सत्यमेव जयते

Government of India
Ministry of Environment, Forest and Climate Change
IA Division
(River Valley and Hydroelectric Projects)
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Minutes of 26TH MEETING OF THE EXPERT APPRAISAL COMMITTEE meeting River Valley and Hydroelectric Projects held from 12/03/2025 to 12/03/2025 **Date:** 24/03/2025

MoM ID: EC/MOM/EAC/672037/3/2025

Agenda ID: EC/AGENDA/EAC/672037/3/2025

Meeting Venue: N/A

Meeting Mode: Virtual

Date & Time:

12/03/2025	10:30 AM	05:30 PM

1. Opening remarks

The 26th meeting of the EAC for River Valley & Hydro-electric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 12th March, 2025 (Virtual Mode), under the Chairmanship of Prof. G. J. Chakrapani.

2. Confirmation of the minutes of previous meeting

The Minutes of the Meeting held on 25th EAC meeting on 27th February, 2025 were confirmed.

3. Details of proposals considered by the committee

Day 1 -12/03/2025

3.1. Agenda Item No 1:

3.1.1. Details of the proposal

Kamod Pumped Storage HEP by **Megha Engineering & infrastructures Limited** located at **NANDURBAR,MAHARASHTRA**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/MH/RIV/525456/2025	J-12011/09/2025-IA.I (R)	01/03/2025	River Valley/Irrigation projects (1(c))

3.1.2. Project Salient Features

26.1.1: The proposal is for grant of Terms of References (TOR) to the project for Kamod Close Loop Pumped Storage Hydro Electric Project (2000 MW) in an area of 395.23 Ha at Village Chaupale, Kamod, Lavhartodi, Kotkhamb and Nagziri, Sub District Sakri and Nawapur, District Dhule and Nandurbar, Maharashtra by M/s Megha Engineering & infrastructures Limited.

26.1.2: The Project Proponent and the accredited Consultant M/s. R S Envirolink Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

i. Kamod Pumped Storage Project is a closed loop pumped storage scheme with newly proposed upper and lower reservoir. The upper reservoir is lies on Lavhartodi Village, Sakari tehsil of Dhule district whereas lower reservoir lies over Kamod Village, Nawapur tehsil of Nandurbar district of Maharashtra. Both the locations are well connected with the road infrastructure. The Kamod Pumped Storage Project is proposed with a rating of 2000 MW and with a storage capacity of 12000 MWh. This Project comprises 7 units of 250 MW each and 2 units of 125 MW each.

ii. The installed capacity of a pumped storage scheme is influenced by the requirements of daily peaking power requirements, flexibility in efficient operation of units, storage available in the reservoirs and the area capacity characteristics. The Project will generate 2000 MW by utilizing a design discharge of 609.72 Cumec and rated head of 371.00m. The Kamod pumped storage Project will utilize 2200 MW to pump 13.22 MCM of water into the upper reservoir in 6.85 hours

iii. The geographical location of upper dam is Latitude 21°04’44.87”N, Longitude 73°57’6.42”E and for lower reservoir is Latitude 21°05’28.42”N, Longitude 73°56’24.46”E.

iv. Kamod Pumped Storage Project is a pumped storage scheme with an installed capacity of 2000 MW. The scheme of operation considered for the project is daily regulation to meet the demand of about 6 hours of peak power daily. Off-peak pumping hours are considered as 6.85 hours daily.

v. **Land requirement:** The total land requirement for proposed project is about 395.23 Ha, out of which 302.29 Ha is forest and about 92.94 Ha is non-forest land.

vi. **Demographic details in 10 km radius of project area :**

- There are two villages namely Kamod and Dapur located near the proposed project reservoir area, falling under the Nawapur and Sakri tehsils of Nandurbar and Dhule districts.
- Both villages have a predominantly tribal population, with the Bhil community comprising about 99% of the residents.
- Agriculture is the primary occupation in these villages. Due to limited irrigation infrastructure, farming largely depends on monsoons and rainwater. Commonly cultivated crops include millets, maize, and pulses.
- The Bhil community is known for its rich cultural heritage, often engaging in traditional dances, music, and festivals that celebrate their deep connection to nature.
- The project region, in particular, is home to unique Bhil dance forms and rituals that are integral to their cultural identity. These villages represent rural life in Maharashtra, showcasing communities deeply rooted in agriculture and rich cultural traditions.

Description		**Scheme -1**	**Scheme -2**	**Scheme -3**	**Scheme -4**	**Scheme -5**	**Scheme -6**
Lower Reservoir		LR-1	LR-2	LR-3	LR-4	LR-5	LR-6
FRL	EL	288.0	300.0	300.0	298.0	350.0	330.0
MD	EL	254.0	266.0	266.0	270.0	314.0	292.0

DL (Presently assumed deepest bed level)							
Gross Storage	MCM	17.49	17.6	18.6	15.15	16.4	18.3
Evaporation Loss	MCM	2.70	1.57	1.71	0.78	2.63	1.80
Live Storage	MCM	14.8	16.1	16.9	14.56	13.8	16.5
Upper Reservoir		UR-1	UR-2	UR-3	UR-4	UR-5	UR-6
FRL	EL	654.0	660.0	650.0	676.0	680.0	550.0
MDDL (Presently assumed deepest bed level)	EL	626.0	620.0	608.0	654.0	652.0	510.0
Gross Storage	MCM	14.8	45.8	20.0	15.53	16.6	18.8
Evaporation Loss	MCM	1.94	1.94	1.50	0.63	2.13	2.17
Live	MCM	12.8	43.9	18.5	14.37	14.5	16.6

Storage							
Required Power	MW	2000	2000	2000	2000	2000	2000
Rated Net Head	m	353.5	343.0	332.3	371	323.7	214.3
Discharge Requirement for given power & head	cumecs	648	668	689	609.72	708	1069
Live Storage required	MCM	14.0	14.4	14.9	13.22	15.3	23.1
Gross Storage Required	MCM	18.6	17.9	18.1	15.53	17.4	27.1
Summary							
Plant Capacity	MW	2000	2000	2000	2000	2000	2000
Generation Hours	Hrs	6	6	6	6	6	6

Total Design Discharge	cumec	648	668	689	609.72	708	1069
Total WCS Length	m	2750.0	3700.0	3400.0	1058.71	1800.0	1220.0
L/H		7.5	10.3	9.8	2.85	5.4	5.6
Rated Head	m	353.5	343.0	332.3	371.0	323.7	214.3
Land Requirement							
Total Land (Reservoir)	Ha	327.0	318.3	314.7	309.37	316.5	318.3
Upper reservoir Area	Ha	110.0	118.5	116.4	118.35	102.0	119.0
Lower reservoir Area	Ha	217.0	199.8	198.3	191.02	214.5	199.3
Forest Area	Ha	217.0	318.3	198.3	309.37	171.5	318.3
Private Land	Ha	110.0	0	116.4	0	145	0

Scheme is 4 is preferred and is the final selected alternative.

1. Project details:

Name of the Proposal	Kamod Close Loop Pumped Storage Hydro Electric Project
Location (Including coordinates)	Lower Reservoir : Longitude: 73° 56' 24.46" E; Latitude: 21° 05' 28.42" N Upper Reservoir : Longitude: 73° 57' 6.42" E; Latitude: 21° 04' 44.87" N
Inter- state issue involved	No
Seismic zone	Zone-III

2. Category details:

Category of the project	A
Provisions	
Capacity / Cultural command area (CCA)	2000 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	Nil

3. Electricity generation capacity:

Powerhouse Installed Capacity	2000 MW
Generation of Electricity Annually	4161 MU
No. of Units	9 nos. (7X250 MW+2X125 MW)
Additional information (if any)	Nil

4. ToR/EC Details:

Cost of project	10219.0 Cr.
Total area of Project	395.23 ha
Height of Dam from River Bed (EL)	Lower Dam – 48.0 m Upper Dam –48.0 m
Length of Tunnel/Channel	1058.71 m
Details of Submergence area	309.37 ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from l abour colony and construction waste

E-Flows for the Project	Not Applicable, as this is Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by b) EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

5. Muck Management Details:

No. of proposed disposal area/ (type of land- Forest/Pvt. land)	60 ha (Non-Forest Land)
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Land Area Breakup:

Private Land	92.94 ha
Government land/Forest Land	302.29 ha
Submergence area/Reservoir area	309.37 ha
Land required for project components	85.86 ha
Additional information (if any)	Nil

7. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Remarks**
Reserve Forest/Protected Forest Land	-	There is no Protected Area in the vicinity of the proposed project. Aner Dam WLS is approx. 112.0 km far from the proposed project area.
National Park	-	
Wildlife Sanctuary	-	

Court case details:

Court Case	Nil
Additional information (if any)	Nil

9. Miscellaneous

Particulars	**Details**
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization)

	Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : I(C) Address : 403, Bestech Chambers, Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Haryana - 122009 E-mail : ravi@rstechnologies.co.in Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	• Pumped storage hydropower is a modified use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	Forest Clearance - Online application seeking forest diversion for around 302.29 Ha after receipt of ToR Approval. Alongside, other statutory clearances (

	as applicable) from State as well as Central govern ment will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

3.1.3. Deliberations by the committee in previous meetings

N/A

3.1.4. Deliberations by the EAC in current meetings

26.1.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Kamod Close Loop Pumped Storage Hydro Electric Project (2000 MW) in an area of 395.23 Ha at Village Chaupale, Kamod, Lavhartodi, Kotkhamb and Nagziri, Sub District Sakri and Nawapur, District Dhule and Nandurbar, Maharashtra by M/s Megha Engineering & infrastructures Limited.

The project/activity falls under Category A of item 1(c), 'River Valley Projects,' as per the Schedule of the Environmental Impact Assessment Notification, 2006, and requires appraisal at the central level by the sectoral EAC in the Ministry.

The EAC observed that the total land requirement for the Kamod Pumped Storage Project is estimated at 395.23 Ha, out of which 302.29 Ha is forest and about 92.94 Ha is non-forest land. However, the application for Stage-I Forest Clearance (FC) has not yet been submitted, necessitating further action from the Project Proponent. There is no Protected Area in the vicinity of the proposed project.

The EAC also noted that the project boundary is outside ESA of Western Ghats and as per information available on Parivesh Gujrat state boundary is 6 km away from the project boundary.

The EAC further noted that the total water requirement for the project is 17.51 MCM for initial reservoir filling and thereafter ~ 2.84 MCM per year will be required from Rangawali dam reservoir for restoring the storage capacity lost due to evaporation.

The EAC observed that the project boundary lies outside the Ecologically Sensitive Area (ESA) of the Western Ghats and, as per information available on Parivesh, the Gujarat State boundary is approximately 6 km away from the project site. However, the Committee raised ecological concerns regarding the long-term sustainability of water resources for the project. The total water requirement for the project is 17.51 MCM for initial reservoir filling, followed by an annual requirement of approximately 2.84 MCM from the Rangawali Dam reservoir to compensate for evaporation losses. The EAC expressed concern that the availability of water in the Rangawali Dam and the estimated surplus water may not be sufficient to ensure the long-term feasibility of the project. The Committee recommended that a detailed study be undertaken by the PP to assess the hydrology of the area and evaluate water availability concerning project feasibility over the next 50 years.

During the meeting, the PP submitted that to assess water availability at Rangawali Dam, IMD data from 1973 to 2022 was analyzed. The data was used to estimate the average monthly and annual precipitation over the designated region. The EAC noted that the annual average rainfall is 699 mm, while the average monsoon rainfall (June–September) is 608.7 mm, which is significantly lower than the national annual average rainfall of India. Regarding water availability, the EAC further observed that the catchment area of the Rangawali Dam is 99.2 sq. km, with an estimated annual yield of 26.38 MCM during a 75% dependable year and 22.16 MCM during a 90% dependable year, against a live storage capacity of 12.89 MCM. The estimated surplus water during the monsoon is projected to be 13.49 MCM and 9.27 MCM

for 75% and 90% dependable year assessments, respectively, against the project's seasonal requirement of 8.755 MCM. Given these figures, the EAC emphasized that the long-term sustainability of the water source should be critically evaluated, and necessary conservation measures should be implemented to mitigate the risk of water scarcity affecting the project's viability and the surrounding ecological balance. The EAC raised concerns about water availability and its potential impact on the region’s ecosystem. To ensure sustainability, the EAC recommended conducting a comprehensive Water Utilization Mapping within a 10 km radius of the project site. This study should include:

- Assessment of all surface water sources (rivers, lakes, reservoirs, and canals)
- Evaluation of groundwater availability (aquifer condition, recharge potential, and extraction levels)
- Mapping of existing water users (agriculture, industries, and domestic consumption)
- Analysis of seasonal variations in water availability
- Assessment of potential risk for depletion of water availability due to project installation

Additionally, the Project Proponent has submitted a Memorandum of Understanding (MoU) dated 31.07.2024, signed between the Department of Water Resources, Government of Maharashtra and M/s Megha Engineering & infrastructures Limited, granting in-principle approval for the establishment of the Kamod Pumped Storage Project with a capacity of 2000 MW.

The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Close Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Kamod Close Loop Pumped Storage Hydro Electric Project (2000 MW) in an area of 395.23 Ha at Village Chaupale, Kamod, Lavhartodi, Kotkhamb and Nagziri, Sub District Sakri and Nawapur, District Dhule and Nandurbar, Maharashtra by M/s Megha Engineering & infrastructures Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

3.1.5. Recommendation of EAC

Recommended

3.1.6. Details of Terms of Reference

3.1.6.1. Specific

Miscellaneous	
1.	Both capital and recurring expenditure under EMP shall be submitted.
2.	Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
3.	The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.
4.	Drone video of project site shall be recorded and to be submitted.
5.	Undertaking need to be submitted on affidavit stating that no activities has been started on the project site.
6.	Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.

7.	Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.
8.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
Disaster Management	
1.	Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.
2.	The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.
Muck Management	
1.	Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.
2.	Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.
3.	Details of muck management such as dumping sites and its locations, transportation plan along with monitoring mechanism for muck transportation, detailing the road map of project construction site/ indicating the distances from HFL, river, project construction site along with types of road etc.
4.	Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the river during the high discharge/ flood or monsoon period. Prepare plan for stabilization of muck disposal sites using biological and engineering measures to ensure that muck does not roll down the slopes and shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area.
5.	Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.
Socio-economic Study	
1.	Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
2.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.
3.	PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.

4.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.
Environmental Management and Biodiversity Conservation:	
1.	PP shall submit the Water Utilization Mapping within a 10 km radius of the project for sustainability of ecosystem of the region.
2.	Detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department. The monitoring mechanism to ensure the survival of saplings shall be finalised in consultation with ICFRE.
3.	Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 302.29 Ha of forest land involved in the project shall be submitted within stipulated time.
4.	Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.
5.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.
6.	PP shall submit the detailed plan for filling the reservoir from the Rangawali dam along with necessary approval form water resource department.
7.	Transportation Plan for transporting construction materials shall be submitted.
8.	Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.
9.	In view of presence of Tribal population in the study area a detailed social impact assessment study shall be conducted in consultation with expert government organization/institute.
10.	The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.
11.	Calculation and values of GHGs (CO2, CH4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.
12.	The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report. Presence of any critical mineral zone in the proposed area be clarified from GSI.
13.	Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted.The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.
14.	Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.
1	Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish

5.	migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.
16.	Cumulative Impact of projects in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.
17.	Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.
18.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
19.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
20.	Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.
21.	Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

3.1.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Scope of EIA Study	
1.	The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analysed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.
Details of the Project and Site	
1.	General introduction about the proposed project.
2.	Details of Project and site giving L-Sections of all U/S and D/S Projects with all relevant maps and figures. Connect such information as to establish the total length of interference of Natural River and the committed unrestricted release from the site of Dam/Barrage into the main river.
3.	A map of boundary of the project site giving details of protected areas in the vicinity of 25 km of project location.
4.	Location details on a map of the project area with contours indicating main project features. The project layout shall be superimposed on a contour map of ground elevation showing main project features (viz. location of dam, Head works, main canal, branch canals, quarrying etc.) shall be depicted in a scaled map.

5.	Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least 1:50,000 scale and printed at least on A3 scale for clarity.
6.	Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
7.	Drainage pattern and map of the river catchment up to the proposed project site.
8.	Delineation of critically degraded areas in the directly draining catchment on the basis of Silt Yield Index as per the methodology of Soil and Land use Survey of India.
9.	Soil characteristics and map of the project area.
10.	Geological and Seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and canal sites.
11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.
12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14.	Different riverine habitats 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
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	

1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.
3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as follow s:	
1.	null
2.	null
3.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
4.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large

	dams.
5.	Landslide zone or area prone to landslide existing in the study area should be examined.
6.	Presence of important economic mineral deposit, if any.
7.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
8.	Impact of project on geological environment.
9.	null
10.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
11.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.
12.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
13.	null
14.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
15.	null
16.	(i) Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
17.	null
18.	History of the ground water table fluctuation in the study area.
19.	Water quality for both surface water and ground water for (i) Physical parameters (pH, temperature, electrical conductivity, TSS); (ii) Chemical parameters (Alkalinity, Hardness, BOD, COD, NO2, PO4, CI, SO4, Na, K, Ca, Mg, Silica, Oil & Grease, phenolic compounds, residual sodium carbonate); (iii) Bacteriological parameter (MPN, Total coliform) and (iv) Heavy Metals (Pb, As, Hg, Cd, Cr-6, total Cr, Cu, Zn, Fe) (6 locations).
20.	Delineation of sub and micro-watersheds, their locations and extent based on the All India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS
21.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
2	Run off, discharge, water availability for the project, sedimentation rate, etc.

