
Department of Water Resources, River Development and Ganga Rejuvenation
Central Ground Water Authority (CGWA)
Application for Issue of NOC to Abstract Ground Water (NOCAP)

Application for Permission to Abstract Ground Water for Infrastructure Use (Save As Draft Application for New NOC)

Save As Draft Application Code : 93267

(Scanned copy of this page after signature and seal should be attached at "Application with Signature and Seal" in attachment section before submission of application)

Name of Industry:	LOWER KOPILI HYDROELECTRIC PROJECT
Location Details of the Industrial Unit	
Address Line 1 :	LONGKU
Address Line 2 :	NEAR PMC COLONY
Address Line 3 :	
State:	ASSAM
District:	DIMA HASAO
Sub-District:	DIYUNGBRA
Village/Town:	Lanku
Net Ground Water(m3/day):	29.00
Area Type Category :	Safe

INDUSTRIAL USE- Self Declaration

I hereby certify that the data and information furnished above are true to the best of my knowledge and belief and I am aware that if any part of the data / information submitted is found to be false or misleading at any stage, the application will be rejected outright.

I hereby declare that all the mandatory documents prescribed in the application form have been uploaded and no blank /irrelevant documents have been uploaded. I am also aware that any false/ wrong submission /uploading of document will lead to rejection of my application without any notice.

It is to certify that no case related to ground water withdrawal/ contamination is pending against the industry/ project/ unit as on date. Any such case filed against the company/ project/ unit in respect of ground water withdrawal/ contamination during the pendency of this application shall be immediately brought to the notice of CGWA.

I hereby undertake that in case any environmental compensation/ penalty is imposed on the firm by any statutory authority, I shall comply with the decision of such authority.

/

मैं यह प्रमाणित करता हूं कि ऊपर प्रस्तुत किये गऐ आँकड़े और जानकारी मेरे ज्ञान और विश्वास के अनुसार सही हैं और मुझे पता है कि यदि प्रस्तुत आँकड़े / सूचना का कोई भी भाग किसी भी स्तर पर गलत या भ्रामक पाया जाता है, तो आवेदन बिना किसी पूर्व सूचना के निरस्त कर दिया जाएगा।

मैं इसके द्वारा घोषित करता हूं कि आवेदन पत्र में निर्धारित सभी अनिवार्य दस्तावेजों को अपलोड किया गया है और कोई रिक्त / अप्रासंगिक दस्तावेज अपलोड नहीं किया गया है। मुझे यह भी पता है कि कोई भी गलत दस्तावेज अपलोड करने पर मेरे आवेदन को बिना किसी सूचना के निरस्त कर दिया जाएगा।

यह प्रमाणित करता हूँ कि उद्योग / परियोजना / इकाई के खिलाफ आज तक भूजल निकासी / प्रदूषण से संबंधित कोई भी मामला किसी भी न्यायालय में लंबित नहीं है। इस आवेदन की प्रक्रिया के दौरान भूजल निकासी / प्रदूषण के संबंध में कंपनी / परियोजना / इकाई के खिलाफ दायर किसी भी मामले को तुरंत के. भू. ज. प्राधिकरण के ध्यान में लाउंगा।

मैं इस बात का वचन देता हूं कि यदि किसी भी वैधानिक प्राधिकरण द्वारा फर्म पर कोई पर्यावरणीय क्षतिपूर्ति / जुर्माना लगाया जाता है,तो मैं प्राधिकरण के उस निर्णय का पालन करूंगा।

Site Manager
Andritz Hydro Pvt. Ltd.
Lower Kopili Hydro Project
Vill.-Longku, Dist. - Dima Hasao
State - Assam, Pin - 788931

Date : 27-07-2023

Place : Longku

Name & Signature of the applicant (With seal)

User Name : rramkumar

* In case signed by any authorized signatory, the details of the signatory with the authorization shall be enclosed.

Air Monitoring Results

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TC-7669

TESTREPORT

AMBIENT AIR ANALYSIS REPORT
Rep.No. AAAR_1503163_01_276 **Date: 31/08/2023**
Sample ID: EETNE/AUG/11/23 **ULR NO.: TC766923000000056F**

Issued to : M/s. Andritz Hydro Pvt. Ltd., LKHEP Project, village – Longku, Dist. Dima Hasao, Pin - 788931

Sample Drawn By : UTPAL BEZBARUAH
Sampling Plan & Procedure : EETNE/SOP/01
Analysis Duration : 25/08/23 TO 29/08/23, 26/08/23 TO 30/08/23, 27/08/23 TO 31/08/23
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_{10} ($\mu g/m^3$)	$PM_{2.5}$ ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	HC (mg/m^3)	CO (mg/m^3)	SO_2 ($\mu g/m^3$)
i)	25/08/23	Near Service Bay	Clear	38.9	23.4	13.9	BDL	BDL	9.8
ii)	26/08/23	Near valve house		39.7	28.6	14.6	BDL	BDL	9.8
iii)	27/08/23	Near project Camp		37.9	26.7	13.4	BDL	BDL	8.1

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

Sl. No.	Pollutant	Test Method	Time Weighted Average	Concentration in Ambient Air: Industrial, Residential, Rural and Other Area
1	Particulate Matter (PM_{10}), $\mu g/m^3$	IS:5182 Part-XXIII/ CPCB	Annual	60
			24 hours	100
2	Particulate Matter ($PM_{2.5}$), $\mu g/m^3$	EETNE/SOP/01/2017	Annual	40
			24 hours	60
3	Nitrogen Dioxide (NO_2), $\mu g/m^3$	IS:5182 Part-VI/ CPCB	Annual	40
			24 hours	80
4	Carbon Monoxide (CO), mg/m^3		8 Hours	2.0
5	Sulphur Dioxide (SO_2), $\mu g/m^3$	IS:5182 Part-II/ CPCB	Annual	50
			24 hours	80

For Envision Enviro Technologies North East, Guwahati

Khairul Islam Sheikh
(Environmental Chemist)

Utpal Bezbaruah
(Technical Manager)
Authorized Signatory /Reviewed by

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.

Noise Monitoring Results

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TEST REPORT

AMBIENT NOISE LEVEL MEASUREMENT REPORT
Rep.No. ANLMR_1503163_06A_277 **Date: 31/08/2023**
Sample ID: EETNE/AUG/11/23 **ULR NO.: TC766923000000856F**

Issued to : M/s. Andritz Hydro Pvt. Ltd., LKHEP Project, village – Longku, Dist. Dima Hasao, Pin - 788931

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)	26/08/23	Near Service Bay	60.9	47.9
ii)	27/08/23	Near Valve House	57.2	42.9
iii)	28/08/23	Near Project Camp	58.3	46.7

Remarks: Noise level is carried out during 75% of the Day Time & Night Time.
Method of analysis : CPCB July 2015 guideline.
Sampling Instrument Used : SLM100 SLNO484-I-22, SLM 100 (213 DTC-2013)

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

Khairul Islam Sheikh
(Environmental Chemist)

Utpal Bezbaruah
(Technical Manager)
Authorized Signatory /Reviewed by

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.

----------END OF REPORT----------

Ground Water Quality Monitoring Results

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TC-7669

TEST REPORT:
Report No: 230831_1503163_2
ULR No: TC766923000000115P
Sample ID No: EETNE/AUG/19/23
Test Starting Date: 25/08/2023

Date of Report: 31/08/23
Date of sample receipt: 25/08/2023
Test completion Date: 31/08/23

Name & Address of Client	**M/s. ANDRITZ HYDRO PVT. LTD., LKHEP Project ,village- Longku ,Dist- Dima Hasao, Pin- 788931.**					
Sample Description	**Type: Raw water**				**Source: borewell**	
Sample collected by	**M/s. En-vision Enviro Technologies North East**					
Sample Collection Particulars	**Date 25/08/2023**	**Time 10:45 A.M**	**Temperature 31°C**	**pH 6.71**	**Quantity Drawn:4L**	**Sampling Method: EETNE/SOP/02**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
1	pH	---	6.68	APHA 23rd Edition,4500 H+,Page:4-95	6.5-8.5
2	Turbidity	NTU	4.6	APHA 23rd Edition,2130,Page:2-13	5
3	TDS	mg/L	68.6	APHA 23rd Edition,2540 C, Page :2-69	2000
4	TSS	mg/L	81.2	APHA 23rd Edition,2540,Page:2-70	----
5	Oil and Grease	mg/L	<5	APHA 23rd Edition,5520 B,Page:5-42	----
6	Dissolved Oxygen	mg/L	5.4	APHA 23rd Edition,4500-O C,Page:4-146	6
7	Total hardness	mg/L	72.5	APHA 23rd Edition,2340 B,Page:2-48	600
8	Calcium	mg/L	38.6	APHA 23rd Edition,3500-Ca B,Page:3-69	200
9	Magnesium	mg/L	22.4	APHA 23rd Edition,3500-Mg B,Page:3-86	100
10	Total Alkalinity	mg/L	35.4	APHA 23rd Edition,2320,Page:2-37	600
11	Sulphate	mg/L	26.2	APHA 23rd Edition,4500-SO_4^{2-}E,Page:4-199	400
12	Nitrates	mg/L	4.4	APHA 23rd Edition,4500-NO_3^-B,Page:4-127	20
13	Phosphate	mg/L	<0.02	APHA 23rd Edition,4500-P,Page:4-163	----------
14	Salinity	%	0.2	APHA 23rd Edition,2520B,Page:2-60	----------
15	Conductivity	µS/cm	81.3	APHA 23rd Edition,2520B,Page:2-60	2500

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Sample ID No: EETNE/AUG/19/23 **Date of sample receipt: 25/08/2023**
Test Starting Date: 25/08/2023 **Test completion Date: 31/08/2023**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
16	Arsenic	mg/L	BDL	APHA 23rd Edition,3114A,Page:3-36	------
17	Iron(as Fe)	mg/L	0.71	APHA 23rd Edition,3500-Fe B,Page:3-80	------
18	Total Coliform	MPN/100	2	APHA 23rd Edition,9222B,Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition,9222 D,Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	4.2	APHA 23rd Edition,5210B,Page:5-6	------
21	COD	mg/L	61	APHA 23rd Edition,5220 b,Page:5-18	------

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Quality Manager
Authorized Signatory

Surface Water Quality Monitoring Results

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RECOGNIZED BY POLLUTION CONTROL BOARD, ASSAM

TC-7669

TEST REPORT:
Report No: 230902_1503164_01
ULR No: TC766923000000116P
Sample ID No: EETNE/AUG/20/23
Test Starting Date: 26/08/2023

Date of Report: 02/09/23
Date of sample receipt: 26/08/2023
Test completion Date: 02/09/23

Name & Address of Client	M/s. ANDRITZ HYDRO PVT. LTD., LKHEP PrOJECT,, village- longku, Dist- Dima Hasao, Pin-788931					
Sample Description	Type: Surface Water (Service Bay)				Source: Kopili River	
Sample collected by	M/s. En-vision Enviro Technologies North East					
Sample Collection Particulars	Date 25/08/2023	Time 10:45 A.M	Temperature 30°C	pH 6.71	Quantity Drawn:2L	Sampling Method: EETNE/SOP/02

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
1	pH	---	6.42	APHA 23rd Edition,4500 H^+,Page:4-95	6.5-8.5
2	Turbidity	NTU	1.48	APHA 23rd Edition,2130,Page:2-13	5
3	TDS	mg/L	18.9	APHA 23rd Edition,2540 C, Page :2-69	2000
4	TSS	mg/L	74.12	APHA 23rd Edition,2540,Page:2-70	------ -----
5	Oil and Grease	mg/L	<5	APHA 23rd Edition,5520 B,Page:5-42	------ -----
6	Dissolved Oxygen	mg/L	4.5	APHA 23rd Edition,4500-O C,Page:4-146	6
7	Total hardness	mg/L	53	APHA 23rd Edition,2340 B,Page:2-48	600
8	Calcium	mg/L	21.3	APHA 23rd Edition,3500-Ca B,Page:3-69	200
9	Magnesium	mg/L	14	APHA 23rd Edition,3500-Mg B,Page:3-86	100
10	Total Alkalinity	mg/L	23	APHA 23rd Edition,2320,Page:2-37	600
11	Sulphate	mg/L	22.6	APHA 23rd Edition,4500-SO_4^{2-} E,Page:4-199	400
12	Nitrates	mg/L	6.1	APHA 23rd Edition,4500-NO_3^- B,Page:4-127	------ -----
13	Phosphate	mg/L	<0.02	APHA 23rd Edition,4500-P,Page:4-163	------ -----
14	Salinity	%	0.2	APHA 23rd Edition,2520B,Page:2-60	------ -----
15	Conductivity	µS/cm	86	APHA 23rd Edition,2520B,Page:2-60	2500

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Sample ID No: EETNE/AUG/20/23 **Date of sample receipt: 19/07/2023**
Test Starting Date: 26/08/2023 **Test completion Date: 02/09/2023**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
16	Arsenic	mg/L	BDL	APHA 23rd Edition,3114A,Page:3-36	------ -----
17	Iron(as Fe)	mg/L	0.92	APHA 23rd Edition,3500-Fe B,Page:3-80	------ -----
18	Total Coliform	MPN/100	4	APHA 23rd Edition,9222B,Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition,9222 D,Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	5	APHA 23rd Edition,5210B,Page:5-6	------ -----
21	COD	mg/L	43	APHA 23rd Edition,5220 b,Page:5-18	------ -----

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory

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TC-7669

TEST REPORT:
Report No: 230902_1503163_01
ULR No: TC766923000000117P
Sample ID No: EETNE/AUG/21/23
Test Starting Date: 26/08/2023

Date of Report: 02/09/23
Date of sample receipt: 26/08/2023
Test completion Date: 02/09/23

Name & Address of Client	M/s. ANDRITZ HYDRO PVT. LTD., LKHEP PROJECT,, village- longku, Dist- Dima Hasao, Pin-788931					
Sample Description	Type: Surface Water (Valve House)				Source: Kopili River	
Sample collected by	M/s. En-vision Enviro Technologies North East					
Sample Collection Particulars	Date 25/08/2023	Time 10:45 A.M	Temperature 30°C	pH 6.71	Quantity Drawn:2L	Sampling Method: EETNE/SOP/02

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
1	pH	---	6.62	APHA 23rd Edition,4500 H+,Page:4-95	6.5-8.5
2	Turbidity	NTU	1.26	APHA 23rd Edition,2130,Page:2-13	5
3	TDS	mg/L	203	APHA 23rd Edition,2540 C, Page :2-69	2000
4	TSS	mg/L	92.4	APHA 23rd Edition,2540,Page:2-70	------ -----
5	Oil and Grease	mg/L	<5	APHA 23rd Edition,5520 B,Page:5-42	------ -----
6	Dissolved Oxygen	mg/L	5.4	APHA 23rd Edition,4500-O C,Page:4-146	6
7	Total hardness	mg/L	53	APHA 23rd Edition,2340 B,Page:2-48	600
8	Calcium	mg/L	27.2	APHA 23rd Edition,3500-Ca B,Page:3-69	200
9	Magnesium	mg/L	16.5	APHA 23rd Edition,3500-Mg B,Page:3-86	100
10	Total Alkalinity	mg/L	162	APHA 23rd Edition,2320,Page:2-37	600
11	Sulphate	mg/L	11.6	APHA 23rd Edition,4500-SO_4^{2-}E,Page:4-199	400
12	Nitrates	mg/L	6.4	APHA 23rd Edition,4500-NO_3^-B,Page:4-127	------ -----
13	Phosphate	mg/L	<0.02	APHA 23rd Edition,4500-P,Page:4-163	------ -----
14	Salinity	%	0.3	APHA 23rd Edition,2520B,Page:2-60	------ -----
15	Conductivity	µS/cm	220	APHA 23rd Edition,2520B,Page:2-60	2500