2.	
23.	Basin characteristics
24.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
25.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
26.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
27.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
28.	Information on the 10-daily flow basis for the 90 per cent 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.
29.	The minimum environmental flow shall be 20% of the flow of four consecutive lean months of 90% dependable year, 30% of the average monsoon flow. The flow for remaining months shall be in between 20-30%, depending on the site specific requirements. A site specific study shall be carried out by an expert organization.
30.	Sedimentation data available with CWC may be used to find out the loss in storage over the years.
31.	Hydrological studies/data as approved by CWC shall be utilized in the preparation of EIA/EMP report. Actual hydrological annual yield may also be given in the report. Sedimentation data available with CWC may be used to find out the loss in storage over the years.
32.	A minimum of 1 km distance from the tip of the reservoir to the tail race tunnel should be maintained between upstream and downstream projects.
33.	Besides primary studies, review of secondary data/literature published for project area on flora & fauna including RET species shall be reported in EIA/EMP report.
34.	null
35.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
36.	Documentation of all plant species i.e. Angiosperm, Gymnosperm, Pteriodophytes, Bryophytes (all groups).
37.	General vegetation profile and floral diversity covering all groups of flora including lichens and orchids. A species wise list may be provided.
38.	Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index (IVI) , Shannon Weiner index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrates, size of quadrates etc. to be reported within the study area in different ecosystems.
39.	Existence of National park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.

40.	Economically important species like medicinal plants, timber, fuel wood etc.
41.	Details of endemic species found in the project area.
42.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along-with economic significance. Species diversity curve for RET species should be given.
43.	Cropping pattern and Horticultural Practices in the study area.
44.	null
45.	Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their present status alongwith Schedule of the species.
46.	Documentation of fauna plankton (phyto and zooplankton), periphyton, benthos and fish should be done and analysed.
47.	Information (authenticated) on Avi-fauna and wildlife in the study area.
48.	Status of avifauna their resident/ migratory/ passage migrants etc.
49.	Documentation of butterflies, if any, found in the area.
50.	Details of endemic species found in the project area.
51.	RET species-voucher specimens should be collected along-with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
52.	Existence of barriers and corridors, if any, for wild animals.
53.	Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
54.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities components.
55.	For categorization of sub-catchment into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catchment.
56.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplantktons, benthos etc.
57.	Fish and fisheries, their migration and breeding grounds.

58.	Fish diversity composition and maximum length & weight of the measured populations to be studies for estimation of environmental flow.
59.	Conservation status of aquatic fauna.
60.	Sampling for aquatic ecology and fisheries and fisheries must be conducted during three seasons Pre-monsoon (summer), monsoon and winter. Sizes (length & weight) of important fish species need to be collected and breeding and feeding grounds should also be identified along the project site or in vicinity.
61.	Collection of baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers and surroundings population.
62.	Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.
63.	Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
64.	The socio-economic survey/ profile within 10 km of the study area for demographic profile; Economic Structure; Developmental Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.
65.	Documentation of demographic, Ethnographic, Economic Structure and development profile of the area.
66.	Information on Agricultural Practices, Cultural and aesthetic sites, Infrastructure facilities etc.
67.	Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
68.	List of all the Project Affected Families with their name, age, educational qualification, family size, sex, religion, caste, sources of income, land & house holdings, other properties, occupation, source of income, house/land to be acquired for the project and house/land left with the family, any other property, possession of cattle, type of house etc.
69.	Special attention has to be given to vulnerable groups like women, aged persons etc. and to any ethnic/indigenous groups that are getting affected by the project.
Impact Prediction and Mitigation Measures	
1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources.
3.	Effect on soil, material, vegetation and human health.
4.	Impact of emissions from DG set used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustion in equipments and vehicles
6.	Fugitive emissions from various sources

7.	Changes in surface and ground water quality
8.	Steps to develop pisci-culture and recreational facilities
9.	Changes in hydraulic regime and downstream flow.
10.	Water pollution due to disposal of sewage
11.	Water pollution from labour colonies/ camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction / widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures.
13.	Changes in land use / land cover and drainage pattern
14.	Immigration of labour population
15.	Quarrying operation and muck disposal
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence.
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animals and fish.
25.	Impact on local community including demographic profile.
2	Impact on socio-economic status

6.	
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease
29.	Impact on increase traffic
30.	Impact on Holy Places and Tourism
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying up of natural springs and cause noise population will be studies. Proper record shall be maintained of the baseline information in the post project period.
32.	Positive and negative impacts likely to be accrued due to the project are listed.
Environmental Management Plan	
1.	null
2.	Biodiversity and Wildlife Conservation and Management Plan for the conservation and preservation of rare, endangered or endemic floral/faunal species or some National Park/Sanctuary/ Biosphere Reserve or other protected area is going to get affected directly or indirectly by construction of the project, then suitable conservation measures should be prepared in consultation with the State Forest Department and with the physical and financial details. Suitable conservation techniques (in-situ/ ex-situ) will be proposed under the plan and the areas where such conservation is proposed will be marked on a project layout map.
3.	Compensatory Afforestation shall be prepared by the State Forest Department in lieu of the forest land proposed to be diverted for construction of the project as per the Forest (Conservation) Act, 1980. Choice of plants for afforestation should include native and RET species, if any. This will be a part of the forest clearance proposal.
4.	Fisheries Conservation and Management Plan - a specific fisheries management measures should be prepared for river and reservoir. If the construction of fish ladder/ fish-way etc. is not feasible then measures for reservoir fisheries will be proposed. The plan will detail out the number of hatcheries, nurseries, rearing ponds etc. proposed under the plan with proper drawings. If any migratory fish species is getting affected then the migratory routes, time/season of upstream and downstream migration, spawning grounds etc will be discussed in details.
5.	Green Belt Development Plan along the periphery of the reservoir, approach roads around the colonies and other project components, local plant species must be suggested with physical and financial details. A layout map showing the proposed sites for developing the green belt should be prepared.
6.	Environmental Monitoring Programme to monitor the mitigatory measures implemented at the project site is required will be prepared. Provision for Environment Management Cell should be made. The plan will spell out the aspects required to be monitored, monitoring indicators/parameters with respect to each aspect and the agency responsible for the monitoring of that particular aspect throughout the project implementation.
7.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of free draining/ directly draining catchment based upon Remote Sensing and Geographical Information System (GIS) methodology and Sediment Yield Index (SYI) method of AISLUS, Deptt. of Agriculture, Govt. of India coupled with ground survey. Areas or watersheds falling under 'very severe' and 'severe' erosion categories should be provided and required to be treated. Both biological as well as engineering measures should be proposed in consultation with State Forest Department for areas requiring treatment. Year-wise schedule of work and monetary allocation should be provided. Mitigation measures to check shifting cultivation in the catchment area

	with provision for alternative and better agricultural practices should be included.
8.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. Results of the site specific earthquake design parameters should be approved by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
9.	Dam Break Analysis and Disaster Management Plan The outputs of dam break model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam Break scenario. To identify inundation areas, population and structures likely to be affected due to catastrophic floods in the event of dam failure. DMP will be prepared with the help of Dam Break Analysis. Maximum water level that would be attained at various points on the downstream in case of dam break will be marked on a detailed contour map of the downstream area, to show the extent of inundation. The action plan will include Emergency Action and Management plan including measures like preventive action notification, warning procedure and action plan for co-ordination with various authorities.
10.	Reservoir Rim Treatment Plan for stabilization of land slide / land slip zones, if any, around the reservoir periphery is to be prepared based on detailed survey of geology of the reservoir rim area. Suitable engineering and biological measures for treatment of identified slip zones to be suggested with physical and financial schedule. Layout map showing the landslide/landslip zones shall be prepared and appended in the chapter.
11.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.
12.	Restoration Plan for Quarry Sites and landscaping of colony areas, working areas, roads etc. Details of the coarse/fine aggregate/clay etc. required for construction of the project and the rock/clay quarries/river shoal sites identified for the project should be discussed along-with the Engineering and Biological measures proposed for their restoration with physical and financial details. Layout map showing quarry sites vis-à-vis other project components, should be prepared.
13.	Resettlement and Rehabilitation Plan needed to be prepared on the basis of findings of the socio- economic survey coupled with the outcome of public consultation held. The R&R package shall be prepared after consultation with the representatives of the project affected families and the State Government. Detailed budgetary estimates are to be provided. Resettlements site should be identified. The plan will also incorporate community development strategies.
14.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local populace.
15.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Pancahayats. Appropriate schemes shall be prepared under EMP for the Local Area Development Plan with sufficient financial provisions.
16.	Labour Management Plan for their Health and Safety.
17.	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.
18.	Energy Conservation Measures for the work force during construction with physical and financial details. Alternatives will be proposed for the labour force so that the exploitation of the natural resource (wood) for the domestic and commercial use is curbed.

19.	Environmental safeguards during construction activities including Road Construction.
20.	A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.
21.	Water, Air and Noise Management Plans to be implemented during construction and post-construction periods.

3.2. Agenda Item No 2:

3.2.1. Details of the proposal

Chakung Chu HEP by **KUNDAN HYDRO (GANGTOK) PRIVATE LIMITED** located at **NORTH DISTRICT,SIKKIM**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/SK/RIV/527111/2025	J-12011/10/2025-IA.I (R)	03/03/2025	River Valley/Irrigation projects (1(c))

3.2.2. Project Salient Features

26.2.1: The proposal is for grant of Terms of Reference (TOR) to the project for Chakung Chu Hydroelectric Project (82.5 MW) in an area of 42.24 Ha at Village Meyong, Naga-Namgor, Sentam and Singchit, Sub District Mangan District North District, Sikkim by M/s Kundan Hydro (Gangtok) Private Limited.

26.2.2 The Project Proponent and the accredited Consultant R. S. Envirolinks Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

i. Chakung Chu Hydroelectric Project is a medium scale hydroelectric project, being developed in Chakung Chu nallah and Ri Chu (New Meyong Chu) nallah in Mangan (North) district in Sikkim, some 2 Km upstream of its confluence with the Teesta River near Tung bridge.

ii. Geographically, the proposed project area is stretched between latitude 27˚ 31' 47.38"N to 27˚ 32' 59.32"N and longitude 88˚ 40' 33.68"E to 88˚ 39' 12.64"E. The stretch of Chakung Chu valley along the project area is generally V-shaped with a number of tributaries in dendritic pattern. The area is thinly populated at river terraces, the land use is mostly covered by thin forest, and some cultivated land.

iii. Ri Chu nallah (New Meyong Chu) discharge has been utilized to develop the Chakung Chu Hydro Power Project. The Ri Chu diversion site is near about 12 Km from Mangan and 5.0 km from Chakung Chu diversion site. The Diversion site lies between latitude 27° 40' 30'' N (at Weir) Longitude 88° 30' 00'' E. Reference of Toposheet No is OSM G45E10/11. This diversion Site is proposed on Ri Chu Nallah near New Meyong Chu village on Right bank of Ri Chu Nallah.

iv. **Catchment Area:** The catchment area of the proposed scheme of Chakung Chu nallah lies between longitude of 88° 40' E to 88° 48' E and latitude of 27° 31'N to 27° 35' N. Diversion site of Chakung Chu HEP is located at 27˚ 31' 47.38"N and 88˚ 40' 33.68"E. The catchment area of Chakung Chu nallah up to the project site is 96.91 sq. km. The length of Chakung Chu from origin to the proposed diversion site is about 19.42 km with average slope of 1 in 7.

v. **Land requirement:** The total land required for the construction of various project components of Chakung Chu HEP is estimated to be around 42.24 ha, out of which 26.11 ha is forest land and

16.13 ha is non-forest land.

vi. **Demographic details in 10 km radius of project area:**

vii. **Water Availability**: Average Discharge of Chakung chu nallah at 90%, 75% and 50 % dependable year is 5.75, 6.44 and 7.83 cumecs respectively. Average Discharge of Ri chu (New Meyong chu) nallah at 90%, 75% and 50 % dependable year is 1.56, 1.69 and 1.91 cumecs respectively. The design discharge is 14.83 cumecs.

viii. **Project Cost:** The estimated project cost is Rs 695.09 crore.

ix. **Environmental Sensitive area:** Khangchendzonga is the nearest protected area at a distance of 5.3 km from the project site. ESZ boundary notified vide MOEF&CC's notification no. S.O.2166(E) dated 27th August 2014. The Eco-sensitive Zone varies from 25 m to 200 m from the boundary of the sanctuary. All project components are outside the protected area as well as ESZ. The diversion sites of the project are at Chakung Chhu and Ri Chhu, tributaries of Teesta River.

x. MoU signed with State Government on 9th September 2024.

xi. Alternative Studies: 3 schemes were selected for the study.

	Favourable. Left bank is s uitable for the foundations of the barrage, abutment, c ollection pool, approach c onduit, desander chamber, and headrace pipe up to th e portal. Surface geological studies of exposed phyllite rock m ass also indicate favourabl e conditions, with major di scontinuity orientations al ong the HRT, surge shaft, and penstock areas extendi ng to the powerhouse.	Layout for Alternative I I is geologically similar to that of Layout Alternative I.	
	Minimum impact on flora and fauna of the area due t o small structure with smal l pondage. Submergence area (2.64ha) and length of Reservoir 340.0 m	Moderate impact on flor a and fauna due to high da, structure. Submergence area (3.82 ha) and maximum lengt h of Reservoir 374.0 m	
	Selected as Best Alternati ve	Considered but higher c ost & complexity due to unfavorable geological conditions, as well as th e higher cost and constr uction time associated w ith building a 55-meter-high dam, this alternativ e is deemed not feasible and is therefore not cons	

		idered.	

xii. **Status of Litigation Pending against the proposal:**

The Special Leave Petition (SLP) filed by M/s Amalgamated Transpower (India) Ltd. vide Diary No. 34140/2023 is pending consideration before the Supreme Court against Sikkim Power Development Corporation Ltd. regarding the cancellation of its contract for the development of hydroelectric projects.

xiii. The salient features of the project are as under:

Name of the Proposal	Chakung Chu Hydro Electric Project
Location (Including coordinates)	Diversion Site 1: 88˚ 40′ 33.68"E to 88˚ 39'12.64"E 27˚ 31' 47.38"N to 27˚ 32′59.32"N Diversion Site 2: 88˚ 35′ 00"E to 88˚ 39'00"E 27˚ 28' 00"N to 27˚ 33′00"N
Inter- state issue involved	No
Seismic zone	Zone-IV
Category of the project	A
Provisions	
Capacity / Cultural command area (CCA)	82.5 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil
Powerhouse Installed Capacity	82.5 MW
Generation of Electricity Annually	312.60 MU
No. of Units	3 nos. (2X33 MW+1X16.5 MW))
Additional information (if any)	Nil
Cost of project	695.09 Cr.
Total area of Project	42.24 ha
Height of Dam from River Bed (EL)	21.50 m
Length of Tunnel/Channel	2100 m (Diversion Site 1) 2700 m (Diversion Site 2)
Details of Submergence area	2.64 ha

Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	E-flow will be released as per applicable guidelines. A provision of 20% of the average of lean months' (Dec to March) flows has been kept.
Is Projects earlier studies in Cumulative I mpact assessment & Carrying Capacity stu dies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by b) EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sus taining river ecosystem.	No

No. of proposed disposal area/ (type of land- F orest/Pvt. land)	4.95 ha
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

Private Land	16.13 ha
Government land/Forest Land	26.11 ha
Submergence area/Reservoir area	2.64 ha
Land required for project components	39.60 ha
Additional information (if any)	Nil

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate / letter/ Rem arks**
Reserve Forest/Protected Forest Land	---	Distance from nearest protected ar ea (Khangchendzonga NP) is 5.30 Km, however, proposed project is outside the notified ESZ boundary of the sanctuary.
National Park	---	
Wildlife Sanctuary	---	

Court Case	The Special Leave Petition (SLP) filed by M/s Amalga mated Transpower (India) Ltd. vide Diary No. 34140/2 023 is pending consideration before the Supreme Court against Sikkim Power Development Corporation Ltd. r egarding the cancellation of its contract for the develop ment of hydroelectric projects.

Additional information (if any)	Nil

Particulars	Details
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSE T) (NABET Accredited Consultant Organization) Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : I(C) Address : 403, Bestech Chambers, Block-B, Susha nt Lok Phase I, Sector 43, Gurugram, Haryana - 1 22009 E-mail : ravi@rstechnologies.co.in Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	• Project will generate 312.60 MU annually in a 9 0% dependable year. • A number of marginal activities and jobs will be available to the locals during the construction p hase. • Local Area Development, facilities in Education, medical, transportation, road network and other infrastructure. • An opportunity for small-scale and cottage indust ries to develop in the area
Status of other statutory clearances	Forest Clearance - Online application seeking f orest diversion for around 26.11 Ha after receip t of ToR Approval. Alongside, other statutory c learances (as applicable) from State as well as Central government will be obtained post comp letion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studi es
Additional detail (If any)	Nil

3.2.3. Deliberations by the committee in previous meetings

N/A

3.2.4. Deliberations by the EAC in current meetings

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Chakung Chu Hydroelectric Project (82.5 MW) in an area of 42.24 Ha at Village Meyong, Naga-Namgor, Sentam and Singchit, Sub District Mangan District North District, Sikkim by M/s Kundan Hydro (Gangtok) Private Limited.

The project/activity falls under Category B of item 1(c), 'River Valley Projects,' as per the Schedule of the Environmental Impact Assessment Notification, 2006, as Khangchendzonga is the nearest protected area at a distance of 5.3 km from the project site and attracts general condition of the said Notification, therefore, requires appraisal at the central level by the sectoral EAC in the Ministry.

The EAC noted that Chakung Chu Hydropower Project is a run-of-the-river (RoR) project. The head works site of the project is located downstream of the confluence of Chakung Chu with Glong Chu, whereas the powerhouse site of the project is located near Tung bridge just downstream confluence of Chakung Chu with Teesta River. The design discharge is 14.83 cumecs.

The EAC observed that the total land required for the construction of various project components of Chakung Chu HEP is estimated to be around 42.24 ha, out of which 26.11 ha is forest land and 16.13 ha is non-forest land, However, the application for Stage-I Forest Clearance (FC) has not yet been submitted, necessitating further action from the Project Proponent.

The EAC also noted that Khangchendzonga is the nearest protected area, located 5.3 km from the project site. The Eco-Sensitive Zone (ESZ) boundary was notified through MOEF&CC's notification no. S.O. 2166(E) dated 27th August 2014, with the ESZ ranging from 25 meters to 200 meters from the sanctuary boundary. While the EAC acknowledged that all project components lie outside both the protected area and the ESZ, it recommended a detailed biodiversity impact assessment to local flora, fauna, and migratory species.

The EAC, through analysis of .kml files and videography presented by the PP the EAC suggested to conduct comprehensive risk analysis on potential disasters such as GLOFs and landslides in the region. Special protective measures must be incorporated into Environmental Management Plan (EMP) to mitigate these risks effectively.

The EAC observed that the Special Leave Petition (SLP) filed by M/s Amalgamated Transpower (India) Ltd. vide Diary No. 34140/2023 is pending consideration before the Supreme Court against Sikkim Power Development Corporation Ltd. regarding the cancellation of its contract for the development of hydroelectric projects.

26.2.4 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Standard ToR issued by the Ministry for conducting EIA study to the project for Chakung Chu Hydroelectric Project (82.5 MW) in an area of 42.24 Ha at Village Meyong, Naga-Namgor, Sentam and Singchit, Sub District Mangan District North District, Sikkim by M/s Kundan Hydro (Gangtok) Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

3.2.5. Recommendation of EAC

Recommended

3.2.6. Details of Terms of Reference

3.2.6.1. Specific

Miscellaneous	
1.	Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly approvedby CWC /CEA shall be submitted.
2.	Undertaking need to submitted on affidavit that regarding no activities has been yet started on the

	project site and water allocated to this scheme shall not be diverted to other purpose.
3.	Both capital and recurring expenditure under EMP shall be submitted.
4.	The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
5.	Aerial view video of project site shall be recorded and to be submitted.
6.	Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project shall be submitted.
7.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
Disaster Management	
1.	PP shall conduct comprehensive studies on potential disasters such as GLOFs and landslides in consultation with reputed government institutions. Additionally, special protective measures must be incorporated into the EIA/EMP report.
2.	CAT plan, Dam break analysis, Disaster Management Plan and Fisheries Management Plan be prepared along with other EMPs and incorporated in the EIA/EMP report.
3.	Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.
Muck Management	
1.	Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.
2.	Details of muck management such as dumping sites and its locations, transportation plan along with monitoring mechanism for muck transportation, detailing the road map of project construction site/ indicating the distances from HFL, river, project construction sitealong with types of road etc.
3.	Details of water sprinkling arrangements for arresting the fugitive / dust, emission from transportation and other project activities in project construction area.
4.	Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the river during the high discharge/ flood or monsoon period. Prepare plan for stabilization of muck disposal sites using biological and engineering measures to ensure that muck does not roll down the slopes and shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area.
5.	Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.
Socio-economic Study	

1.	Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
2.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
3.	Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
4.	Social impact assessment for the tribal population and others be conducted.
5.	Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared. Details of settlement in 10 km area shall be submitted.
6.	Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.
Environmental Management and Biodiversity Conservation:	
1.	Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power.
2.	The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report.
3.	Environmental matrix during construction and operational phase needs to be submitted. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
4.	Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature required to be cut for barrage creation and other project component.
5.	Three season (Pre-monsoon, Monsoon and winter season) baseline data of all the environmental attributes including biological environment as mentioned in the Standard ToR shall be collected for preparation of EIA/EMP report.
6.	Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
7.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
8.	A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.
9.	Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ) and Wildlife Sanctuary.

10.	In case any Wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
11.	Explore the possibilities to reduce forest area for the construction of proposed project.
12.	Conduct geological survey and find out availability of mineral in study area. Take Geological opinion from GSI regarding mineral zone in the project study area.
13.	Density of forest and its types including tentative nos of tree felled during construction of the project and details of plants species to be planted under compensatory plantation be mentioned in Compensatory Afforestation Plan under EIA/EMP.
14.	Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
15.	A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
16.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.
17.	Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
18.	Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.
19.	Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.
20.	The project proponent must also include information if any, on the critical mineral zone mining or potential in the projected area from Geological Survey of India /Mineral Exploration Corporation Ltd or similar such Government organizations.

3.2.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Scope of EIA Study	
1.	The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analysed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.
Details of the Project and Site	
1.	General introduction about the proposed project.
2.	Details of Project and site giving L-Sections of all U/S and D/S Projects with all relevant maps and figures.

	Connect such information as to establish the total length of interference of Natural River and the committed unrestricted release from the site of Dam/Barrage into the main river.
3.	A map of boundary of the project site giving details of protected areas in the vicinity of 25 km of project location.
4.	Location details on a map of the project area with contours indicating main project features. The project layout shall be superimposed on a contour map of ground elevation showing main project features (viz. location of dam, Head works, main canal, branch canals, quarrying etc.) shall be depicted in a scaled map.
5.	Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least 1:50,000 scale and printed at least on A3 scale for clarity.
6.	Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
7.	Drainage pattern and map of the river catchment up to the proposed project site.
8.	Delineation of critically degraded areas in the directly draining catchment on the basis of Silt Yield Index as per the methodology of Soil and Land use Survey of India.
9.	Soil characteristics and map of the project area.
10.	Geological and Seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and canal sites.
11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.
12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14.	Different riverine habitats 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
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.

Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	
1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.
3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as follow s:	

1.	null
2.	null
3.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
4.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
5.	Landslide zone or area prone to landslide existing in the study area should be examined.
6.	Presence of important economic mineral deposit, if any.
7.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
8.	Impact of project on geological environment.
9.	null
10.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
11.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.
12.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
13.	null
14.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
15.	null
16.	(i) Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
17.	null
18.	History of the ground water table fluctuation in the study area.
19.	Water quality for both surface water and ground water for (i) Physical parameters (pH, temperature, electrical conductivity, TSS); (ii) Chemical parameters (Alkalinity, Hardness, BOD, COD, NO2, PO4, CI, SO4, Na, K, Ca, Mg, Silica, Oil & Grease, phenolic compounds, residual sodium carbonate); (iii) Bacteriological parameter (MPN, Total coliform) and (iv) Heavy Metals (Pb, As, Hg, Cd, Cr-6, total Cr, Cu, Zn, Fe) (6 locations).

20.	Delineation of sub and micro-watersheds, their locations and extent based on the All India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS
21.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
22.	Run off, discharge, water availability for the project, sedimentation rate, etc.
23.	Basin characteristics
24.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
25.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
26.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
27.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
28.	Information on the 10-daily flow basis for the 90 per cent 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.
29.	The minimum environmental flow shall be 20% of the flow of four consecutive lean months of 90% dependable year, 30% of the average monsoon flow. The flow for remaining months shall be in between 20-30%, depending on the site specific requirements. A site specific study shall be carried out by an expert organization.
30.	Sedimentation data available with CWC may be used to find out the loss in storage over the years.
31.	Hydrological studies/data as approved by CWC shall be utilized in the preparation of EIA/EMP report. Actual hydrological annual yield may also be given in the report. Sedimentation data available with CWC may be used to find out the loss in storage over the years.
32.	A minimum of 1 km distance from the tip of the reservoir to the tail race tunnel should be maintained between upstream and downstream projects.
33.	Besides primary studies, review of secondary data/literature published for project area on flora & fauna including RET species shall be reported in EIA/EMP report.
34.	null
35.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
36.	Documentation of all plant species i.e. Angiosperm, Gymnosperm, Pteriodophytes, Bryophytes (all groups).
3	General vegetation profile and floral diversity covering all groups of flora including lichens and orchids. A

7.	species wise list may be provided.
38.	Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index (IVI) , Shannon Weiner index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrates, size of quadrates etc. to be reported within the study area in different ecosystems.
39.	Existence of National park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
40.	Economically important species like medicinal plants, timber, fuel wood etc.
41.	Details of endemic species found in the project area.
42.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along-with economic significance. Species diversity curve for RET species should be given.
43.	Cropping pattern and Horticultural Practices in the study area.
44.	null
45.	Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their present status alongwith Schedule of the species.
46.	Documentation of fauna plankton (phyto and zooplankton), periphyton, benthos and fish should be done and analysed.
47.	Information (authenticated) on Avi-fauna and wildlife in the study area.
48.	Status of avifauna their resident/ migratory/ passage migrants etc.
49.	Documentation of butterflies, if any, found in the area.
50.	Details of endemic species found in the project area.
51.	RET species-voucher specimens should be collected along-with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
52.	Existence of barriers and corridors, if any, for wild animals.
53.	Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
54.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities components.

55.	For categorization of sub-catchment into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catchment.
56.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplantktons, benthos etc.
57.	Fish and fisheries, their migration and breeding grounds.
58.	Fish diversity composition and maximum length & weight of the measured populations to be studies for estimation of environmental flow.
59.	Conservation status of aquatic fauna.
60.	Sampling for aquatic ecology and fisheries and fisheries must be conducted during three seasons Pre-monsoon (summer), monsoon and winter. Sizes (length & weight) of important fish species need to be collected and breeding and feeding grounds should also be identified along the project site or in vicinity.
61.	Collection of baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers and surroundings population.
62.	Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.
63.	Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
64.	The socio-economic survey/ profile within 10 km of the study area for demographic profile; Economic Structure; Developmental Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.
65.	Documentation of demographic, Ethnographic, Economic Structure and development profile of the area.
66.	Information on Agricultural Practices, Cultural and aesthetic sites, Infrastructure facilities etc.
67.	Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
68.	List of all the Project Affected Families with their name, age, educational qualification, family size, sex, religion, caste, sources of income, land & house holdings, other properties, occupation, source of income, house/land to be acquired for the project and house/land left with the family, any other property, possession of cattle, type of house etc.
69.	Special attention has to be given to vulnerable groups like women, aged persons etc. and to any ethnic/indigenous groups that are getting affected by the project.
Impact Prediction and Mitigation Measures	
1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources.

3.	Effect on soil, material, vegetation and human health.
4.	Impact of emissions from DG set used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustion in equipments and vehicles
6.	Fugitive emissions from various sources
7.	Changes in surface and ground water quality
8.	Steps to develop pisci-culture and recreational facilities
9.	Changes in hydraulic regime and downstream flow.
10.	Water pollution due to disposal of sewage
11.	Water pollution from labour colonies/ camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction / widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures.
13.	Changes in land use / land cover and drainage pattern
14.	Immigration of labour population
15.	Quarrying operation and muck disposal
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence.
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-identification of suitable native tree species for compensatory afforestation and green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water

24.	Impact on breeding and nesting grounds of animals and fish.
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease
29.	Impact on increase traffic
30.	Impact on Holy Places and Tourism
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying up of natural springs and cause noise population will be studies. Proper record shall be maintained of the baseline information in the post project period.
32.	Positive and negative impacts likely to be accrued due to the project are listed.
Environmental Management Plan	
1.	null
2.	Biodiversity and Wildlife Conservation and Management Plan for the conservation and preservation of rare, endangered or endemic floral/faunal species or some National Park/Sanctuary/ Biosphere Reserve or other protected area is going to get affected directly or indirectly by construction of the project, then suitable conservation measures should be prepared in consultation with the State Forest Department and with the physical and financial details. Suitable conservation techniques (in-situ/ ex-situ) will be proposed under the plan and the areas where such conservation is proposed will be marked on a project layout map.
3.	Compensatory Afforestation shall be prepared by the State Forest Department in lieu of the forest land proposed to be diverted for construction of the project as per the Forest (Conservation) Act, 1980. Choice of plants for afforestation should include native and RET species, if any. This will be a part of the forest clearance proposal.
4.	Fisheries Conservation and Management Plan - a specific fisheries management measures should be prepared for river and reservoir. If the construction of fish ladder/ fish-way etc. is not feasible then measures for reservoir fisheries will be proposed. The plan will detail out the number of hatcheries, nurseries, rearing ponds etc. proposed under the plan with proper drawings. If any migratory fish species is getting affected then the migratory routes, time/season of upstream and downstream migration, spawning grounds etc will be discussed in details.
5.	Green Belt Development Plan along the periphery of the reservoir, approach roads around the colonies and other project components, local plant species must be suggested with physical and financial details. A layout map showing the proposed sites for developing the green belt should be prepared.
6.	Environmental Monitoring Programme to monitor the mitigatory measures implemented at the project site is required will be prepared. Provision for Environment Management Cell should be made. The plan will spell out the aspects required to be monitored, monitoring indicators/parameters with respect to each aspect and the agency responsible for the monitoring of that particular aspect throughout the project implementation.

7.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of free draining/ directly draining catchment based upon Remote Sensing and Geographical Information System (GIS) methodology and Sediment Yield Index (SYI) method of AISLUS, Deptt. of Agriculture, Govt. of India coupled with ground survey. Areas or watersheds falling under 'very severe' and 'severe' erosion categories should be provided and required to be treated. Both biological as well as engineering measures should be proposed in consultation with State Forest Department for areas requiring treatment. Year-wise schedule of work and monetary allocation should be provided. Mitigation measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be included.
8.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. Results of the site specific earthquake design parameters should be approved by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
9.	Dam Break Analysis and Disaster Management Plan The outputs of dam break model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam Break scenario. To identify inundation areas, population and structures likely to be affected due to catastrophic floods in the event of dam failure. DMP will be prepared with the help of Dam Break Analysis. Maximum water level that would be attained at various points on the downstream in case of dam break will be marked on a detailed contour map of the downstream area, to show the extent of inundation. The action plan will include Emergency Action and Management plan including measures like preventive action notification, warning procedure and action plan for co-ordination with various authorities.
10.	Reservoir Rim Treatment Plan for stabilization of land slide / land slip zones, if any, around the reservoir periphery is to be prepared based on detailed survey of geology of the reservoir rim area. Suitable engineering and biological measures for treatment of identified slip zones to be suggested with physical and financial schedule. Layout map showing the landslide/landslip zones shall be prepared and appended in the chapter.
11.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.
12.	Restoration Plan for Quarry Sites and landscaping of colony areas, working areas, roads etc. Details of the coarse/fine aggregate/clay etc. required for construction of the project and the rock/clay quarries/river shoal sites identified for the project should be discussed along-with the Engineering and Biological measures proposed for their restoration with physical and financial details. Layout map showing quarry sites vis-à-vis other project components, should be prepared.
13.	Resettlement and Rehabilitation Plan needed to be prepared on the basis of findings of the socio- economic survey coupled with the outcome of public consultation held. The R&R package shall be prepared after consultation with the representatives of the project affected families and the State Government. Detailed budgetary estimates are to be provided. Resettlements site should be identified. The plan will also incorporate community development strategies.
14.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local populace.
15.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Pancahayats. Appropriate schemes shall be prepared under EMP for the Local Area Development Plan with sufficient financial provisions.
16.	Labour Management Plan for their Health and Safety.
1	Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.

7.	
18.	Energy Conservation Measures for the work force during construction with physical and financial details. Alternatives will be proposed for the labour force so that the exploitation of the natural resource (wood) for the domestic and commercial use is curbed.
19.	Environmental safeguards during construction activities including Road Construction.
20.	A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.
21.	Water, Air and Noise Management Plans to be implemented during construction and post-construction periods.

3.3. Agenda Item No 3:

3.3.1. Details of the proposal

Kopra Medium project by **WATER RESOURCES DIVISION NO ONE SAGAR** located at **SAGAR,MADHYA PRADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/MP/RIV/524621/2025	J-12011/11/2022- IA.I (R)	19/02/2025	River Valley/Irrigation projects (1(c))

3.3.2. Project Salient Features

26.3.1: The proposal is for grant of Terms of Reference (TOR) to the project for Kopra Medium Irrigation Project (CCA: 9990 Ha) in an area of 1044.52 Ha at village Bamarakunj, Berkheri Kalan, Devpura, Kanmar, etc, Sub District Rehli, Garhakota, District Sagar, Madhya Pradesh by M/s Water Resources Division No One Sagar.