Sample ID No: EETNE/AUG/21/23 **Date of sample receipt: 19/07/2023**
Test Starting Date: 26/08/2023 **Test completion Date: 02/09/2023**

Sl No.	Parameters	Unit	Result	Reference Method	IS 10500:2012 Permissible Limit
16	Arsenic	mg/L	<0.001	APHA 23rd Edition,3114A,Page:3-36	------ -----
17	Iron(as Fe)	mg/L	0.94	APHA 23rd Edition,3500-Fe B,Page:3-80	------ -----
18	Total Coliform	MPN/100	3	APHA 23rd Edition,9222B,Page:9-81	Shall not be detectable in any 100 ml Sample
19	Fecal Coliform	MPN/100	Nil	APHA 23rd Edition,9222 D,Page:9-89	Shall not be detectable in any 100 ml Sample
20	BOD	mg/L	9	APHA 23rd Edition,5210B,Page:5-6	------ -----
21	COD	mg/L	24	APHA 23rd Edition,5220 b,Page:5-18	------ -----

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

For Envision Enviro Technologies North East, Guwahati

KHAIRUL ISLAM SHEIKH
Environmental Chemist
Test Done By

UTPAL BEZBARUAH
Technical Manager
Authorized Signatory

Soil Quality Analysis

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SOIL ANALYSIS REPORT

Rep.No: 230902_1503165_0 **Date: 25/08/23**

Name & Address of Client	**M/s. ANDRITZ HYDRO PVT. LTD., LKHEP Project ,village-Longku ,Dist- Dima Hasao, Pin- 788931.**
Sample Description	**NEAR VALVE HOUSE**
Date of Sampling	**20/08/23**
Sample collected by	**M/s. En-vision Enviro Technologies North East**

Sl No.	Soil Parameters	Unit	Result	Reference Method
1	**pH**	---	6.79	Potentiometric
2	**Soil type**	---	Silt highly organic clay	Hydrometer
	Permeability of soil	Cm/sec	1.1×10^{-6}	Constant head test method
	Sand	%	60.2	Hydrometer
	Clay	%	11.4	Hydrometer
	Silt	%	28.4	Hydrometer
3	**Nitrogen**	kg/ha	0.086	Alkaline $KMnO_4$
4	**Phosphorus**	mg/kg	13.5	Olsen method
5	**Potassium**	mg/Kg	14	NH_4-acetate extraction
6	**Electrical conductivity**	mS/cm	16	Conductivity Meter
7	**Water holding capacity**	%	22	Standard method
8	**Organic matter**	%	0.65	Titrimetric

Sl No.	Parameters	Unit	Result	Reference Method
9	Organic Carbon	%	4.19	Rapid Dichromate Oxidation Technique
10	Iron	g/kg	83.5	Flame AAS(mg/kg)
11	Copper	mg/kg	6.2	Flame AAS
12	Nickel	mg/kg	3.7	Flame AAS
13	Manganese	g/kg	63.12	Flame AAS(mg/kg)
14	Zinc	mg/kg	0.87	Flame AAS
15	Arsenic	mg/kg	0.003	HG- AAS
16	Cadmium	mg/kg	<0.001	Flame AAS
17	Lead	mg/kg	0.002	Flame AAS
18	Chromium	mg/kg	<0.001	Flameless AAS
19	Aluminum	mg/kg	BDL	Flameless AAS

For En-vision Enviro Technologies North East, Guwahati

UTPAL BEZBARUAH
(Technical Manager)
Authorised Signatory

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SOIL ANALYSIS REPORT

Rep.No: 230902_1503164_0 **Date: 25/08/23**

Name & Address of Client	**M/s. ANDRITZ HYDRO PVT. LTD., LKHEP Project ,village-Longku ,Dist- Dima Hasao, Pin- 788931.**
Sample Description	**NEAR SERVICE BAY**
Date of Sampling	**20/08/23**
Sample collected by	**M/s. En-vision Enviro Technologies North East**

Sl No.	Soil Parameters	Unit	Result	Reference Method
1	p^H	---	6.93	Potentiometric
2	**Soil type**	---	Silt highly organic clay	Hydrometer
	Permeability of soil	Cm/sec	1.1×10^{-6}	Constant head test method
	Sand	%	67.3	Hydrometer
	Clay	%	9.4	Hydrometer
	Silt	%	23.3	Hydrometer
3	**Nitrogen**	kg/ha	0.072	Alkaline $KMnO_4$
4	**Phosphorus**	mg/kg	11.4	Olsen method
5	**Potassium**	mg/Kg	14.6	NH_4-acetate extraction
6	**Electrical conductivity**	mS/cm	12	Conductivity Meter
7	**Water holding capacity**	%	18.4	Standard method
8	**Organic matter**	%	0.67	Titrimetric

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Sl No.	Parameters	Unit	Result	Reference Method
9	Organic Carbon	%	4.14	Rapid Dichromate Oxidatio Technique
10	Iron	g/kg	88.6	Flame AAS(mg/kg)
11	Copper	mg/kg	5.8	Flame AAS
12	Nickel	mg/kg	3.4	Flame AAS
13	Manganese	g/kg	78.6	Flame AAS(mg/kg)
14	Zinc	mg/kg	11.2	Flame AAS
15	Arsenic	mg/kg	6.2	HG- AAS
16	Cadmium	mg/kg	0.01	Flame AAS
17	Lead	mg/kg	0.03	Flame AAS
18	Chromium	mg/kg	<0.02	Flameless AAS
19	Aluminum	mg/kg	BDL	Flameless AAS

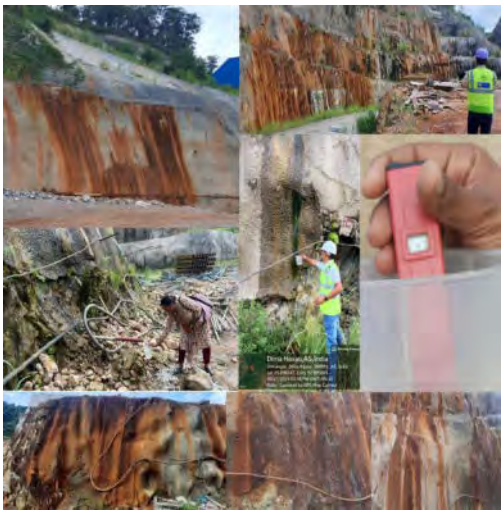
For En-vision Enviro Technologies North East, Guwahati

UTPAL BEZBARUAH
(Technical Manager)
Authorised Signatory

Water Quality Note

Recommended suitable measures for neutralizing or treating low pH water draining out of weep holes and tunnels before it reaches to river KOPILI

To ensure the proper neutralization and treatment of low pH water emanating from weep holes and tunnels before its discharge into the river KOPILI, a paramount focus is placed on adopting measures that marry efficiency with environmental responsibility. A comprehensive site visit was carried out in the month of September, during which a thorough survey of the entire project area encompassing weep holes drainage was diligently conducted. After a thorough site visit and pH assessment, opting for a phytoremediation process seems prudent for neutralizing the low pH in the drained water from weep holes. This is the eco-friendly approach that does not involve harmful chemicals. Microalgae consume pollutants and release oxygen, contributing positively to the surrounding environment.