26.3.2: The Project Proponent and the accredited Consultant M/s Enviro Infra Solutions Pvt Ltd, made a detailed presentation on the salient features of the project and informed that:

i. Madhya Pradesh Water Resource Department, Tulsi Nagar, Bhopal, Madhya Pradesh is the inherent project proponent. The Madhya Pradesh Water Resources Department (MPWRD). River Kopra is a tributary of river Sonar ultimate part of KEN Sub Basin. The river Kopra originates near village Gopalpura of Tehsil Deori, District Sagar.

ii. **Project Location**: The Proposed dam site is located across river Kopra near village-Bagaspura, Tehsil-Rehli, District-Sagar of Madhya Pradesh, at Latitude: 23°36'22" N, Longitude: 79° 10'13" E and at a distance of 60 Km from Sagar on Sagar-Rehii-Jabalpur road up to Chhirari then 4 Km up to Bagaspura on Chhirari Baleh road. Topo Sheet No. of the proposed site is 55 M/2.

iii. **Project Background**

Since, there is no major project is being constructed on Sonar River or its tributaries until date. The construction of this project would help in maximum utilization of water in concerned areas facing a high scarcity of water for irrigation, resulting to the development of the area. This project will also provide water for drinking purpose to the rural area situated in nearby area and would promote the development of more industries in the nearby area.

iv. The project lies on the western periphery of Nauradehi Sanctuary Muhli range. So its importance for Nauradehi Sanctuary is rather more than the irrigation benefits of the project. The long spreaded

Nauradehi Sanctuary area is facing severe scarcity of water for its wildlife especially during summer. The construction of this project will provide assured water availability to Nauradehi wild life and a water wall between Sanctuary and peripheral civil habitation. The Ken basin specially known suitability for crocodiles, the Kopra reservoir may be used as a good breeding center and crocodile Sanctuary along with all other aquatic life.

v. Further, the command area identified under Kopra Medium Project lies in the deep black cotton soils and is water scarce region of Ken Sub basin. This project will definitely bring economic prosperity to this area due to increased agricultural activities by fulfilling the demand of irrigation water required by farmers.

vi. Though not planned, many other incidental benefits like recharge of ground water in command area, development of agro based industries/food processing units, employment generation in construction phase and afterwards, development of tourist spots, etc. will be benefitted from the project. This will result in upliftment of socio - economic condition of people living in water scarce areas of Rehli Tehsil of Sagar district of Madhya Pradesh State. This will provide annual irrigation to about 9990 Ha.

vii. The Kopra Medium Project envisages construction of an earthen dam with Side Spill Way, pump house on Submergence with rising main. Dam is constructed 1620.00 M long Dam with a maximum height of 23.81 M. The 82.50 M long Side Spillway & 30 m NOF including key wall (on both side) with 6 Nos radial gates (including 1 standby) of size 11.00 M x 6.00 M with a maximum discharging capacity of 1597.69 Cumecs.

viii. **Land requirement:** Submergence Area-1044.52 ha. Area for dam and canal system is 1037.39 Ha. Detail of Submergence Area:

Private land 712.62 Ha.
Government land 59.90 Ha.
Forest land 272.00 Ha.
Total 1044.52 Ha.

Further Land needed for Unit II canal is 1.15 ha Forest land and Temporary land acquisition 10 ha.

ix. **Demographic details in 10 km radius of project area:** The human population in Sagar district of Madhya Pradesh will be benefited due to the assured irrigation supply. The total population as per 2011 census in Sagar district is 15.5 lakhs with male and female population as 8.00 and 7.5 lakh resp. Most of this population is dependent entirely on Agriculture which is mainly rain fed at present. Due to the construction of this Dam this sizeable population depending on agriculture in the command areas will be benefitted due to increased agricultural activities.

x. **Water requirement:**

The quantity of water required during construction is estimated as 70 KLD which shall be drawn from the Kopar river water can be pumped and stored in a tank at higher elevation. The domestic requirement shall be 40 KLD which shall be met from the ground water resource. Post construction the domestic requirement shall be 5 KLD only.

xi. **Project Cost:** The estimated project cost is Rs 292.37 Cr.

xii. **Project Benefit:** Total Employment will be 100 persons as direct & 10 persons during operation stage. The project authority proposes to allocate Rs. 4.38 Cr. @ of 1.5% towards CER (as per Ministry's OM dated 1st May 2018).

xiii. **Environmental Sensitive area**: The project submergence area falls in Nauradehi Wildlife Sanctuary and its Eco Sensitive Zone (268.39 ha)

xiv. **Scheduled -I species:** Crocodile and Indian Peafowl. Further investigation will be done during EIA study.

xv. **Alternative Studies:** Three alternative sites were studied and Option No. I is considered best out of three alignments. Option No. 1 for planning is the best option as per the feasibility study. Other options do not seem to be suitable from the technical, economic, social and environmental point of view in view of displacement, submergence of forest and agricultural land.

Sl. N	Detai	Capacit	Sub	Affe

o.	ls of Alternative	y of reservoir (MCM)	merge in Ha	cted Forest land in ha.
1.	Alignment 1	48.43	1044.52	272
2.	Alignment 2	48.43	1083.47	293.92
3.	Alignment 3	48.93	1195.57	402.04

The above three options were discussed by Chief Engineer Dhasan Ken Kachhar Water Resources Department and Superintending Engineer Water Resources Division Sagar and they came to the conclusion that the proposal of Option No. 1 is best option**.**

xvi. **Details of Solid waste/ Hazardous waste generation/ Muck and its management:**

- Solid waste - During construction phase, labour colonies are proposed to be located at various locations, close to major construction sites. About 100 laborers and 10 technical staff are likely to congregate in the area during construction phase. The average per capita solid waste generated is of the order of 210 gm/day/person.

- Spoil, overburden or mine wastes - In this project, it is proposed to collect the construction waste from various construction sites, and disposed at sites identified in consultation with the district administration. Various construction sites would be properly leveled. The leveling or reclamation of various construction sites shall be made mandatory for the contractor, involved in the construction work. The details of the same shall be covered as a part of EMP to be presented as a part of the EIA report.

- Hazardous wastes & Other industrial process wastes - NA

- Construction or demolition wastes - Construction waste from various construction sites will be disposed at sites identified in consultation with the district administration.

- Agricultural wastes - The proposed project envisages enhancement of irrigation intensity in the CCA of 9990 ha in Sagar district, Madhya Pradesh, which will increase agriculture-production, there by increasing agricultural waste. Appropriate measures for the reuse and recycling of agricultural waste will be suggested as a part of the EMP study.

xix. The salient features of the project are as under:-

1. Project Details

Name of the Proposal	Kopra Medium Irrigation Project Proposal No :IA/MP/RIV/524621/2025 File No :J-12011/11/2022- IA.I (R)
Location (Including Coordinates)	Near Village Badarchua, Tehsil Rehli, District Sagar, M.P. Coordinates of Dam Site 23° 36'22"N,79°10'13"E
Inter- state issue involved	Not Applicable
Seismic zone	Zone II

2. Category Details:

Category of the project	Category 'A'
Provisions	New Irrigation Project
Capacity / Cultural command area (CCA)	CCA = 9990 ha
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Submergence area of the project lies in Nauradehi Wildlife Sanctuary and its Eco sensitive zone (Forest area in NWS: 268.39 ha).

3. Electricity Generation Capacity: Nil

4. ToR/ EC Details:

Cost of project	Rs. 292.37 Crore
Total area of Project	Submergence Area = 1044.52 ha

	Culturable Command Area = 9990 ha
Height of Dam from River Bed (EL)	23.81m
Length of Tunnel/Channel	NA
Details of submergence area	The submergence area at FRL is 1044.52 ha. The non-forest area under submergence area is 772.52 ha and forest land 272 ha
Types of Waste and quantity of generation during construction / Operation	• Solid waste - During construction phase, labour colonies are proposed to be located at various locations, close to major construction sites. About 100 laborers and 10 technical staff are likely to congregate in the area during construction phase. The average per capita solid waste generated is of the order of 210 gm/day/person. • Spoil, overburden or mine wastes - In this project, it is proposed to collect the construction waste from various construction sites, and disposed at sites identified in consultation with the district administration. Various construction sites would be properly leveled. The leveling or reclamation of various construction sites shall be made mandatory for the contractor, involved in the construction work. The details of the same shall be covered as a part of EMP to be presented as a part of the EIA report. • Hazardous wastes & Other industrial process wastes - NA • Construction or demolition wastes - Construction waste from various construction sites will be disposed at sites identified in consultation with the district administration. • Agricultural wastes - The proposed project envisages enhancement of irrigation intensity in the CCA of 9990 ha in Sagar district, Madhya Pradesh, which will increase agriculture-production, there by ncreasing agricultural waste. Appropriate measures for the reuse and recycling of agricultural waste will be suggested as a part of the EMP study.
E-Flows for the Project	• Catchment area at dam site is 231.80sq km and average rainfall in upstream is 1100 mm. • Total 75% dependable virgin yield is computed as 52.00 MCM using R-R Relationship. • Upstream utilization has been estimated as 9.011 MCM; making net yield at dam site as 42.989 MCM. 99% of the yield is contributed by monsoon flow and only about 1% yield will

	be come from non-monsoon period. • Therefore, to mitigate the impact of reduced flo w or drying up of the river downstream of th e dam; the project is designed with live storage / pro posed utilization of 41.24 MCM, and remaini ng water from monsoon contribution will be continuously discharged for downstream user s. • The quantum works out to be 1.749 MCM water available in pre-project conditions. • Therefore, no additional environment flow is req uired to be released during monsoon period. • To ensure that downstream conditions do not ch ange during non-monsoon period, entire discharge of non-monsoon period i.e.1.749M CM is recommended to be released as enviro nmental flow.
Is Projects earlier studied in Cumulative Impact assessment & Carrying Capacity studies(CIA&CC) for River in which project located. If yes then E-flow with TOR / R ecommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain crite ria for sustaining river ecosystem.	No (Explained above)

5. Muck Management Details

No. of proposed disposal area / (type of land- Fo rest / Pvt land)	Nil • Muck generated from dam's foundation shall be utilized for earthen dam, producing coarse an d fine aggregate for concrete production and i n fillings for developing areas for constructio n facilities. • Muck generated from laying pipe line network w ill be utilized for refilling of the trenches and the approach road proposed to be constructed along the canal. Also, the surplus soil requirin g disposal will be spread on low lying farmer s field with their consent, spread along the ro ute in the low lying areas, laid in the commun ity undulating area of the connected villages with the consent of concerning Gram-pancha yat or Janpad Panchayat. • The muck may also be used by nearby Gram Pan chayats for construction of village roads etc.
Muck management plan	• Muck generated from dam's foundation after ass

	uming swell factor of 25% has been estimated as 35,84,075.00 cum which shall be utilized for eart hen dam, producing coarse and fine aggregate for concrete production and in fillings for developing areas for construction facilities. •Muck requiring disposal from pipeline has been estimated as 2,18,750.00cum. •The total muck so generated will be utilized for r efilling of the trenches and construction of other s tructures.
Monitoring mechanism for Muck Disposal Tran sportation	Contractor and WRD

6. Land Area Breakup:

Total Private land	712.62 ha
Total Government Land / Forest Land	59.90 ha (Government Revenue Land), 272 ha Forest Land
Submergence area / Reservoir area	1044.52 ha (Out of which 712.62 ha Private Land, 59.90 ha Government Land and 272 ha Forest Land)
Land required for project Components (Part of Submergence ar ea)	3.5 ha
Total Land Requirement	1044.52 ha

7. Presence of Environmentally Sensitive Areas in the Study Area:

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/ letter/ Remarks**
Reserve Forest / Protected Forest Land	Yes	3.61 ha under DFO South Sagar (MP)
National Park	No	
Wildlife Sanctuary	Yes	268.39 Ha under DFO Nauradehi Letter No./2021/3721 dated 24/11/2021

8. Court Cases Details: Nil

Particulars	**Letter No. and Date**
Certified EC compliance report (if	NA

applicable)	
Status of Stage- I FC	Stage I proposal submitted vide Proposal No. FP/MP/IRRIG/143864/2021
Additional detail (If any)	Application for Wildlife clearance is under Process with application number WL/MP/IRRIG/509017/20124
Is FRA (2006) done for FC-I	Yes

10. Miscellaneous :

Particulars	**Details**
Details of consultant	Enviro Infra Solutions Pvt. Ltd., Ghaziabad QCIQCI No. 68 as per March, 2025, NABET/EIA/2225/RA 0300 Valid: November 27 2025
Project benefit	• Annual Rabi irrigation of 9990 ha • Development of fisheries in the reservoir • Employment to around 80 local labour during construction period. 5 MCM Drinking water to Rehli Blocks and 7.19 MCM for survival of wildlife of Naurade hi wildlife sanctuary
Status of other statutory clearance	Forest and Wildlife Clearances are under process
R&R details	• There are 180 families to be displaced and rehabited hence R&R plan will be prepared as per Rehabiliatation and resettlement act 2013. Land of 13 villages is coming under submergence. Private and Govt. Land near to the project site is proposed to be identified and acquired. • The Rehabilitation and Resettlement Plan has been prepared to comprehensively address the issues arising out of land acquisition, assessment of land/house/asset coming under acquisition, estimation of extent of loss and compensation to be offered in line with The Right to Fair Compensation and Transparency in Land Acquisition, Reh

	abilitation and Resettlement Act, 2013 (RFCT_LA RR). `Total budget allocated for LA, R&R is Rs. 14 2.36 Crore.

3.3.3. Deliberations by the committee in previous meetings

N/A

3.3.4. Deliberations by the EAC in current meetings

26.3.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA study for Kopra Medium Irrigation Project (CCA: 9990 Ha) in an area of 1044.52 Ha at village Bamarakunj, Berkheri Kalan, Devpura, Kanmar, etc, Sub District Rehli, Garhakota, District Sagar, Madhya Pradesh by M/s Water Resources Division No One Sagar.

The EAC noted that the present project proposal comes under "B2" category; as CCA is 9990 HA which is less than 10,000 Ha, hence, only EMP is required as per the provisions of the EIA Notification, 2006, as amended. However, due to project submergence area falls in Nauradehi Wildlife Sanctuary and its Eco Sensitive Zone, the project will be appraised at central level as Category 'A' project.

The total land requirement for the project is 1044.52 Ha, out of which 272.00 Ha is forest land, 712.62 Ha is private land and 59.90 Ha is a government land. It was noted that the application for Stage-I Forest Clearance for the diversion of 272 ha Forest land was submitted to MoE&FCC vide letter No. FP/MP/lRRIG/143864/2021, Date 29/06/2021.

The proposed Kopra Medium Project is proposed on River Kopra near Badarchuwan village of Rehli Tehsil,district Sagar. The project is envisaged to have a live storage capacity of 41.24 MCM. PP submitted that the Catchment area of the river at dam site is 231.80 Km², 75% dependable yield is worked out 52.00 MCM , Designed flood is worked out to be 1597.69 Cumec and Sagar district is in Earthquake Zone-II.

The EAC observed that the PP has informed that Submergence area of the project lies in Nauradehi Wildlife Sanctuary and its Eco sensitive zone, declared through Notification S.O. 3133(E) dated 26.09.2017 (Forest area: 268.39 ha) under DFO Nauradehi Letter No./2021/3721 dated 24/11/2021. Nauradehi Wildlife Sanctuary has been experiencing severe water scarcity, particularly during the summer months, posing a significant challenge to the sustenance of its wildlife. The proposed project is expected to play a crucial role in ensuring a consistent water supply to the sanctuary. The EAC underscored the need for stringent environmental safeguards to minimize potential ecological disruptions.

Additionally, the EAC took note that the application for wildlife clearance (Application No. WL/MP/IRRIG/509017/20124) is currently under process, having been submitted on 20.12.2024. The project proponent informed that a Wildlife Management Plan has been prepared by the State Forest Research Institute (SFRI).

In light of the ecological sensitivity of the proposed project area, the Committee emphasized on the necessity of conducting a hydrological study to assess seasonal water availability, groundwater recharge potential, and long-term sustainability of River Kopra. Additionally, the EAC recommended a detailed review of the Wildlife Management Plan to ensure effective measures for protecting wildlife, restoring habitats, and reducing conflicts between humans and animals.

The EAC during the meeting noted that earlier the said project vide proposal no. IA/MP/RIV/241400/2021 dated 05.04.2022 submitted the its proposal for obtaining terms of reference, and the EAC considered the project in its meeting held on 09.05.2022 wherein the EAC deferred the project for want of following additional information:

(i) Report on alternate site analysis.
(ii) Report on impact of proposed project on forest and wildlife.
(iii) Report on impact and benefits of the proposed project.
(iv) Project PFR should be revised as per format prescribed in Office Memorandum No. J-11013/41/2006–IA.II (I) dated 30.12.2010.

Further, the EAC considered the same proposal on 15.06.2022, wherein PP did not attend the meeting. The information sought by the EAC in its meeting held on 09.05.2022, has been deliberated in detail in the current meeting and information found satisfactory.