In consideration of the project area's specific constraints related to limited working forest areas, regulatory compliances and a thorough desk review analysing the pros and cons of various water treatment options, Phycoremediation utilizing Micro Algae Consortia (Specific aquatic plants known for their ability to absorb and metabolize acidic components. Examples include water hyacinth, duckweed, and cattails. These plants can be placed in designated areas to help treat the water effectively) has emerged as the most suitable technology for treating low pH water. Additionally, it's noteworthy that the Meghalaya Pollution Control Board is already successfully employing this technology to treat acidic waters in rivers like Kyrhukhla and Lunar, as well as the Mookympad side stream. This highlights its proven efficacy and applicability to the project's context.

Comparative advantages of Conventional technologies Vs Phycoremediation

PARAMETER	STP / ETP/ WTP	PHYCO-REMEDIATION (ALGAE BASED)	ADVANTAGE OF PHYCO / ALGAE
CAPITAL COST	Rs. 2-2.5 Cr/MLD (Incl. Land)	Less than 70% of STP/CETP	SAVING OF CAPITAL COST by 70 %
OPERATING COST	Rs. 9-10 /KLD	Rs. 5-6 /KLD	About 50% REDUCTION
TIME TO SET UP	20-24 Months	1-3 Months	FASTER OPERATION
COST OF ENERGY	50-60 % of operating cost	5% of operating cost	Almost NEGLIGIBLE ENERGY COST
ENERGY USED	Electricity	Sunlight	NO COST AS SUN ENERGY IS FREE BY NATURE
USE OF TOXIC CHEMICALS	Part of technology Carcinogenic Tech	No toxic chemicals used Completely Organic	NO CARICINOGENIC MATERIAL USED
EXTERNAL BACTERIA	Yes	Only symbiotical bacteria - SAFE	SAFER
pH	Difficult to remove if on extreme side	Algae can work from extreme Acidic to Basic (1-14)	STABILIZATION ON WIDE RANGE
BOD	>90 %	> 90%	SIMILAR
COD/E-COLI ETC	> 90%	> 95 %	REDUCTION BETTER THAN STP
NITRATE	Not possible to remove	UP TO 80%	VERY EFFECTIVE IN NITRATE REMOVAL
SLUDGE REMOVAL	Not possible to remove	UP TO 80%	EFFECTIVE IN REMOVAL OF SLUDGE
SUSTAINABLE	No	YES	HIGHLY SUSTAINABLE
HEAVY METALS	No Reduction	Removes more than 70-80%	HIGHLY EFFECTIVE
NATURAL FOOD CHAIN	No	Sets natural food chain	ONLY THIS TECHNOLOGY CAN DO IT
HARDNESS	Cannot Remove	Can remove hardness by 70%	CALCIUM CARBONATE CAN BE BROKEN BY ALGAE
INCREASE IN DISSOLVED OXYGEN	Not very effective	Highly effective	PROMOTE BIO-LIFE
FERTILE WATER AND SLUDGE	No	Highly Fertile for bio fertilizer	SHALL HELP IN IMPROVING HEALTH OF AGRICUTURAL LAND AND ORGANIC VEGETABLES & CEREALS

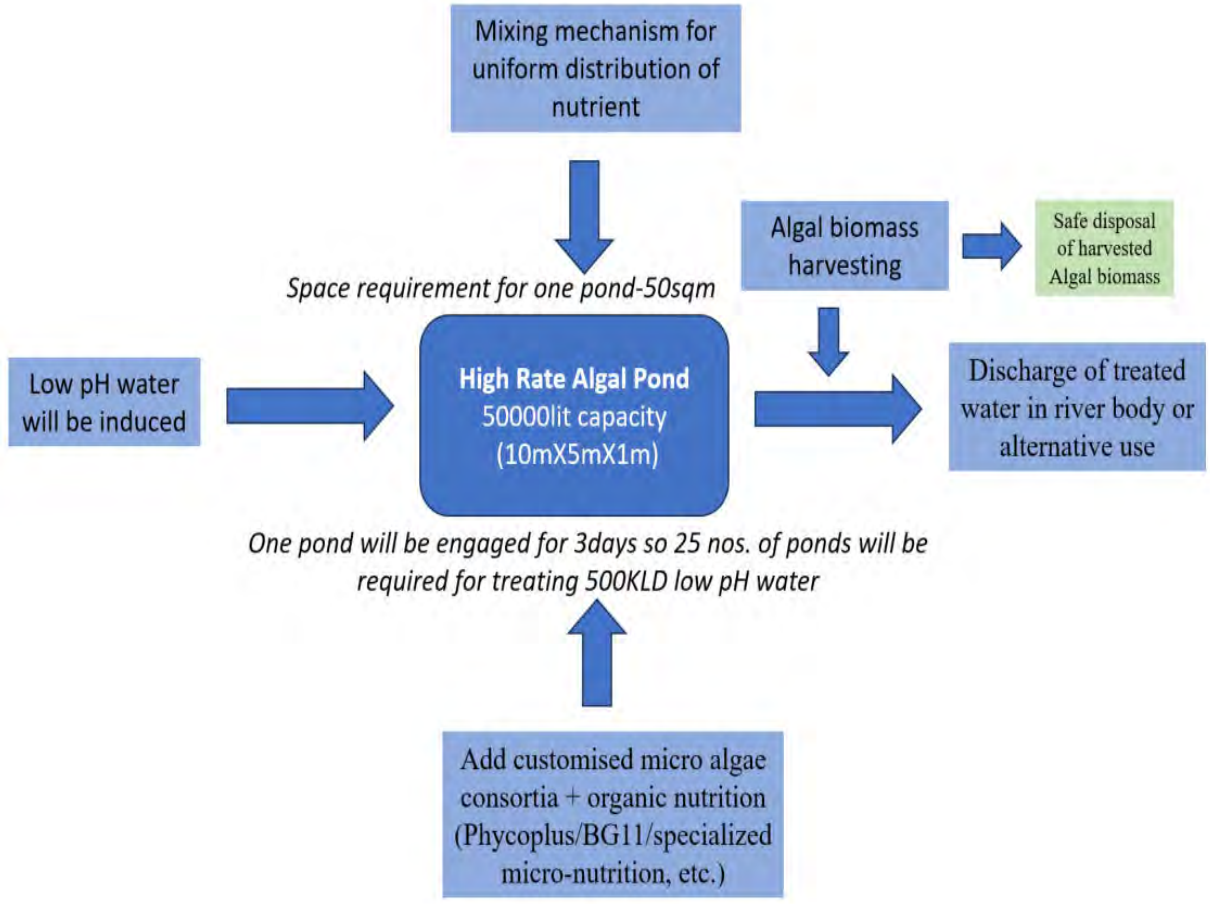
Methodology to treat low pH water

Considering the necessity to treat a peak volume of 500,000 liters per day (500KLD) of low pH water efficiently, High-Rate Algal Ponds (HRAP) are deemed appropriate. HRAPs are characterized by their shallow design, typically 1 to 1.5 meters in depth, and an optimal surface area to volume ratio, ensuring effective sunlight penetration and maximizing algae growth.

To accommodate the treatment of 500KLD, a strategic layout involving 25 ponds is proposed. Each pond will have a capacity of 50,000 liters (dimensions: 10m x 5m x 1m). These ponds can be constructed utilizing bamboo/concrete structure for a sustainable approach.