26.3.4 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Standard ToR issued by the Ministry for conducting EIA/EMP study for Kopra Medium Irrigation Project (CCA: 9990 Ha) in an area of 1044.52 Ha at village Bamarakunj, Berkheri Kalan, Devpura, Kanmar, etc, Sub District Rehli, Garhakota, District Sagar, Madhya Pradesh by M/s Water Resources Division No One Sagar, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

3.3.5. Recommendation of EAC

Recommended

3.3.6. Details of Terms of Reference

3.3.6.1. Specific

Miscellaneous	
1.	Pre-DPR Chapters viz. Hydrology, Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
2.	Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
3.	Both capital and recurring expenditure under EMP shall be submitted.
4.	The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
5.	Arial view video of project site shall be recorded and to be submitted.
6.	As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
Muck Management:	
1.	Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
2.	Details of Muck Management plan prepared along with estimated cost incorporated in EIA/EMP report.
3.	Techno-economic viability of the project must be recommended from CEA/ CWC.
Socio-economic Study	
1.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical

	infrastructure etc. will be explored after assessing the need of the labour force and local population.
2.	Declaration by the Project Proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
3.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
4.	Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
5.	Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
6.	Details of settlement in 10 km area shall be submitted.
7.	Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
Environmental Management and Biodiversity Conservation	
1.	PP shall obtain NBWL Clearance in view of project submergence area falls in Nauradehi Wildlife Sanctuary and its Eco Sensitive Zone.
2.	Explore the possibilities for reducing the Forest land requirement.
3.	As the Dam site falls in the transition zone between the upland and plain land, the detailed aquatic biodiversity and their period of migration needs to studied.
4.	Prepare Wildlife conservation plan with mitigation measures for minimizing the human–animal conflict and be suitably incorporated in the wildlife conservation plan in consultation with reputed government expert institute and State Forest Department.
5.	Cumulative Impact of project on carrying capacity and sustainability of river of catchment area / due to lifting of water from river.
6.	Prepare Environmental Cost Benefit Analysis in terms of ecological damage due to diversion of Forest land/ loss of biodiversity and its impacts on ecosystem, water availability, water uses for generation of hydro power in study area 10 km from periphery of Project components.
7.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted and thermal stratification. Accordingly, Environment Management plan shall be prepared.
8.	Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/EMP report.
9.	Source of construction material and its distance from the project site along with detailed transportation plan for construction material be elaborated in the EIA EMP report. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.

10.	A detailed wildlife conservation plan for Schedule –I species, duly approved by the Chief Wildlife Warden, be submitted.
11.	In case any wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
12.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

3.3.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Scope of EIA Study	
1.	The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analysed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.
Details of the Project and Site	
1.	General introduction about the proposed project.
2.	Details of Project and site giving L-Sections of all U/S and D/S Projects with all relevant maps and figures. Connect such information as to establish the total length of interference of Natural River and the committed unrestricted release from the site of Dam/Barrage into the main river.
3.	A map of boundary of the project site giving details of protected areas in the vicinity of 25 km of project location.
4.	Location details on a map of the project area with contours indicating main project features. The project layout shall be superimposed on a contour map of ground elevation showing main project features (viz. location of dam, Head works, main canal, branch canals, quarrying etc.) shall be depicted in a scaled map.
5.	Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least 1:50,000 scale and printed at least on A3 scale for clarity.
6.	Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
7.	Drainage pattern and map of the river catchment up to the proposed project site.
8.	Delineation of critically degraded areas in the directly draining catchment on the basis of Silt Yield Index as per the methodology of Soil and Land use Survey of India.
9.	Soil characteristics and map of the project area.
10.	Geological and Seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and canal sites.
11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.

12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	
1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.
3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to,

	since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as follow s:	
1.	null
2.	null
3.	null
4.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
5.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
6.	Landslide zone or area prone to landslide existing in the study area should be examined.
7.	Presence of important economic mineral deposit, if any.
8.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
9.	Impact of project on geological environment.
10.	null
11.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
12.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.

13.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
14.	null
15.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
16.	null
17.	Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
18.	New configuration map to be given in the EIA Report
19.	null
20.	History of the ground water table fluctuation in the study area.
21.	Water Quality for both surface water and ground water for [i] Physical parameters (pH, Temperature, Electrical Conductivity, TSS); [ii] Chemical parameters (Alkalinity, Hardness, BOD, COD, NO3, PO4, Cl, So4, Na, K, Ca, Mg, Silica, Oil & grease, phenolic compounds, residual sodium carbonate);[iii] Bacteriological parameter (MPN, Total coliform); and [iv] Heavy Metals (Pb, As, Hg, Cd, Cr6,Total Cr, Cu, Zn, Fe) at minimum10 Locations, however, the sampling numbers should be increased depending on the command area.
22.	Delineation of sub and micro watersheds, their locations and extent based on the Soil and Land Use Survey of India (SLUSOI), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through Silt Yield Index (SYI) method of SLUSOI.
23.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
24.	Run off, discharge, water availability for the project, sedimentation rate, etc.
25.	Basin characteristics
26.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
27.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
28.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
29.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.

30.	Environmental flow release should be 20% of the average of the 4 lean months of 90% dependable year during the lean season and 30% of Monsoon flow during monsoon season. For remaining months, the flow shall be decided by the Committee based on the hydrology and available discharge.
31.	A site specific study on minimum environment flow should be carried
32.	null
33.	null
34.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
35.	General vegetation profile and floral diversity covering all groups of flora including Bryophytes, Pteridophytes, Lichens and Orchids. A species wise list may be provided.
36.	Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index [IVI], Shannon Weiner Index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrats, size of quadrats etc. to be reported within the study area in different ecosystems.
37.	Existence of National Park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
38.	Economically important species like medicinal plants, timber, fuel wood etc.
39.	Details of endemic species found in the project area.
40.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along with economic significance. Species diversity curve for RET species should be given.
41.	Fauna study and inventorisation should be carried out for all groups of animals including reptiles and nocturnal animals in the study area. Their present status along with Schedule of the species.
42.	Information (authenticated) on Avi-fauna and wild life in the study area.
43.	Status of avifauna their resident/migratory/ passage migrants etc.
44.	Documentation of butterflies, if any, found in the area.
45.	Details of endemic species found in the project area.
46.	RET species- voucher specimens should be collected along with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
4	Existence of barriers and corridors, if any, for wild animals.

7.	
48.	Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
49.	For categorization of sub-catchments into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catc
50.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplanktons, benthos etc.
51.	Fish and fisheries, their migration and breeding grounds.
52.	Fish diversity, composition and maximum length & weight of the measured populations to be studied for estimation of environmental flow.
53.	Conservation status of aquatic fauna.
54.	Cropping pattern and Horticultural practices in the study area.
55.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities component.
56.	Component of pressurized/drip irrigation and micro irrigation.
57.	Details of Conjunctive use of water for irrigation
58.	Collection of Baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers and surrounding population.
59.	Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.
60.	Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
61.	The Socio-economic survey/profile within 10 Km of the study area for Demographic profile; Economic Structure; Development Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.
62.	Documentation of Demographic, Ethnographic, Economic structure and development profile of the area
63.	Information on Agricultural practices, Cultural and aesthetic sites, Infrastructure facilities etc
64.	Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
6	List of all the Project Affected Families with their names, education, land holdings, other properties, occupation,

5.	source of income, land and other properties to be acquired, etc.
66.	In addition to Socio-economic aspects of the study area, a separate chapter on socio-cultural aspects based upon study on Ethnography of the area should be provided.
Impact Prediction and Mitigation Measures	
1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources
3.	Effect on soils, material, vegetation and human health
4.	Impact of emissions from DG sets used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustions in equipments & vehicles
6.	Fugitive emissions from various sources.
7.	Impact on micro climate
8.	Changes in surface & ground water quality. Steps to develop pisci-culture and recreational facilities.
9.	Changes in hydraulic regime and down stream flow.
10.	Water pollution due to disposal of sewage.
11.	Water pollution from labour colony/camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) [a] due to considerable road construction/widening activity [b] interference of reservoir with the inflowing streams [c] blasting for excavation of canals and some other structures
13.	Changes in land use/land cover and drainage pattern.
14.	Immigration of labour population.
15.	Quarrying operation and muck disposal.
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.

20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-Identification of suitable native tree species for compensatory afforestation & green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animal
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status.
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease.
29.	Impact on increases traffic.
30.	Impact on Holy Places and Tourism.
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and lead to landslides, damage to properties and drying up of natural springs and cause noise pollution, will be studied. Proper record shall be maintained of the base line information in the post project period.
32.	Positive as well as negative impacts likely to be accrued due to the project are to be listed.
Environment Impact Analysis	
1.	Environmental Impact Analysis due to the project on the above mentioned components should be carried out for construction and operation phases using qualitative or quantitative methods.
Environmental Management Plan	
1.	Environmental Management Plan aimed at minimizing the negative impacts of the project should be given in detail. The mitigation measures are to be presented for all the likely adverse impacts on the environment. The following suggestive mitigating plans should be included
2.	Biodiversity and Wild Life Conservation & Management Plan for conservation and preservation of endemic, rare and endangered species of flora and fauna to be prepared in consultation with State Forest Department.
3.	Compensatory Afforestation in lieu of the forest land required for the project needs to be proposed.Choice of plants should be made in consultation with State Forest Department including native and RET species, if any.

4.	Fisheries Conservation & Management Plan-Fish fauna inhabiting the affected stretch of river, a specific fisheries management plan should be prepared for river and reservoir.
5.	Plan for Green Belt Development along the periphery of reservoir, colonies, approach road, canals etc. to be prepared in consultation with the State Forest Department. Local plant species suitable for greenbelt development should be selected.
6.	Environmental Monitoring Programme with physical & financial details covering all the aspects of EMP. A summary of cost estimate for all the plans, cost for implementing all Environmental Management Plans including the cost for implementing environmental monitoring programme should be given. Provision for an Environmental Management Cell should be made.
7.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of area for treatment based upon Remote Sensing & GIS methodology and Silt Yield Index (SYI) method of SLUSOI coupled with ground survey. Areas/watersheds falling under 'very severe' and `severe' erosion categories are required to be treated. Both biological and engineering measures should be proposed in consultation with State Forest Department. Year-wise schedule of work and monetary allocation should be provided. CAT plan is to be completed prior to reservoir impoundment. Mitigations measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be include.
8.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. The results of the site specific earth quake design parameters should be approval by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
9.	Dam Break Analysis and Disaster Management Plan: The outputs of Dam Break Model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam break scenario. Provision for early warning systems should be provided.
10.	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.
11.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.
12.	Plan for Restoration of quarry sites and landscaping of colony areas, working areas, roads, etc.
13.	Command Area Development (CAD) Plan giving details of implementation schedule with a sample CAD plan.
14.	In the EMP, also include a sample CAD plan for a distributary outlet command. Such a plan is to show the alignment of irrigation and drainage channels. The components of the OFD works to be undertaken may be clearly mentioned along with a time schedule for their completion vis-à-vis the progress of irrigation development.
15.	Mitigating measures for impacts due to Blasting on the structures in the vicinity.
16.	Resettlement and Rehabilitation (R&R) Plan need to be prepared with due consultation with Project Affected Families (PAFs). The provision of the d R&R plan should be according to the National Resettlement and Rehabilitation Policy (NRRP-2007) as well as State Resettlement and Rehabilitation Policy. Detailed budgetary estimates are to be provided. Resettlements sites should be identified.
1	Public Health Delivery Plan including the provisions for drinking water facility for the local community.

7.	
18.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Panchayats. Local skill development schemes should be given. Details of various activities to be undertaken along with its financial out lay should be provided.
19.	Labour Management Plan for their Health and Safety.
20.	Sanitation and Solid Waste Management Plan for domestic waste from colonies and labour camps etc.
21.	Plan for Land Restoration and Landscaping of project sites.
22.	Energy Conservation Measures.
23.	Environmental safeguards during construction activities including Road Construction.
24.	Ground Water Management Plan.
25.	Water and Air Quality & Noise Management Plans to be implemented during construction and post-construction periods.

3.4. Agenda Item No 4:

3.4.1. Details of the proposal

Proposed Pachnad Major Irrigation Scheme by **Office of the Chief Engineer (Ramganga)** located at **AURAIYA,UTTAR PRADESH**			
Proposal For		Fresh ToR	
Proposal No	**File No**	**Submission Date**	**Activity (Schedule Item)**
IA/UP/RIV/499183/2024	J-12011/27/2024-IA-I(R)	23/10/2024	River Valley/Irrigation projects (1(c))

3.4.2. Project Salient Features

26.4.1 The proposal is for grant of Terms of Reference (TOR) for conducting EIA study for proposed Panchnad Major Irrigation Scheme (CCA : 24,328 Ha) in an area of 24328 Ha located at village Sadhrapur, Sub-District and District Auraiya, Uttar Pradesh by M/s Irrigation and Water Resource Department, Kanpur, Uttar Pradesh.

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

i. The word ‘Pachnad’ got mentioned incorrectly in the application for TOR, the same may be read as ‘Panchnad’. Panchnad Major Irrigation Scheme aims the stabilization of command area of Kuthond branch canal, which is part of Betwa canal system. The command area of the branch

canal considered to be stabilized is assessed to be 24,328 Ha.

ii. The stored water behind the barrage will be used for irrigating the command area of Kuthond branch canal to the extent of 57,170 Ha consisting of 24,327 Ha, 22,382 Ha and 10,461 Ha during Kharif, Rabi and Zaid seasons respectively. With provision for supply drinking water and reservoir fisheries development at Near Sadrapur Village, Ajitmal Tehsil, Auraiya District, Uttar Pradesh State.
iii. It also aims to provide 50 MCM of water from the reservoir for meeting the future drinking water needs of the area and develop reservoir fisheries.
iv. The project consists of construction of a Barrage, Pump House on the right side of barrage and a pressure main to drop water into Kuthond branch canal. Further the construction of barrage is planned in between Prayagraj and Delhi inland waterway. To facilitate the easy movement of vessels in this route navigation locks along with other necessary structures are contemplated to be incorporated in the layout of the Barrage. Since the command area considered for stabilization is already developed with necessary canal network and land development, no command area development is planned under the project.
v. The geographical co-ordinate of the project are 79^0 22' 9.30" E to 79^0 22' 19.90" E and 26^0 24' 48.60" N to 26^0 24' 23.90" N
vi. **Land requirement:** Land requirement for the project is approx. about 3 ha. for pump house and pressure main, approx. about 15 ha. for head works. Hence total actual land requirement for the project is about 18 ha.
vii. **Water requirement:** The total quantity of water required during construction period for the construction activities and colonies is estimated 205878.725 KL. The source of water will be used from the Yamuna Basin.The water consumption during operation phase is estimated to be 5.0 KLD for about 6 employees along with their families and the same would be provided by the local authorities.
viii. **Project Cost:** The estimated project cost is **Rs. 3201.70 Crore.**
ix. **Environmental Sensitive area:** There is one wildlife sanctuary i.e., National Chambal Wildlife Sanctuary within 15 km radius from the project site. River Yamuna is flowing within the project site.
x. **Alternative Studies:**

Reconnaissance survey through boat was conducted during 8th to 10th September 2022 in a stretch of 40 km of river from the confluence of River Yamuna and Chambal to Auraiya Ghat. On the basis of straight reach, low river width and suitability of River banks following three alternate locations were identified as barrage sites.

- Alternative-I: 1 km upstream of Bijalpur village site;
- Alternative-II: Bijalpur Village site; and
- Alternative-III: Sadrapur village site

A joint visit by a team of experts from Geological Survey of India (GSI), Central Water Commission (CWC), and IWRD of Go UP was conducted during 28th and 29th October 2022. During the visit it was found that the banks of river at Alternative-I location are not stable. Height of both the banks are lower than the HFL value and width of river is more compared to other two alternatives Hence, Alternative-I location was dropped.

Another joint visit by Design experts from CWC, Faridabad and IWRD of GoUP was undertaken during between 9th and 11th November 2022. During this visit Sadrapur (26^0 24' 45.24" N and 79^0 22' 11.10" E) i.e. Alternate-III site was finalized as the best feasible site for construction of proposed Panchnad Irrigation Scheme. The deepest bed level of river at proposed barrage axis is about 99.67 m. The pond level of barrage at this site is about 109.00 m

A joint visit by Hydrology expert from CWC and IWRD of GoUP was carried out during 19th to 21st December 2022. During this visit feasibility of lifting point on right bank at just upstream of proposed barrage was also explored and it was found that suitable site is available for construction of Pump House in the right bank instead of about 20 km upstream of barrage.

xi. **Details of Solid waste/ Hazardous waste generation/ Muck and its management:**

The excavated muck/soil/spoil is about1.7 Lakh Cum will be tested for suitability for formation of approach road. The spoil (stone) will be used for the purpose of concrete and revetment to approach roads laid from nearest habitation to the project site.

xii. Status of Litigation Pending against the proposal, if any. – No

xiii. The salient features of the project are as under:-

1. Project Details:

Name of the Proposal	**Proposed Panchnad Major Irrigation Scheme**
Location (Including coordinates)	Near Sadrapur village, Ajitmal Tehsil, Auraiya district, U.P. within the Geo coordinates of 79^0 22' 9.30" E to 79^0 22' 19.90" E and 26^0 24' 48.60" N to 26^0 24' 23.90" N in Yamuna basin
Inter- state issue involved	Yes
Seismic zone	Zone- III

2. Category Details:

Category of the project	Category - A
Provisions	Panchnad Irrigation Scheme (PIS)is mainly an irrigation project. The stored water behind the barrage will be used for irrigating the command area of Kuthond branch canal to the extent of 57,170 Ha consisting of 24,327 Ha, 22,382 Ha and 10,461 Ha during Kharif, Rabi and Zaid seasons respectively. With provision for supply drinking water and reservoir fisheries development
Capacity / Cultural command area (CCA)	24,328 Ha
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	---

3. ToR/EC Details:

Cost of project	Rs. 3201.70 Crore
Total area of Project	Catchments area - 2,49,852 sq. km at Barrage site Submergence area - 72.18 Sqkm (within river course and No submergence in other state at pond level) Culturable Command Area - 24328 Ha Gross command Area - 44403 Ha Gross Irrigated area (GIA) - 57170 Ha
Height of Dam from River Bed (EL)	28 m

Length of Tunnel/Channel	764.2 m (Total water way)
Details of Submergence area	7218 ha is submergence area and belongs to the Government, as the total submergence area is wit hin the river and area upto FTL on both banks of the river belongs to Government
Types of Waste and quantity of generation during construction/ Operation	The excavated muck/soil/spoil is about1.7 Lakh Cum will be tested for suitability for formation o f approach road.
E-Flows for the Project	---
Is Projects earlier studies in Cumulative Im pact assessment & Carrying Capacity studie s (CIA&CC) for River in which project loc ated. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for s ustaining river ecosystem.	No, (As per downstream requirement E-flow will be maintained.)