The operational strategy entails a rotational cycle, utilizing each pond for a duration of 3 days before cycling to the next. Low pH water will be pumped into these ponds, and the algal consortium within will work to elevate the pH as they grow. Upon completion of the treatment process, the water, now adequately treated, will undergo algal biomass harvesting. Subsequently, the treated water will be safely discharged into the river, aligning with the requisite environmental standards and regulations.

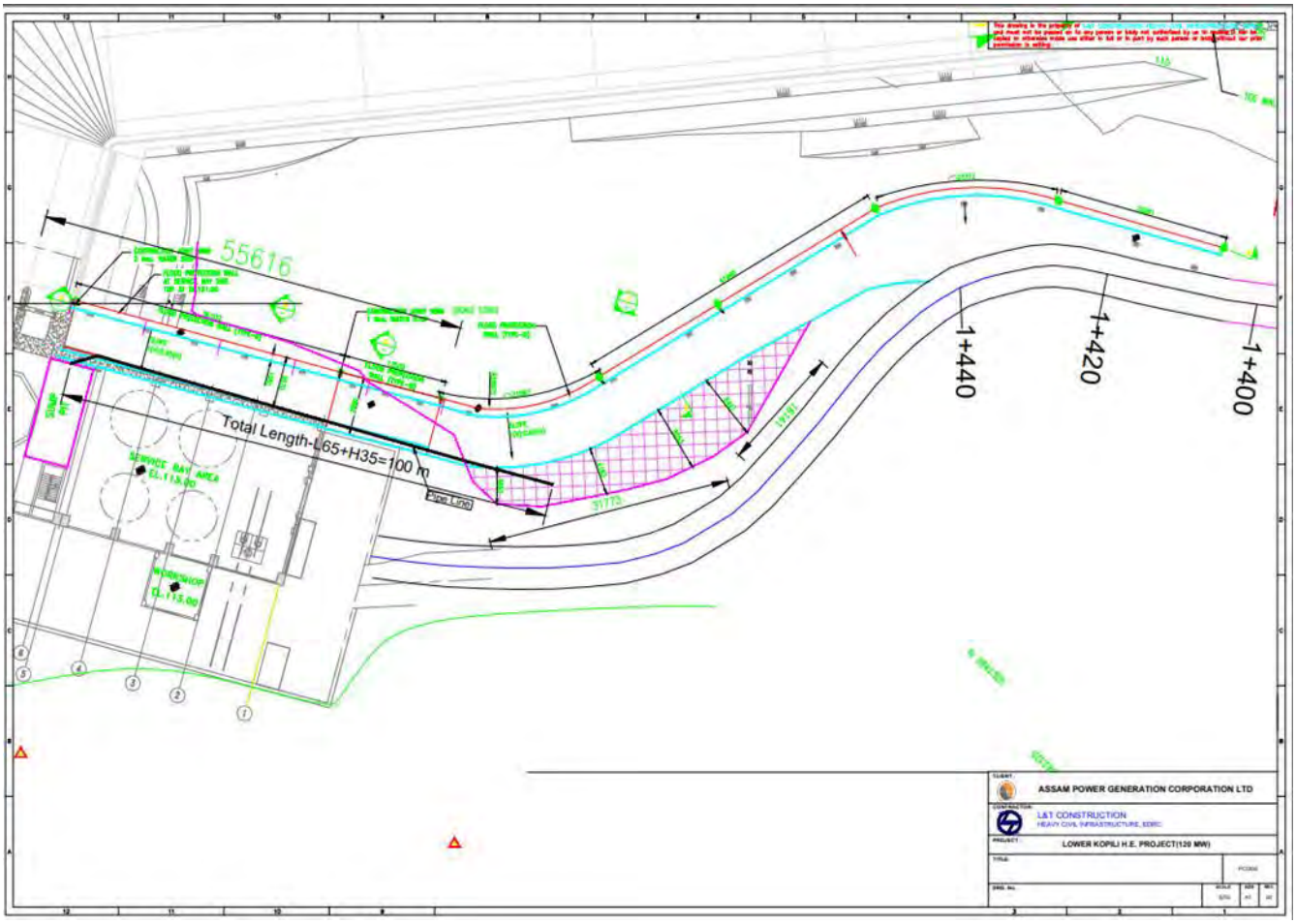
Schematic diagram for Phycoremediation



Steps for Treatment:

1) A storage area for collecting low pH water from weep holes will be created in available space near sump or in HRAP itself. (Shallow, open-air HRAPs designed to cultivate microalgae. These ponds will have a large surface area 10mX5m and 1-1.2m deep to maximize sunlight exposure and algae growth). A single pond having 50000 lit capacities (10mX5mX1-1.2m) will be engaged for 3days. The size can be increased based on the availability of space. Here in layout map of power house,300sqm area is demarcated as available space. And for pumping stored water near sump to this place one pump with 100m length of pipeline will be required. Other available space can also be opted based on the availability and gravity flow of drained water from weep holes.
2) Add customised micro algae consortia + organic nutrition (Phycoplus/BG11/specialized micro-nutrition, etc.) + sun light to produce large quantity of algae. The microalgae in the HRAPs absorb and utilize the nutrients present in the low pH water (such as nitrogen, phosphorus, and other pollutants), aiding in the remediation process. (Green algae like Chlorella, Spirulina, or other acid-tolerant microalgae can be used)
3) Provisioning of Mixing mechanisms such as paddlewheels or pumps to ensure uniform distribution of nutrients and prevent settling of algae at the bottom of the ponds.

4) A harvesting system, which can involve scraping or skimming, will be used to efficiently collect the cultivated algae from the ponds.
5) Safe disposal of the biomass to avoid the release of the absorbed or adsorbed metals back into their source when the plant dies and decompose (can be composted with other organic materials to create nutrient rich compost/soil enhancer/can be used as biofertilizer after testing).
6) Continuous monitoring the water quality parameters, including pH, metal concentrations, and other relevant parameters, to assess the effectiveness of phycoremediation. Based on monitoring results, the algal cultivation parameters can be adjusted, such as nutrient dosage, algae species, and retention time, to optimize the treatment process and improve efficiency.
7) The treated water, now improved in pH and will be discharged in water body or can be alternatively used.



Given the current availability of a 300sqm area within project site, the budget has been carefully planned to align with this space. The project can commence within this available area. However, as additional land becomes available in the future, there is potential to expand both the number of tanks and the overall procedure involved.

The initial budget and plan have been tailored to the existing space, ensuring efficient utilization and optimal functionality within the constraints. This strategy allows for a flexible approach, enabling the project to adapt and grow with the availability of more land.

<u>Cost Considerations</u> – The estimated cost for treating 1,20,000 liters (120KLD) of low pH water over a span of 3 years using 6 ponds within the available 300sqm area is set at Rs. 1,92,50,000 (One Crore Ninety-Two Lakh Fifty Thousand only).

Treatment Facility	**Units(s)**	**Cost (in INR)**
Dug out tanks made by concrete for Algae size 10mX5mX1m depth	6 If size of pond will be increased no. of ponds will be decreased	**Rs. 60,00,000** (If no. of ponds will be increased to 25 as per requirement of treating 500KLD low pH water then the expenditure will be increased with increase in all component up to Rs. 1,70,00,000)
LED-Plant based growth lights	6	
GPS based pH + TDS meter	7	
Temperature controller GH covers for tanks	6	
CCTV set up for monitoring of the sites and data backup system	1	
Motor pump-3HP single phase	18	
Piping	1	
Sand filters to filtration	2	
Travelling screen for removal and collection of biomass	3	
On site small lab/testing equipment	1	
Nutrition for the growth of Algae and designing the innoculum		
Phycolpus Nutrition (all natural recommended by CPCB)		**Rs. 32,50,000** (For requirement of 25 nos of tanks expenditure will be Rs.1,30,00,000)
Micro Nutrition		
Gibberellic acid-Algae growth nutrition-Plant growth harmone		
Designing the inoculum		
Manpower	7 @3yrs	**Rs.50,00,000**

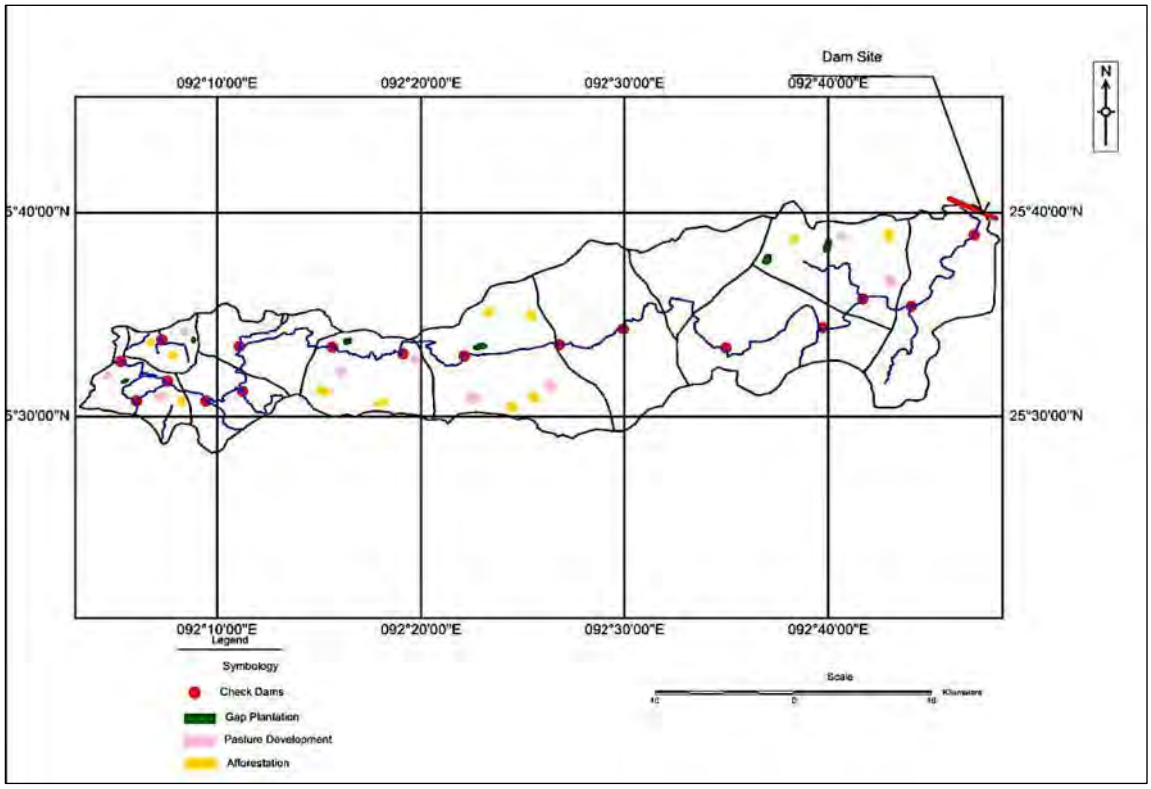
Contingency (pump for lifting water and pipeline 400dia)		**Rs. 50,00,000**
TOTAL EXPENDITURE FOR TREATING 120KLD (1,20,000 lit) IN AVAILABLE SAPCE OF 300SQM FOR 3 YRS WITH 6 NO. OF PONDS		**Rs. 1,92,50,000 for 3yrs with 6no. of ponds with treating capacity of 1,20,000 lit (120KLD)**
TOTAL EXPENDITURE FOR TREATING 500KLD OF LOW PH WATER FOR 3YRS		**40,000,000 for 3yrs**
Client responsibility		
All necessary permissions if required		

Note- Cost may vary depending on size and number of ponds and off course quantity of water to be treated.

Annexure- V

Catchment Area Treatment Measures for Lower Kopili Catchment

Land Bank Map of CAT Plan



Annexure- VI

CAT plan implementation by Forest Department

By e-mail

GOVERNMENT OF ASSAM
OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS &
HEAD OF FOREST FORCE, ASSAM
ARANYA BHAWAN, PANJABARI :: GUWAHATI-781037
E-mail statecampaassam@gmail.com

No.FG.27/CAMPA/CA Pltn/2022-23 Dated Guwahati, 11th Oct, 2023

To,

The Project Director (PMU),
Assam Power Generation Corporation Limited,
Bijulee Bhawan, 3rd Floor, Paltanbazar, Guwahati-781001

Sub: Implementation of CAT Plan, SMC Plan and CA Plantation programme for 120 MW Lower Kopili Hydro Electric Project, - reg.

Ref: Your letter no.APGCL/CGM(H)/W/2007/140/Pt-VI/77 dated 21.09.2023.

Sir,

With reference to the above, I am to inform you that the activities of Catchment Area Treatment Plan & Soil & Moisture Conservation Plan drive for Lower Kopili Hydro Electric Project (120 MW) have not been implemented till now as the same are likely to be included in the APO of 2024-25. However, the programme for the Compensatory Afforestation (CA) plantation activities are started by raising of site nurseries near by the approved 8 (eight) CA sites and plantation activities are going on under APO 2023-24 in Hamren & Dima Hasao (West) Forest Division.

Yours faithfully,

(Dr. Satyendra Singh, IFS)
Addl. Principal Chief Conservator of Forests &
Chief Executive Officer, State CAMPA, Assam
Aranya Bhawan, Panjabari, Guwahati – 37

Copy to:

1. The Principal Secretary, Department of Power, Govt. of Assam, Block-C, Ground Floor, Janata Bhwan, Guwahati-6.
2. The Principal Secretary, Department of Environment & Forest, Govt. of Assam, Janata Bhwan, Guwahati-6.
3. The Chief Conservator of Forests & Nodal Officer (F.C Act), Aranya Bhawan, Panabari
4. The Chairman, APGCL.
5. The Managing Director, APGCL.

Addl. Principal Chief Conservator of Forests &
Chief Executive Officer, State CAMPA, Assam
Aranya Bhawan, Panjabari, Guwahati – 37

STOP CHILD LABOUR

सत्यमेव जयते

FORM-VIII
[See Rule-11(1)]
GOVERNMENT OF ASSAM
LO Office(Haflong)

LICENCE OF CON TRACTOR FOR EMPLOYMENT OF MIGRANT WORKMEN UNDER INTERSTATE MIGRANT WORKMEN (RE & CS) ACT, 1979

UBIN	:	299850130/NOPAN/8/2023
UAIN	:	COLFORMV/2023/00031
Original Registration No.	:	CLL/2023/YV1891681217100PD
Licence No.	:	MGW(E)/2023/OS1695828148894SH
Date of Issue	:	25/09/2023

1. Licence is hereby granted to **MKS ENGINEERING COMPANY** under Section 8(1) of the Inter-State Migrant Workman (Regulation of Employment and Condition of Service) Act,1979 subject to the conditions specified in the Annexure.