4. Muck Management Details:

No. of proposed disposal area/ (type of land F orest/Pvt. land)	No disposal is envisaged. The spoil (stone) wil l be used for the purpose of concrete and revet ment to approach roads, guide bunds and afflu x bunds laid from nearest habitation to the proj ect site.
Muck Management Plan	The spoil (stone) will be used for the purpose of concrete and revetment to approach roads, g uide bunds and afflux bunds laid from nearest habitation to the project site.
Monitoring mechanism for Muck Disposal	The spoil (stone) will be used for the purpose of concrete and revetment to approach roads, g uide bunds and afflux bunds laid from nearest habitation to the project site.

5. Land Area Breakup:

Private land	18 ha.
Government land/Forest Land	Forest Land – 1900 ha (National Chambal Wil dlife Sanctuary)
Submergence area/Reservoir area	Submergence area -7218 ha (Govt. Land)
Land required for project components	Land requirement for the project is approx. ab out 3 ha. for pump house and pressure main, a pprox. about 15 ha for head works. Hence tota l actual land requirement for the project is abo

	ut 18 ha.
Additional information (if any)	---

6. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/ No	Details of Certificate/Letter/Remarks
Reserve Forest/Protected Forest Land	No	
National Park	No	
Wildlife Sanctuary	Yes	About 1900 ha of National Chambal Wildlife Sanctuary is coming under submergence area for which application for NOC/ Permission from NBWL is already submitted to MoEF&CC.

7. Court case details:

Court Case	Nil
Additional information (if any)	---

8. Affidavit/Undertaking details:

Affidavit/Undertaking	Undertaking enclosed as Annexure-VI
Additional information (if any)	---

9. Miscellaneous

Particulars	Letter no. and date
Details of consultant	**Rightsource Industrial Solutions Pvt. Ltd., Hyderabad**
Project Benefits	The importance of irrigation is to increase agricultural output and employment. The proposed project is expected to provide employment in different activities such as construction, transportation and plantation activities during construction phase and subsequently in agriculture and agro and other industries. The total man power requirement for the construction period is 1000members. The area irrigated by the project is inhabited by Rural families and thus the project helps to improve the economic condition of Rural families in the command area of the project. The implementation of the project will improve the economic condition of about 50000 household members and majority of this population is dependent on agriculture.
Status of other statutory clearances	About 1900 ha of National Chambal Wildlife Sanctuary is coming under submergence area for which appli

	cation for NOC/ Permission from NBWL is already s ubmitted to MoEF&CC.
R&R details	Not applicable
Additional detail (If any)	---

26.4.3 Earlier, the proposal was considered by the EAC on 05.11.2024, wherein the EAC sought additional following information:

i. PP shall submit land use /land type pattern.
ii. In view of ecological sensitivity of the proposed project site the Sub-committee of EAC members shall conduct a site visit before making any recommendations to the project site.

In view of the one of the additional information sought by the EAC, a sub-committee of the EAC (RV&HEP) comprising following expert members conducted a site visit of the proposed project during 17.01.2025 to 19.01.2025:

i. Dr. J.A. Johnson, Expert Member & Senior Wildlife Scientist from WII, Dehradun
ii. Representative from Central Water Commission (CWC)
iii. Representative from MoEF&CC

The proposal was reconsidered by the EAC in its meeting held on 14.02.2025 wherein PP did not attend the meeting and deferred the proposal, However, the EAC deliberated on the observations of the sub-committee report and recommended the following:

a. The PP may undertake study to estimate the available sandbars, river islands, river sandbanks and river bed submergence area in Nation Chambal Sanctuary at different barrage height level/HFL viz. at 105 M, 107 M & 109 M; based on the modelling the PP may come with the barrage height, which cause less ecological impact to aquatic animals residing in National Chambal Sanctury for considering TOR. So that the appropriate barrage height with minimum disturbance to National Chambal Wildlife Sanctuary could be finalized.
b. Alternatively, the project proponent should explore the alternate barrage sites not less than 7 km downstream to the proposed barrage site so that backwater flow impacts on the National Chambal Wildlife Sanctuary, will be minimized.
c. Calculation of per day demand for lift irrigation from the Barrage and how much water depth will be available after lifting may be submitted. At the same time, it is also necessary to calculate how much time it will take naturally to reach the old level of water (before lifting) in the reservoir again.

It was opined by the EAC that PP shall submit additional details sought in EAC 18th meeting held on 05.11.2024 along with above mentioned information.

The PP vide communication dated 05.03.2025 submitted the additional information sought by the EAC. Point wise reply submitted by the PP as follows:

Query 1:The PP may undertake study to estimate the available sandbars, river islands, river sandbanks and river bed submergence area in Nation Chambal Sanctuary at different barrage height level/HFL viz. at 105 M, 107 M & 109 M; based on the modelling the PP may come with the barrage height, which cause less ecological impact to aquatic animals residing in National Chambal Sanctury for considering TOR. So that the appropriate barrage height with minimum disturbance to National Chambal Wildlife Sanctuary could be finalized.

Reply: 26.6 sqkm area of sand bed is available at pond level of 109.00 m. It is not possible to reduce the pond level because on reducing the pond level barrage storage capacity will decrease and water requirement will not be fulfilled as taken in the project. As a result project will not be feasible.

Query 2:Alternatively, the project proponent should explore the alternate barrage sites not less than 7 km downstream to the proposed barrage site so that backwater flow impacts on the National Chambal Wildlife Sanctuary, will be minimized.

Reply: For the proposed barrage, reconnaissance survey was conducted by the team from CWC Planning Circle, Faridabad out of which Sadarapur was found suitable for construction of barrage as Both the river banks are firm and their top levels are above R.L. 120 m i.e. more than 100 year HFL, in that region .River is flowing in a straight reach; no meandering is seen. Present site the most appropriate location of

Barrage Construction. So it in not possible to change the location of proposed barrage.

Query 3:Calculation of per day demand for lift irrigation from the Barrage and how much water depth will be available after lifting may be submitted. At the same time, it is also necessary to calculate how much time it will take naturally to reach the old level of water (before lifting) in the reservoir again.

Reply: For the lift irrigation purpose the discharge required is 650 cusec and. per day water requirement is 1.59 MCM. Water depth and discharge in the Yamuna river varies throughout the day so it is not possible to calculate the water depth and time it will take naturally to reach the old level of water (before lifting) in the reservoir again.

Query 4: PP shall submit land use /land type pattern.

Reply: Regarding the land use/land type pattern 3 Ha. land is used for pump house and pressure mains in addition to this 15 Ha. land is used for head works. So in total 18 Ha. land need to be acquired from the farmers/locals in Panchnad Irrigation Project. Beside this land, no other land will be required. There is a submergence area of 7218 Ha. which is confined within the banks of Yamuna River.

3.4.3. Deliberations by the committee in previous meetings

Date of EAC 1 :05/11/2024

Deliberations of EAC 1 :

18.2.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Panchnad Major Irrigation Scheme (CCA : 24,328 Ha) in an area of 24328 Ha located at village Sadhrapur, Sub-District and District Auraiya, Uttar Pradesh by M/s Irrigation and Water Resource Department, Kanpur, Uttar Pradesh.

The EAC noted that the all irrigation projects falls under Category B as per EIA Notification 2006 as amended. The command area of the project is 24,328 Ha, however, the project attracts the General Condition of EIA Notification 2006 as amended, as the proposed project cover area is falling within 10 km of inter-state Boundary and National Chambal Wildlife Sanctuary; hence, the project has to be appraised at Central Level as Category “A” project of item 1 (c) ‘River Valley projects’ of the Schedule to the EIA Notification, 2006.

The EAC raised concerned about the total land area is approx. about 3 ha. for pump house and pressure main, approx. about 15 ha for head works. So, total actual land requirement for the project is about 18 ha; whereas submergence area of 7218 ha is a government land and about 1900 ha of National Chambal Gharial Wildlife Sanctuary is coming under submergence area. The Sanctuary houses various endangered wildlife species specially Ghariyals. PP informed that an application for NOC/ Permission from NBWL is already submitted to MoEF&CC.

The EAC further noted that the inter-state boundaries of Uttar Pradesh - Madhya Pradesh - Rajasthan States are falling within the submergence area in Chambal River.

18.2.4 The EAC after detailed deliberations, deferred the proposal for want of following additional information:

i. PP shall submit land use /land type pattern.
ii. In view of ecological sensitivity of the proposed project site the Sub-committee of EAC members shall conduct a site visit before making any recommendations to the project site.

*The proposal was therefore **deferred** on the above lines.*

Date of EAC 2 :14/02/2025

Deliberations of EAC 2 :

24.4.3 The EAC deliberated on the observations of the sub-committee report and recommended the following:

a. The PP may undertake study to estimate the available sandbars, river islands, river sandbanks and river bed submergence area in Nation Chambal Sanctuary at different barrage height level/HFL viz. at 105 M, 107 M & 109 M; based on the modelling the PP may come with the barrage height, which cause less ecological impact to aquatic animals residing in National Chambal Sanctury for considering TOR. So that the appropriate barrage height with minimum disturbance to National Chambal Wildlife Sanctuary could be finalized.

b. Alternatively, the project proponent should explore the alternate barrage sites not less than 7 km downstream to the proposed barrage site so that backwater flow impacts on the National Chambal Wildlife Sanctuary, will be minimized.

c. Calculation of per day demand for lift irrigation from the Barrage and how much water depth will be available after lifting may be submitted. At the same time, it is also necessary to calculate how much time it will take naturally to reach the old level of water (before lifting) in the reservoir again.

Accordingly, it was opined by the EAC that PP shall submit additional details sought in EAC 18th meeting held on 05.11.2024 along with above mentioned information.

The detailed site visit report is annexed at Annexure-I.

3.4.4. Deliberations by the EAC in current meetings

26.4.4 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Panchnad Major Irrigation Scheme (CCA : 24,328 Ha) in an area of 24328 Ha located at village Sadhrapur, Sub-District and District Auraiya, Uttar Pradesh by M/s Irrigation and Water Resource Department, Kanpur, Uttar Pradesh.

The EAC in its meeting held on 05.03.2025 observed the following:

- The EAC noted that the all irrigation projects falls under Category B as per EIA Notification 2006 as amended. The command area of the project is 24,328 Ha, however, the project attracts the General Condition of EIA Notification 2006 as amended, as the proposed project cover area is falling within 10 km of inter-state Boundary and National Chambal Wildlife Sanctuary; hence, the project has to be appraised at Central Level as Category “A” project of item 1 (c) ‘River Valley projects’ of the Schedule to the EIA Notification, 2006.
- The EAC raised concerned about the total land area is approx. about 3 ha. for pump house and pressure main, approx. about 15 ha for head works. So, total actual land requirement for the project is about 18 ha; whereas submergence area of 7218 ha is a government land and about 1900 ha of National Chambal Gharial Wildlife Sanctuary is coming under submergence area. The Sanctuary houses various endangered wildlife species specially Ghariyals. PP informed that an application for NOC/ Permission from NBWL is already submitted to MoEF&CC.
- The EAC further noted that the inter-state boundaries of Uttar Pradesh - Madhya Pradesh - Rajasthan States are falling within the submergence area in Chambal River.

The EAC in the current meeting observed the following:

- Additional information submitted by the PP deliberated in detail in the present meeting and EAC raised concern over 1900 ha of National Chambal Wildlife Sanctuary is coming under submergence area which is a tri-state protected area is renowned for its diverse wildlife, including the critically endangered gharial, red-crowned roof turtle, and the endangered Ganges river dolphin.
- The EAC was of the view that if in case the pond level rises upto 109.00 m, then there would submergence of sandbars, river islands, river sandbanks and river bed which are the habitat and breeding nest of wildlife species. Therefore, PP shall carry out specific detailed study on effect of submergence area on endangered species in consultation with reputed government institution

and prepare mitigation plan for the same.

26.4.5 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Standard ToR issued by the Ministry for conducting EIA/EMP study for Panchnad Major Irrigation Scheme (CCA : 24,328 Ha) in an area of 24328 Ha located at village Sadhrapur, Sub-District and District Auraiya, Uttar Pradesh by M/s Irrigation and Water Resource Department, Kanpur, Uttar Pradesh, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

3.4.5. Recommendation of EAC

Recommended

3.4.6. Details of Terms of Reference

3.4.6.1. Specific

Miscellaneous.	
1.	Pre-DPR Chapters viz. Hydrology, Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.
2.	Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.
3.	Both capital and recurring expenditure under EMP shall be submitted.
4.	The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.
5.	Arial view video of project site shall be recorded and to be submitted.
6.	vi. As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.
Muck Management	
1.	Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.
2.	Details of Muck Management plan prepared along with estimated cost incorporated in EIA/EMP report.
3.	Techno-economic viability of the project must be recommended from CEA/ CWC.
Socio-economic Study	
1.	Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical

	infrastructure etc. will be explored after assessing the need of the labour force and local population.
2.	Declaration by the Project Proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
3.	All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
4.	Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
5.	Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.
6.	Details of settlement in 10 km area shall be submitted.
7.	Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.
Environmental Management and Biodiversity Conservation	
1.	PP shall obtain NBWL Clearance in view of project cover area is falling within 10 km of inter-state Boundary and National Chambal Wildlife Sanctuary.
2.	Impact of submergence due to construction of barrage on habitat of Gharial be studied through expert government institution.
3.	Explore the possibilities for reducing the Forest land requirement.
4.	Prepare Wildlife conservation plan with mitigation measures for minimizing the human–animal conflict and be suitably incorporated in the wildlife conservation plan in consultation with reputed government expert institute and State Forest Department.
5.	Prepare Environmental Cost Benefit Analysis in terms of ecological damage due to diversion of Forest land/ loss of biodiversity and its impacts on ecosystem, water availability, water uses for generation of hydro power in study area 10 km from periphery of Project components.
6.	A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted and thermal stratification. Accordingly, Environment Management plan shall be prepared.
7.	Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/EMP report.
8.	Source of construction material and its distance from the project site along with detailed transportation plan for construction material be elaborated in the EIA EMP report. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
9.	A detailed wildlife conservation plan for Schedule –I species, duly approved by the Chief Wildlife

	Warden, be submitted.
10.	In case any wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
11.	Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

3.4.6.2. Standard

1(c)	**River Valley/Irrigation projects**
Scope of EIA Study	
1.	The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analysed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.
Details of the Project and Site	
1.	General introduction about the proposed project.
2.	Details of Project and site giving L-Sections of all U/S and D/S Projects with all relevant maps and figures. Connect such information as to establish the total length of interference of Natural River and the committed unrestricted release from the site of Dam/Barrage into the main river.
3.	A map of boundary of the project site giving details of protected areas in the vicinity of 25 km of project location.
4.	Location details on a map of the project area with contours indicating main project features. The project layout shall be superimposed on a contour map of ground elevation showing main project features (viz. location of dam, Head works, main canal, branch canals, quarrying etc.) shall be depicted in a scaled map.
5.	Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least 1:50,000 scale and printed at least on A3 scale for clarity.
6.	Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
7.	Drainage pattern and map of the river catchment up to the proposed project site.
8.	Delineation of critically degraded areas in the directly draining catchment on the basis of Silt Yield Index as per the methodology of Soil and Land use Survey of India.
9.	Soil characteristics and map of the project area.
10.	Geological and Seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and canal sites.
11.	Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color Composite (FCC) generated from satellite data of project area.