2. The Licence is for doing the work of **Service and Manufacturing** , in the Establishment of **CHIEF GENERAL MANAGER PP and I APGCL** at **PALTANBAZAR GUWAHATI KAMRUP METRO 781001 ASSAM**

3. No. of migrant workers to be engaged **30 nos.**

4. The License shall remain in force till **24/09/2024** .

5. Payment Details:

GRN AS003727768202324P
CIN 10004672023092502492
Txn Date 25/09/2023
Amount 9050.00
Status Y

LO Office(Haflong)
Licensing Officer

(Scan the QR Code for authentification)

*** This is a computer generated certificate and it does not require a Signature/Seal ***
***Terms & Conditions of this Certificate is enclosed as Annexure-I ***

STOP CHILD LABOUR

Annexure- VIII: Key Observations Site Visit Observations July and September 2023

Construction Drawings and other Design Elements
The construction drawings prepared by Tractebel have not been received by the EMC yet. Some volumes containing the drawings that have already been prepared were shown during the meetings confirming that adequate detail of the construction is being considered. A master document list where all the drawing concerning the dam are identified is also important. L&T explained that not all drawings are ready yet and delivered an "Engineering Design Schedule of Balance Dam Submission". The "Design Basis Report" – O20318-BE-DBR-STR-001 is an important document, where the approved design criteria are summarized. An updated construction schedule should always be available, specially before site visits, in order to prepare them properly.
Dam Stability
Tractebel and L&T teams described main criteria considered in dam stability analysis: • Design Earthquake parameters both for MCE and DBE have been determined by the Indian Institute of Technology Roorke, • stability analysis has been done for loads and combinations as defined in US-6512, including non-operating drainage curtain, • detailed thermal studies for mass concrete have been developed by L&T (Doc. No - O20318-DD-DAM-STR-0021), providing alternatives for placement temperature of concrete with respect to lift thicknesses, time interval between successive lifts, requirement of cooling, including Zones 1 and 2 (Zone 2 - concrete on foundation rock) which are described separately. Aspects related to negative slope of the foundation, to increase resistant forces, and thermal studies including operation phase of the dam were referred by dam safety expert, as well as the shear keys between blocks.
Dam Monitoring
L&T showed the drawings where instrumentation and dam surveillance devices are defined. Concerning the dam and its foundation, monitoring frequency and expected values ranges are not defined in these drawings. L&T referred that the monitoring frequency is the one indicated in the Terms of Reference (Section 6 – Employer's Requirements, Chapter 6.19 – Instrumentation).

The dam safety procedures related with the First filling of the reservoir should be prepared and programmed, including a detailed monitoring of actions and site inspections and surveillance.
EMC Dam Safety Experts referred their concern about the fixed point for surface settlement points which is planned to be placed on the right abutment, where a slope instability happened.

Operation and Maintenance Rules

Tractebel confirmed they were developing operating rules for appurtenant works of the dam and that the hydromechanical equipment supplier would develop specific rules for the equipment's operation and maintenance.
It was referred that it is important that APGCL receives an integrated document referring civil works and equipment, as well as operation and preventive maintenance. This document should also consider the operation of upstream dams (considering a cascade operation rational, instead of LKHEP solely).

Concrete resistant to acid water

As the water quality measured at dam site and its upstream and downstream parts has shown low pH values, dam concrete in contact with river water must be resistant to acids as all involved parties are well aware.
The main construction provisions considered by the Civil Works Contractor are as follows:

- Cement admixture with acid water protection on the faces in contact with water (testing plant has been done on site);
- Galvanisation of reinforcement bars;
- Concrete cover thickness of 10 cm.

Slope Instability on right abutment

The slope instability that has occurred at the higher levels of the right abutment has meanwhile been cleaned up.
Foundation level of the blocks adjacent to the right abutment Block 20 has been gone deeper, in order to find adequate rock foundation characteristics. Specifically concerning Block 18, the results of the pressure meter tests for acceptance of the deeper foundation level are pending. After acceptance of this test result, GSI will perform geological mapping of the blocks where it is still missing, before covering the rock foundation.
Downstream the dam, where this slope is behind and near to the auxiliary powerhouse, an adequate treatment of the slope shall be performed. L&T together with Tractebel are analyzing possible containing measures, to be designed and proposed to APGCL. A brief presentation of these measures, consisting of an injection curtain and piles with prestressed anchors has been performed by L&T during second day's meeting.

Reservoir slopes' stability

Attention was drawn to the need to carry out an analysis of the possibility of slope instabilities in the reservoir due to impounding, which L&T and Tractebel said they were planning to do.

Dam break analysis and Emergency Action Plan
Dam break analysis has been prepared within the scope of the EIA (Annex 30), but the results included in this annex are very short and do not allow a consistent and comprehensive analysis. EMC recommended that a detailed study must be performed, including the flood wave routing with state-of-the art modelling approaches and inundation mapping preparation. These inputs are crucial for disaster management. According to APGCL, a detailed study of dam failure is being performed by Wapcos. Additionally, the EMC referred to the importance of analyzing the failure of the upstream dams (Khandong Dam and Umrong Dam) as a possible cause of the dam, as well as establishing the plans identifying the submerged areas in case of rupture and the affected construction and infrastructures. Concerning Emergency Action Plan, no information was given if there are studies going on.
Dam Stability
Tractebel and L&T teams described main criteria considered in dam stability analysis: Design Earthquake parameters both for MCE and DBE have been determined by the Indian Institute of Technology Roorke, stability analysis has been done for loads and combinations as defined in US-6512, including non-operating drainage curtain, detailed thermal studies for mass concrete have been developed by L&T (Doc. No - O20318-DD-DAM-STR-0021), providing alternatives for placement temperature of concrete with respect to lift thicknesses, time interval between successive lifts, requirement of cooling, including Zones 1 and 2 (Zone 2 - concrete on foundation rock) which are described separately. Aspects related to negative slope of the foundation, to increase resistant forces, and thermal studies including operation phase of the dam were referred by dam safety expert, as well as the shear keys between blocks.
Workshop on Dam Safety
The workshop on Dam Safety was held on Friday, the 21st of July on site, in the APGCL's installations (on site). The program of the workshop is presented below. More than 65 participants took part in the workshop, and interesting discussion of the different themes has taken place during the sessions. The attendance sheets are included in Annexure 1. The presentations of Part 1: Introduction to Dam Safety & Its Need and Part 2 Integration of Dam Safety, inspection, monitoring, and maintenance.

Workshop on Dam Safety
Timing: - 11:30 – 16:30 / 21st July 2023
Venue: Panimur, Dima Hasao

Timings	Programme
11:30 - 11:40	Welcome address by **Mr. Saumyasib Mukhopadhyay (TL, EMC)** along with Introduction of the Project.
11:40 - 11:45	Workshop Objective by **CGM (PP&I), APGCL.**
11:45 -12:00	Keynote Address by Special Invitees of APGCL.
12:00 – 12:05	Investment in Power Sector in North East India: **ADB Member**
12:05 - 12:10	Project Brief & Safeguards:120MW LKHEP by **Project Manager, L&T.**
12:10 – 13:30	Introduction to Dam Safety & Its Need by **Ms. Ana Quintela and Mr. Miguel Silva**
13:30 -14.30	LUNCH BREAK
14:30 -15:30	Integration of Dam Safety, Inspection, Monitoring and Maintenance by **Ms. Ana Quintela** and **Mr. Miguel Silva**
15:30 – 16:00	Study Drone in the LKHEP and Dam Safety Measures taken PMC and address by other experts, EMC.
16:00 -16:30	Knowledge sharing and Discussion.
16:30 – 16:35	Vote of Thanks by **TL, EMC.**

The minutes of meeting for the Dam Safety workshop is already shared with APGCL.

Dam Safety Workshop in Progress.

Aquatic Ecology

- Small fingerlings of fishes were observed in upstream waters.

- During meeting with DFO he mentioned that there are no records of Ganges River dolphin in area of influence of the project. Preliminary literature survey also found that the same. However, Presence of *Tor putitora.*(Golden Mahaseer) *Neolissochilus hexagonolepis* (common chocolate mahseer) are important fish species that could survive in the water once water pH reach to normalcy.
- Central Inland Water Dept. was visited and issue regarding presence of Ganges River Dolphin in the Kopili River was discussed. Surveyor has confirmed that the said Department has not surveyed any waterways near LKHP site.
- A detailed literature study was also submitted to APGCL by EMC indicating no possibility of presence of Dolphin in the river.
- Low pH levels in the Kopili River were found to hinder aquatic life, and no endangered species were identified. However, four sites were deemed Critical Areas due to the presence of healthy aquatic flora and fauna, suggesting the need for a specialized biodiversity management plan.

Vehicle Wash Wastewater

It has been noted that a substantial amount of water is being used during vehicle washing, and the waste water generated through the activity is directly discharged into the local drains without any treatment. Wash water from vehicle or equipment cleaning activities may contain petroleum hydrocarbon wastes (petrol, diesel, grease, and motor oil), detergents, dirt, and heavy metals. went into the local drains without any treatment. Wash water from vehicle or equipment cleaning activities may contain petroleum hydrocarbon wastes (petrol, diesel, grease, and motor oil), detergents, dirt, and heavy metals.

The provision of a catch basin for collecting oil and sediment is recommended as a potential solution for treating effluent from car washes.

Vehicle wash and maintenance facility by package 2 contractor

Outstanding Permissions for Vehicle Registered in Bhutan

As asked repeatedly by EMC, all vehicles registered in Bhutan must be registered with Indian numbers, and a PUC must be obtained. APGCL committed to resolving the issue by the end of July 22, and a letter

was also issued to the package 2 contractor requesting that they register all of their vehicles in India in addition to the PUC. However, this issue has not been resolved.

The vehicles from neighbouring countries are allowed into India, subject to RTO permissions. However, as per Article VI of the Motor Vehicles Agreement for the Regulation of Passenger, Personal, and Cargo Vehicular Traffic between Bangladesh, Bhutan, India, and Nepal, the validity of the permission seems to be only 1 month. Further, there are restrictions such as:

"*Vehicles registered in one Contracting Party and operating under this Agreement will not be permitted to transport local passengers and goods within the territory of other Contracting Party(ies).*

No major repair work will be carried out in another Contracting Party except in the event of an accident or breakdown.

In the case of accidents, all consequential repairs may also be permitted in the Contracting Party where the accident occurred, and the legal proceedings, if any, against the driver of the vehicle will be disposed of expeditiously under the relevant laws of the Contracting Party where the accident occurred."

Vehicles with Bhutanese Number Plate

Excavated soil is stored uncovered on the site

Excavated soil from the construction could easily be washed away and pollute local water bodies. Therefore, excavated soil should be graded according to soil type and stored separately. Heaps of soil should be covered with geotextile/grasses/vegetation.

Exposed Top Soil CP1

Integrated water resource management

As intimated by APGCl, RMSI under Japan Fund for Poverty Reduction (JFPR) grant has initiated the downstream study under Integrated water resource management.

Sanitary Facilities

At the package 1 contractor's labour camp, there was no separate bathing and washing area, and the toilet required water fixtures. The septic tank for the toilets was without a soak pit.

The package 1 contractor is required to maintain restrooms in a sanitary condition. All sanitary and toilet facilities should maintain the availability of adequate water, adequate lighting, and proper cleaning with an adequate number of bathing and urinal units. They must be kept in working condition and cleaned frequently. To safely release the wastewater into the environment, a soak pit is needed. Moreover, it helps replenish the groundwater table.

Toilets and Septic tank Package 1 Contractor's Labour Camp

Fire Extinguishers

During the site review, it was observed that fire extinguishers placed at CP1 labour camp were not being audited for service and maintenance checks.

No fire extinguishers were observed at CP4 labour camp and CP1 construction site.

Fire Extinguishers at CP1 labour camp and construction site

Fire Extinguishers at CP4 storage yard

Capacity Building and Training

As asked repeatedly by EMC, all personnel/employees and workers (of all contractors) at the project site are required to undergo:

- Social and HIV/AIDS awareness trainings
- Prevention of Sexual Harassment at Workplace (POSH)
- Awareness on labour laws-related trainings
- Understanding of local customs, culture and traditions.
- EHS training covering events of encounter with wild animal and medical emergencies on snake and insect bite event.

Inclusive of above package 1 contractor is required to undertake mock drills and training in the EHS related trainings for construction safety, life and fire safety, electrical safety etc.

Observation on labour camps

- Workers at Package 1 Contractor were observed without proper PPE.
- There is no provision for first aid at the labour camp of both the contractors.

- Firefighting arrangements were not observed at the labour camp of CP4 while at CP 1 labour camp arrangements were inadequate.
- Workers in the community kitchen provided by CP1, CP3 and CP4 were observed to have been using firewood for cooking.
- Drinking water is provided from the bore well on site and stored in unkempt tanks.
- As reported by site representatives, medical check-ups of new labourers are not undertaken by the CP1 prior to recruitment. Therefore, there is no baseline for their medical status before moving into the labour camp. This poses a risk of communicable diseases in the community.
- Labours were observed residing at CP1 construction site.

Usage of Firewood for Cooking at CP1, CP3 and CP4

Unsafe drinking water at CP1

Lose wires at CP 1 construction site

Workers at CP 1

Workers at CP 1 without PPEs

It needs to ensure that EHS protocols are strictly followed by the CP 1 and CP 4.

- Formulate a legal register to regularly check and update their licences and other regulatory requirements.
- There should be necessary provision for first aid in an easily accessible location at the construction site and labour camp, and the workers should be informed accordingly. Timely training for First aiders and other site staff should be provided, and all logs and records should be maintained properly.
- Adequate provisions for emergency fire services, including fire breaks, firefighting equipment, and water supplies, should be made for the construction works and the labour camp.
- The contractor is required to prepare an incident/accidental register record, which shall be maintained.
- The use of firewood for cooking should be stopped with immediate effect.
- Adequate supply of potable water both on site and in labour camps. The water quality must be monitored regularly. Drinking water should be tested for IS:10500-2012 parameters.

Grievance Redressal Mechanism

All contractors are required to disclose its Grievance Redressal Mechanism to receive and resolve the concerns and grievances of the affected communities and workers at the site. All formal and informal complaints, requests, and grievances should be recorded, and adequate closure should be provided. Post-closure, the complainant should be adequately informed.

APGCL is expected to ensure monthly dialogue with the affected community and stakeholders to discuss the project in order to comprehend any concerns regarding the health issues faced by the villagers and address issues related to them.

GRC meetings with local representatives should be held every quarter. The respective contractors must include the meeting's conclusions in the Monthly Environment Report (MER).

Snippets of The Site Visit

Kopili Seepage water nearthe Tail Race Tunnel and Power House.

Sample from the point just beneath E-130at Power House near the side way

Batching Plant area -Sedimentation tank requires improvement

Labor & staff colony – Test report is asked for discharged water

Toilet facility at CP4 storage yard

RO facility installed at CP3

Intake to the diversion tunnel

Downstream of the upstream concrete cofferdam

Left abutment and first layers of Blocks 6 to 10

General view of dam, cofferdams and left abutment

View of the downstream cofferdam with soils to improve impermeability

Final section of the diversion tunnel

Some of the participants in the workshop on Dam Safety

Meeting with Design Team (Tractebel) and Civil Works Contractor (L&T), at Tractebel office in Gurgaon

Dam Site

Annexure- X (Persons met and discussed)

With following persons, FIPL had discussions and interacted during this Site Visit

APGCL	PMC	L&T
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