12.	Land details including forests, private and other land.
13.	Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability
Description of Environment and Baseline Data	
1.	To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socioeconomic status etc. should be collected within 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline studies should be collected for 1 season (Preferably Monsoon season). Flora-Fauna in the catchment and command area should be documented. The study area should comprise of the following:
2.	(i) Catchment area up to the dam/barrage site.
3.	(ii) Submergence Area.
4.	(iii) Project area or the direct impact area should comprise of area within 10 km radius of the main project components like dam, canals etc.
5.	(iv) Downstream upto 10 km from the tip of the reservoir.
Details of the Methology	
1.	The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included. Study area should be demarcated properly on the appropriate scale map. Sampling sites should be depicted on map for each parameter with proper legends. For Forest Classification, Champion and Seth (1968) methodology should be followed.
Methodology for Collection of Biodiversity Data	
1.	The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
2.	The entire area should be divided in grids of 5kmX5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrates in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However, these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.
3.	The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to,

	since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.The conventional sampling is likely to miss the presence of rare, endangered and threatened (r.e.t.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to, since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature form the entire state can be referred to. Once a listing of possible r.e.t. species form the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of r.e.t. species should be provided in the EIA reports.
4.	The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).
Components of the EIA Study: Various aspects to be studied and provided in the EIA/EMP report are as follow s:	
1.	null
2.	null
3.	null
4.	Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
5.	Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National Committee of Seismic Design Parameters, Central water Commission, New Delhi for large dams.
6.	Landslide zone or area prone to landslide existing in the study area should be examined.
7.	Presence of important economic mineral deposit, if any.
8.	Justification for location & execution of the project in relation to structural components (dam /barrage height).
9.	Impact of project on geological environment.
10.	null
11.	Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
12.	Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials < 10 microns, Sulphur dioxide (SO2) and Oxides of Nitrogen (NOX) in the study area at 5-6 Locations.

13.	Existing Noise Levels and traffic density in the study area at 5-6 Locations.
14.	null
15.	Soil classification, physical parameters (viz., texture, Porosity, Bulk Density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) at @ one sample/ha of command area.
16.	null
17.	Generation of thematic maps viz, slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
18.	New configuration map to be given in the EIA Report
19.	null
20.	History of the ground water table fluctuation in the study area.
21.	Water Quality for both surface water and ground water for [i] Physical parameters (pH, Temperature, Electrical Conductivity, TSS); [ii] Chemical parameters (Alkalinity, Hardness, BOD, COD, NO3, PO4, Cl, So4, Na, K, Ca, Mg, Silica, Oil & grease, phenolic compounds, residual sodium carbonate);[iii] Bacteriological parameter (MPN, Total coliform); and [iv] Heavy Metals (Pb, As, Hg, Cd, Cr6,Total Cr, Cu, Zn, Fe) at minimum10 Locations, however, the sampling numbers should be increased depending on the command area.
22.	Delineation of sub and micro watersheds, their locations and extent based on the Soil and Land Use Survey of India (SLUSOI), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through Silt Yield Index (SYI) method of SLUSOI.
23.	Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
24.	Run off, discharge, water availability for the project, sedimentation rate, etc.
25.	Basin characteristics
26.	Catastrophic events like cloud bursts and flash floods, if any, should be documented.
27.	For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km2 year-1.
28.	Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
29.	Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.

30.	Environmental flow release should be 20% of the average of the 4 lean months of 90% dependable year during the lean season and 30% of Monsoon flow during monsoon season. For remaining months, the flow shall be decided by the Committee based on the hydrology and available discharge.
31.	A site specific study on minimum environment flow should be carried
32.	null
33.	null
34.	Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
35.	General vegetation profile and floral diversity covering all groups of flora including Bryophytes, Pteridophytes, Lichens and Orchids. A species wise list may be provided.
36.	Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index [IVI], Shannon Weiner Index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrats, size of quadrats etc. to be reported within the study area in different ecosystems.
37.	Existence of National Park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
38.	Economically important species like medicinal plants, timber, fuel wood etc.
39.	Details of endemic species found in the project area.
40.	Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along with economic significance. Species diversity curve for RET species should be given.
41.	Fauna study and inventorisation should be carried out for all groups of animals including reptiles and nocturnal animals in the study area. Their present status along with Schedule of the species.
42.	Information (authenticated) on Avi-fauna and wild life in the study area.
43.	Status of avifauna their resident/migratory/ passage migrants etc.
44.	Documentation of butterflies, if any, found in the area.
45.	Details of endemic species found in the project area.
46.	RET species- voucher specimens should be collected along with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
4	Existence of barriers and corridors, if any, for wild animals.

7.	
48.	Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
49.	For categorization of sub-catchments into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catc
50.	Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplanktons, benthos etc.
51.	Fish and fisheries, their migration and breeding grounds.
52.	Fish diversity, composition and maximum length & weight of the measured populations to be studied for estimation of environmental flow.
53.	Conservation status of aquatic fauna.
54.	Cropping pattern and Horticultural practices in the study area.
55.	Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities component.
56.	Component of pressurized/drip irrigation and micro irrigation.
57.	Details of Conjunctive use of water for irrigation
58.	Collection of Baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers and surrounding population.
59.	Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.
60.	Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
61.	The Socio-economic survey/profile within 10 Km of the study area for Demographic profile; Economic Structure; Development Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.
62.	Documentation of Demographic, Ethnographic, Economic structure and development profile of the area
63.	Information on Agricultural practices, Cultural and aesthetic sites, Infrastructure facilities etc
64.	Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
6	List of all the Project Affected Families with their names, education, land holdings, other properties, occupation,

5.	source of income, land and other properties to be acquired, etc.
66.	In addition to Socio-economic aspects of the study area, a separate chapter on socio-cultural aspects based upon study on Ethnography of the area should be provided.
Impact Prediction and Mitigation Measures	
1.	The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.
2.	Changes in ambient and ground level concentrations due to total emissions from point, line and area sources
3.	Effect on soils, material, vegetation and human health
4.	Impact of emissions from DG sets used for power during the construction, if any, on air environment.
5.	Pollution due to fuel combustions in equipments & vehicles
6.	Fugitive emissions from various sources.
7.	Impact on micro climate
8.	Changes in surface & ground water quality. Steps to develop pisci-culture and recreational facilities.
9.	Changes in hydraulic regime and down stream flow.
10.	Water pollution due to disposal of sewage.
11.	Water pollution from labour colony/camps and washing equipment.
12.	Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) [a] due to considerable road construction/widening activity [b] interference of reservoir with the inflowing streams [c] blasting for excavation of canals and some other structures
13.	Changes in land use/land cover and drainage pattern.
14.	Immigration of labour population.
15.	Quarrying operation and muck disposal.
16.	Changes in land quality including effects of waste disposal
17.	River bank and their stability
18.	Impact due to submergence
19.	Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.

20.	Pressure on existing natural resources
21.	Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors
22.	Compensatory afforestation-Identification of suitable native tree species for compensatory afforestation & green belt.
23.	Impact on fish migration and habitat degradation due to decreased flow of water
24.	Impact on breeding and nesting grounds of animal
25.	Impact on local community including demographic profile.
26.	Impact on socio-economic status.
27.	Impact on economic status.
28.	Impact on human health due to water / vector borne disease.
29.	Impact on increases traffic.
30.	Impact on Holy Places and Tourism.
31.	Impacts of blasting activity during project construction which generally destabilize the land mass and lead to landslides, damage to properties and drying up of natural springs and cause noise pollution, will be studied. Proper record shall be maintained of the base line information in the post project period.
32.	Positive as well as negative impacts likely to be accrued due to the project are to be listed.
Environment Impact Analysis	
1.	Environmental Impact Analysis due to the project on the above mentioned components should be carried out for construction and operation phases using qualitative or quantitative methods.
Environmental Management Plan	
1.	Environmental Management Plan aimed at minimizing the negative impacts of the project should be given in detail. The mitigation measures are to be presented for all the likely adverse impacts on the environment. The following suggestive mitigating plans should be included
2.	Biodiversity and Wild Life Conservation & Management Plan for conservation and preservation of endemic, rare and endangered species of flora and fauna to be prepared in consultation with State Forest Department.
3.	Compensatory Afforestation in lieu of the forest land required for the project needs to be proposed.Choice of plants should be made in consultation with State Forest Department including native and RET species, if any.

4.	Fisheries Conservation & Management Plan-Fish fauna inhabiting the affected stretch of river, a specific fisheries management plan should be prepared for river and reservoir.
5.	Plan for Green Belt Development along the periphery of reservoir, colonies, approach road, canals etc. to be prepared in consultation with the State Forest Department. Local plant species suitable for greenbelt development should be selected.
6.	Environmental Monitoring Programme with physical & financial details covering all the aspects of EMP. A summary of cost estimate for all the plans, cost for implementing all Environmental Management Plans including the cost for implementing environmental monitoring programme should be given. Provision for an Environmental Management Cell should be made.
7.	Catchment Area Treatment (CAT) Plan should be prepared micro-watershed wise. Identification of area for treatment based upon Remote Sensing & GIS methodology and Silt Yield Index (SYI) method of SLUSOI coupled with ground survey. Areas/watersheds falling under 'very severe' and `severe' erosion categories are required to be treated. Both biological and engineering measures should be proposed in consultation with State Forest Department. Year-wise schedule of work and monetary allocation should be provided. CAT plan is to be completed prior to reservoir impoundment. Mitigations measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be include.
8.	Study of Design Earthquake Parameters: A site specific study of earthquake parameters should be done. The results of the site specific earth quake design parameters should be approval by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.
9.	Dam Break Analysis and Disaster Management Plan: The outputs of Dam Break Model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam break scenario. Provision for early warning systems should be provided.
10.	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.
11.	Muck Disposal Plan- suitable sites for dumping of excavated material should be identified in consultation with the State Pollution Control Board and Forest Department. All Muck disposal sites should be minimum 30 m away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L- section/ cross section of muck disposal sites and approach roads to be given. Financial out lay for this may be given separately. Deatailed muck transportation plan delinating the path ways, number of trucks, quantity of muck to be transportated along with monitoring mechanism using latest technology, shall be prepared.
12.	Plan for Restoration of quarry sites and landscaping of colony areas, working areas, roads, etc.
13.	Command Area Development (CAD) Plan giving details of implementation schedule with a sample CAD plan.
14.	In the EMP, also include a sample CAD plan for a distributary outlet command. Such a plan is to show the alignment of irrigation and drainage channels. The components of the OFD works to be undertaken may be clearly mentioned along with a time schedule for their completion vis-à-vis the progress of irrigation development.
15.	Mitigating measures for impacts due to Blasting on the structures in the vicinity.
16.	Resettlement and Rehabilitation (R&R) Plan need to be prepared with due consultation with Project Affected Families (PAFs). The provision of the d R&R plan should be according to the National Resettlement and Rehabilitation Policy (NRRP-2007) as well as State Resettlement and Rehabilitation Policy. Detailed budgetary estimates are to be provided. Resettlements sites should be identified.
1	Public Health Delivery Plan including the provisions for drinking water facility for the local community.

7.	
18.	Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Panchayats. Local skill development schemes should be given. Details of various activities to be undertaken along with its financial out lay should be provided.
19.	Labour Management Plan for their Health and Safety.
20.	Sanitation and Solid Waste Management Plan for domestic waste from colonies and labour camps etc.
21.	Plan for Land Restoration and Landscaping of project sites.
22.	Energy Conservation Measures.
23.	Environmental safeguards during construction activities including Road Construction.
24.	Ground Water Management Plan.
25.	Water and Air Quality & Noise Management Plans to be implemented during construction and post-construction periods.

4. Any Other Item(s)

N/A

5. List of Attendees

Sr. No.	Name	Designation	Email ID	Remarks
1	Prof G J Chakrapani	Chairman, EAC	cha**********@gmail.com	
2	Dr Mukesh Sharma	Member (EAC)	muk***@iitk.ac.in	Absent
3	Dr Uday Kumar R Y	Member (EAC)	uda********@yahoo.com	
4	Dr J A Johnson	Member (EAC)	jaj@wii.gov.in	Absent
5	Dr J V Tyagi	Member (EAC)	jvt******@gmail.com	Absent
6	Shri Kartik Sapre	Member (EAC)	kar********@gmail.com	
7	Shri Ajay Kumar Lal	Member (EAC)	akl****@gmail.com	
8	Dr A K Sahoo	Member (EAC)	ami***@gmail.com	Absent
9	Shri Rajeev Varshney	Member	rva**********@gov.in	
10	Shri Balram Kumar	Member	emo***@nic.in	

11	Yogendra Pal Singh	Scientist - F	yog*******@nic.in	

MINUTES OF THE 26TH MEETING (VIRTUAL) OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 12TH MARCH, 2025

The 26th meeting of the EAC for River Valley & Hydro-electric Projects organized by the Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 12th March, 2025 (Virtual Mode), under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is at **Annexure**.

Confirmation of the Minutes of the 25th EAC meeting:

The Minutes of the Meeting held on 25th EAC meeting on 27th February, 2025 were confirmed.

Agenda Item No. 26.1

Kamod Close Loop Pumped Storage Hydro Electric Project (2000 MW) in an area of 395.23 Ha at Village Chaupale, Kamod, Lavhartodi, Kotkhamb and Nagziri, Sub District Sakri and Nawapur, District Dhule and Nandurbar, Maharashtra by M/s Megha Engineering & infrastructures Limited - Terms of References (TOR) – reg.

[Proposal No. IA/MH/RIV/525456/2025; F. No. J-12011/09/2025-IA.I (R)]

26.1.1: The proposal is for grant of Terms of References (TOR) to the project for Kamod Close Loop Pumped Storage Hydro Electric Project (2000 MW) in an area of 395.23 Ha at Village Chaupale, Kamod, Lavhartodi, Kotkhamb and Nagziri, Sub District Sakri and Nawapur, District Dhule and Nandurbar, Maharashtra by M/s Megha Engineering & infrastructures Limited.

26.1.2: The Project Proponent and the accredited Consultant M/s. R S Envirolink Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

i. Kamod Pumped Storage Project is a closed loop pumped storage scheme with newly proposed upper and lower reservoir. The upper reservoir is lies on Lavhartodi Village, Sakari tehsil of Dhule district whereas lower reservoir lies over Kamod Village, Nawapur tehsil of Nandurbar district of Maharashtra. Both the locations are well connected with the road infrastructure. The Kamod Pumped Storage Project is proposed with a rating of 2000 MW and with a storage capacity of 12000 MWh. This Project comprises 7 units of 250 MW each and 2 units of 125 MW each.

ii. The installed capacity of a pumped storage scheme is influenced by the requirements of daily peaking power requirements, flexibility in efficient operation of units, storage available in the reservoirs and the area capacity characteristics. The Project will generate 2000 MW by utilizing a design discharge of 609.72 Cumec and rated head of 371.00m. The

Kamod pumped storage Project will utilize 2200 MW to pump 13.22 MCM of water into the upper reservoir in 6.85 hours

iii. The geographical location of upper dam is Latitude 21°04'44.87"N, Longitude 73°57'6.42"E and for lower reservoir is Latitude 21°05'28.42"N, Longitude 73°56'24.46"E.

iv. Kamod Pumped Storage Project is a pumped storage scheme with an installed capacity of 2000 MW. The scheme of operation considered for the project is daily regulation to meet the demand of about 6 hours of peak power daily. Off-peak pumping hours are considered as 6.85 hours daily.

v. **Land requirement:** The total land requirement for proposed project is about 395.23 Ha, out of which 302.29 Ha is forest and about 92.94 Ha is non-forest land.

vi. **Demographic details in 10 km radius of project area :**

- There are two villages namely Kamod and Dapur located near the proposed project reservoir area, falling under the Nawapur and Sakri tehsils of Nandurbar and Dhule districts.
- Both villages have a predominantly tribal population, with the Bhil community comprising about 99% of the residents.
- Agriculture is the primary occupation in these villages. Due to limited irrigation infrastructure, farming largely depends on monsoons and rainwater. Commonly cultivated crops include millets, maize, and pulses.
- The Bhil community is known for its rich cultural heritage, often engaging in traditional dances, music, and festivals that celebrate their deep connection to nature.
- The project region, in particular, is home to unique Bhil dance forms and rituals that are integral to their cultural identity. These villages represent rural life in Maharashtra, showcasing communities deeply rooted in agriculture and rich cultural traditions.

vii. **Water requirement:** Kamod Close Loop Pumped Storage Hydro Electric Project will require 17.51 MCM for initial reservoir filling and thereafter ~ 2.84 MCM per year will be required on annual basis from Rangawali dam reservoir for restoring the storage capacity lost due to evaporation.

viii. **Project Cost:** The hard cost of the project has been estimated as Rs. 6860.83 Cr. The cost to completion of the project including Escalation and IDC has been worked out as Rs. 10219.0 Crores.

ix. **Environmental Sensitive area:** There is no Protected Area in the vicinity of the proposed project. Aner Dam WLS is 112 km far from the proposed project area.

x. MoU signed with Government of Maharashtra dated 26-09-2024.

xi. **Alternative Studies:** 6 alternative layouts have been prepared and compared for development of PSP.

Description		**Scheme - 1**	**Scheme - 2**	**Scheme - 3**	**Scheme - 4**	**Scheme - 5**	**Scheme - 6**
Lower Reservoir		LR-1	LR-2	LR-3	LR-4	LR-5	LR-6
FRL	EL	288.0	300.0	300.0	298.0	350.0	330.0
MDDL (Presently assumed deepest bed level)	EL	254.0	266.0	266.0	270.0	314.0	292.0
Gross Storage	MCM	17.49	17.6	18.6	15.15	16.4	18.3
Evaporation Loss	MCM	2.70	1.57	1.71	0.78	2.63	1.80
Live Storage	MCM	14.8	16.1	16.9	14.56	13.8	16.5
Upper Reservoir		UR-1	UR-2	UR-3	UR-4	UR-5	UR-6
FRL	EL	654.0	660.0	650.0	676.0	680.0	550.0
MDDL (Presently assumed deepest bed level)	EL	626.0	620.0	608.0	654.0	652.0	510.0
Gross Storage	MCM	14.8	45.8	20.0	15.53	16.6	18.8
Evaporation Loss	MCM	1.94	1.94	1.50	0.63	2.13	2.17
Live Storage	MCM	12.8	43.9	18.5	14.37	14.5	16.6
Required Power	MW	2000	2000	2000	2000	2000	2000
Rated Net Head	m	353.5	343.0	332.3	371	323.7	214.3
Discharge Requirement for given power & head	cumecs	648	668	689	609.72	708	1069
Live Storage required	MCM	14.0	14.4	14.9	13.22	15.3	23.1
Gross Storage Required	MCM	18.6	17.9	18.1	15.53	17.4	27.1
Summary							
Plant Capacity	MW	2000	2000	2000	2000	2000	2000
Generation Hours	Hrs	6	6	6	6	6	6
Total Design Discharge	cumec	648	668	689	609.72	708	1069
Total WCS Length	m	2750.0	3700.0	3400.0	1058.71	1800.0	1220.0
L/H		7.5	10.3	9.8	2.85	5.4	5.6
Rated Head	m	353.5	343.0	332.3	371.0	323.7	214.3
Land Requirement							
Total Land (Reservoir)	Ha	327.0	318.3	314.7	309.37	316.5	318.3

Upper reservoir Area	Ha	110.0	118.5	116.4	118.35	102.0	119.0
Lower reservoir Area	Ha	217.0	199.8	198.3	191.02	214.5	199.3
Forest Area	Ha	217.0	318.3	198.3	309.37	171.5	318.3
Private Land	Ha	110.0	0	116.4	0	145	0

Scheme is 4 is preferred and is the final selected alternative.

xii. Status of Litigation Pending against the proposal, if any. **No**

xiii. The salient features of the project are as under: -

1. Project details:

Name of the Proposal	Kamod Close Loop Pumped Storage Hydro Electric Project
Location (Including coordinates)	Lower Reservoir : Longitude: 73° 56' 24.46" E; Latitude: 21° 05' 28.42" N Upper Reservoir : Longitude: 73° 57' 6.42" E; Latitude: 21° 04' 44.87" N
Inter- state issue involved	No
Seismic zone	Zone-III

2. Category details:

Category of the project	A
Provisions	
Capacity / Cultural command area (CCA)	2000 MW
Attracts the General Conditions (Yes/No)	No
Additional information (if any)	Nil

3. Electricity generation capacity:

Powerhouse Installed Capacity	2000 MW
Generation of Electricity Annually	4161 MU
No. of Units	9 nos. (7X250 MW+2X125 MW)
Additional information (if any)	Nil

4. ToR/EC Details:

Cost of project	10219.0 Cr.
Total area of Project	395.23 ha
Height of Dam from River Bed (EL)	Lower Dam – 48.0 m Upper Dam –48.0 m
Length of Tunnel/Channel	1058.71 m
Details of Submergence area	309.37 ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	Not Applicable, as this is Closed Loop Pumped Storage Project (PSP)
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by b) EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

5. Muck Management Details:

No. of proposed disposal area/ (type of land-Forest/Pvt. land)	60 ha (Non-Forest Land)
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

6. Land Area Breakup:

Private Land	92.94 ha
Government land/Forest Land	302.29 ha
Submergence area/Reservoir area	309.37 ha
Land required for project components	85.86 ha
Additional information (if any)	Nil

7. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate / letter/ Remarks
Reserve Forest/Protected Forest Land	-	There is no Protected Area in the vicinity of the proposed project. Aner Dam WLS is approx. 112.0 km far from the proposed project area.
National Park	-	
Wildlife Sanctuary	-	

8. Court case details:

Court Case	Nil
Additional information (if any)	Nil

9. Miscellaneous

Particulars	Details
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : I(C) Address : 403, Bestech Chambers, Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Haryana - 122009 E-mail : ravi@rstechnologies.co.in Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	• Pumped storage hydropower is a modified

	use of conventional hydropower technology to store and manage energy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, comparing favorably to other energy storage technologies and thermal technologies. This effectively shifts, stores, and reuses energy generated until there is corresponding demand for system reserves and variable energy integration. This shifting can also occur to avoid transmission congestion periods, to help more efficiently manage transmission grid, and to avoid potential interruptions to energy supply. This is important because many of the renewable energy resources being developed (e.g., wind and solar) are generated at times of low demand and off-peak energy demand periods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions. • Further, pumped storage projects are critical to the national economy and overall energy reliability because it's: o Least expensive source of electricity, not requiring fossil fuel for generation o An emission-free renewable source o Balancing grid for demand driven variations o Balancing generation driven variations o Voltage support and grid stability Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and will result in upliftment of livelihood and socio-economic conditions.
Status of other statutory clearances	Forest Clearance - Online application seeking forest diversion for around 302.29 Ha after receipt of ToR Approval. Alongside, other

	statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

26.1.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Kamod Close Loop Pumped Storage Hydro Electric Project (2000 MW) in an area of 395.23 Ha at Village Chaupale, Kamod, Lavhartodi, Kotkhamb and Nagziri, Sub District Sakri and Nawapur, District Dhule and Nandurbar, Maharashtra by M/s Megha Engineering & infrastructures Limited.

The project/activity falls under Category A of item 1(c), 'River Valley Projects,' as per the Schedule of the Environmental Impact Assessment Notification, 2006, and requires appraisal at the central level by the sectoral EAC in the Ministry.

The EAC observed that the total land requirement for the Kamod Pumped Storage Project is estimated at 395.23 Ha, out of which 302.29 Ha is forest and about 92.94 Ha is non-forest land. However, the application for Stage-I Forest Clearance (FC) has not yet been submitted, necessitating further action from the Project Proponent. There is no Protected Area in the vicinity of the proposed project.

The EAC also noted that the project boundary is outside ESA of Western Ghats and as per information available on Parivesh Gujrat state boundary is 6 km away from the project boundary.

The EAC further noted that the total water requirement for the project is 17.51 MCM for initial reservoir filling and thereafter ~ 2.84 MCM per year will be required from Rangawali dam reservoir for restoring the storage capacity lost due to evaporation.

The EAC observed that the project boundary lies outside the Ecologically Sensitive Area (ESA) of the Western Ghats and, as per information available on Parivesh, the Gujarat State boundary is approximately 6 km away from the project site. However, the Committee raised ecological concerns regarding the long-term sustainability of water resources for the project. The total water requirement for the project is 17.51 MCM for initial reservoir filling, followed by an annual requirement of approximately 2.84 MCM from the Rangawali Dam reservoir to compensate for evaporation losses. The EAC expressed concern that the availability of water in the Rangawali Dam and the estimated surplus water may not be sufficient to ensure the long-term feasibility of the project. The Committee recommended that a detailed study be

undertaken by the PP to assess the hydrology of the area and evaluate water availability concerning project feasibility over the next 50 years.

During the meeting, the PP submitted that to assess water availability at Rangawali Dam, IMD data from 1973 to 2022 was analyzed. The data was used to estimate the average monthly and annual precipitation over the designated region. The EAC noted that the annual average rainfall is 699 mm, while the average monsoon rainfall (June–September) is 608.7 mm, which is significantly lower than the national annual average rainfall of India. Regarding water availability, the EAC further observed that the catchment area of the Rangawali Dam is 99.2 sq. km, with an estimated annual yield of 26.38 MCM during a 75% dependable year and 22.16 MCM during a 90% dependable year, against a live storage capacity of 12.89 MCM. The estimated surplus water during the monsoon is projected to be 13.49 MCM and 9.27 MCM for 75% and 90% dependable year assessments, respectively, against the project's seasonal requirement of 8.755 MCM. Given these figures, the EAC emphasized that the long-term sustainability of the water source should be critically evaluated, and necessary conservation measures should be implemented to mitigate the risk of water scarcity affecting the project's viability and the surrounding ecological balance.

The EAC raised concerns about water availability and its potential impact on the region's ecosystem. To ensure sustainability, the EAC recommended conducting a comprehensive Water Utilization Mapping within a 10 km radius of the project site. This study should include:

- Assessment of all surface water sources (rivers, lakes, reservoirs, and canals)
- Evaluation of groundwater availability (aquifer condition, recharge potential, and extraction levels)
- Mapping of existing water users (agriculture, industries, and domestic consumption)
- Analysis of seasonal variations in water availability
- Assessment of potential risk for depletion of water availability due to project installation

Additionally, the Project Proponent has submitted a Memorandum of Understanding (MoU) dated 31.07.2024, signed between the Department of Water Resources, Government of Maharashtra and M/s Megha Engineering & infrastructures Limited, granting in-principle approval for the establishment of the Kamod Pumped Storage Project with a capacity of 2000 MW.

26.1.4 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Specific ToR issued by the Ministry for Close Loop Pumped Storage Projects vide OM dated 14.08.2023 for conducting EIA study for proposed construction of the project for Kamod Close Loop Pumped Storage Hydro Electric Project (2000 MW) in an area of 395.23 Ha at Village Chaupale, Kamod, Lavhartodi, Kotkhamb and Nagziri, Sub District Sakri and Nawapur, District Dhule and Nandurbar, Maharashtra by M/s Megha Engineering & infrastructures Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR:

[A] Environmental Management and Biodiversity Conservation:

i. PP shall submit the Water Utilization Mapping within a 10 km radius of the project for sustainability of ecosystem of the region.

ii. Detailed action plan for large scale plantation of native species of plant sapling within 10 km radius of the project shall be prepared in consultation with State Forest Department. The monitoring mechanism to ensure the survival of saplings shall be finalised in consultation with ICFRE.

iii. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 302.29 Ha of forest land involved in the project shall be submitted within stipulated time.

iv. Muck disposal site and other components such as Township, site office, Stacking area and batching plant shall be located outside the forest area.

v. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.

vi. PP shall submit the detailed plan for filling the reservoir from the Rangawali dam along with necessary approval form water resource department.

vii. Transportation Plan for transporting construction materials shall be submitted.

viii. Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem due to diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power and Ecological flows.

ix. In view of presence of Tribal population in the study area a detailed social impact assessment study shall be conducted in consultation with expert government organization/institute.

x. The baseline data collection will cover the changes in biological and ecological profile of the region after monsoon with worst-case scenario study and critical mineral assessment.

xi. Calculation and values of GHGs (CO2, CH4 etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.

xii. The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report. Presence of any critical mineral zone in the proposed area be clarified from GSI.

xiii. Details of mineral zone, if any, in the study area, certified by Geological Survey of India or any other concerned Government Organization shall be submitted.The project area should not come up on any critical mineral zone, the same shall to be verified by GSI/NMDC.

xiv. Quantitative values of Impact modelling of environmental parameters shall be submitted for during construction and operation. Also, mitigation measures shall be submitted in terms of construction and operation phase.

xv. Conducting site-specific ecological study emphasizing on riverine ecology viz. fishes diversity, fish migration, habitat and aquatic biota due to construction PSP. Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.

xvi. Cumulative Impact of projects in the basin on carrying capacity and sustainability of Reservoir/ River /nala of catchment area due to tapping of water for filling reservoir shall be studied.

xvii. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Specific ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.

xviii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.

xix. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

xx. Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Indian Council of Agriculture Research (ICAR) Institutes/ Expert Govt. institutions and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.

xxi. Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI.

[B] Socio-economic Study

i. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

ii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. A comparative chart of issues raised by General Public during Public Hearing and commitments made by the Project Proponent will be prepared and submitted in the relevant chapter of EIA/EMP report.

iii. PP shall submit the credible documents to show the status of land acquisition w.r.t project site from/through the concerned State Government as required under Ministry's OM dated 7th October, 2014 for the project land to be acquired.

iv. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land (if any) shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. Budget earmarked for R&R, CSR shall not be included in the cost of EMP.

[C] Muck Management

i. Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.

ii. Details of muck management such as dumping sites and its locations, transportation plan along with monitoring mechanism for muck transportation, detailing the road map of project construction site/ indicating the distances from HFL, river, project construction site along with types of road etc.

iii. Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the river during the high discharge/ flood or monsoon period. Prepare plan for stabilization of muck disposal sites using biological and engineering measures to ensure that muck does not roll down the slopes and shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area.

iv. Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc.

[D] Disaster Management

i. Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrial ecosystem, within study area to be studied and be incorporated in EIA/EMP report.

ii. The muck dumping sites shall be located with a distance of 100 mts from HFL. The PP shall submit the detailed action plan for transportation of muck along with monitoring mechanism of movement of muck carrying trucks.

[E] Miscellaneous

i. Both capital and recurring expenditure under EMP shall be submitted.

ii. Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.

iii. The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.

iv. Drone video of project site shall be recorded and to be submitted.

v. Undertaking need to be submitted on affidavit stating that no activities has been started on the project site.

vi. Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project.

vii. Specific Terms of Reference (ToRs) issued by the Ministry vide Office Memorandum No. F. No. IA3-22/33/2022-IA.III dated 14.08.2023 for Pumped storage projects shall be used for preparation of EIA/ EMP reports.

viii. As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.

Agenda Item No. 26.2

Chakung Chu Hydroelectric Project (82.5 MW) in an area of 42.24 Ha at Village Meyong, Naga-Namgor, Sentam and Singchit, Sub District Mangan District North District, Sikkim by M/s Kundan Hydro (Gangtok) Private Limited - Terms of References (TOR) – reg.

[Proposal No. IA/SK/RIV/527111/2025; F. No. J-12011/10/2025-IA.I (R)]

26.2.1: The proposal is for grant of Terms of Reference (TOR) to the project for Chakung Chu Hydroelectric Project (82.5 MW) in an area of 42.24 Ha at Village Meyong, Naga-Namgor, Sentam and Singchit, Sub District Mangan District North District, Sikkim by M/s Kundan Hydro (Gangtok) Private Limited.

26.2.2 The Project Proponent and the accredited Consultant R. S. Envirolinks Technologies Pvt. Ltd., made a detailed presentation on the salient features of the project and informed that:

i. Chakung Chu Hydroelectric Project is a medium scale hydroelectric project, being developed in Chakung Chu nallah and Ri Chu (New Meyong Chu) nallah in Mangan (North) district in Sikkim, some 2 Km upstream of its confluence with the Teesta River near Tung bridge.

ii. Geographically, the proposed project area is stretched between latitude 27˚ 31' 47.38"N to 27˚ 32’ 59.32"N and longitude 88˚ 40’ 33.68"E to 88˚ 39' 12.64"E. The stretch of Chakung Chu valley along the project area is generally V-shaped with a number of tributaries in dendritic pattern. The area is thinly populated at river terraces, the land use is mostly covered by thin forest, and some cultivated land.

iii. Ri Chu nallah (New Meyong Chu) discharge has been utilized to develop the Chakung Chu Hydro Power Project. The Ri Chu diversion site is near about 12 Km from Mangan and 5.0 km from Chakung Chu diversion site. The Diversion site lies between latitude 27° 40’ 30’’ N (at Weir) Longitude 88° 30’ 00’’ E. Reference of Toposheet No is OSM G45E10/11. This diversion Site is proposed on Ri Chu Nallah near New Meyong Chu village on Right bank of Ri Chu Nallah.

iv. **Catchment Area:** The catchment area of the proposed scheme of Chakung Chu nallah lies between longitude of 88° 40’ E to 88° 48’ E and latitude of 27° 31’N to 27° 35’ N. Diversion site of Chakung Chu HEP is located at 27˚ 31' 47.38"N and 88˚ 40’ 33.68"E. The catchment area of Chakung Chu nallah up to the project site is 96.91 sq. km. The length of Chakung Chu from origin to the proposed diversion site is about 19.42 km with average slope of 1 in 7.

v. **Land requirement:** The total land required for the construction of various project components of Chakung Chu HEP is estimated to be around 42.24 ha, out of which 26.11 ha is forest land and 16.13 ha is non-forest land.

vi. **Demographic details in 10 km radius of project area:**

- The project vicinity is located near Tung Bridge in North Sikkim district. The study area has a Scheduled Tribe population of about 65%. Agriculture is the main occupation of the villagers, with crops such as millet, wheat, barley, and buckwheat being commonly grown. Traditional farming methods are widely practiced, and villagers often collaborate in the fields.
- The villages located in the study area, lies in the hilly terrain of North Sikkim. The villagers have adapted their homes and lifestyle to the mountainous environment. Agriculture remains their primary source of livelihood. The community is close-knit, and traditional practices are an important part of daily life.
- The Lepcha and Bhutia communities are among the major tribes in the study area. They have a rich cultural heritage, including their own languages, traditional dress, and unique social customs. Their festivals, such as Sonam Losar and Bumchu, are significant cultural events. They also perform traditional dances and rituals influenced by Tibetan Buddhism.
- Most houses in the villages are built using locally available materials such as wood and stone. The people follow a simple lifestyle, relying on farming and animal husbandry. Handicrafts and weaving are also common traditional skills among the villagers.

vii. **Water Availability**: Average Discharge of Chakung chu nallah at 90%, 75% and 50 % dependable year is 5.75, 6.44 and 7.83 cumecs respectively. Average Discharge of Ri chu (New Meyong chu) nallah at 90%, 75% and 50 % dependable year is 1.56, 1.69 and 1.91 cumecs respectively. The design discharge is 14.83 cumecs.

viii. **Project Cost:** The estimated project cost is Rs 695.09 crore.

ix. **Environmental Sensitive area:** Khangchendzonga is the nearest protected area at a distance of 5.3 km from the project site. ESZ boundary notified vide MOEF&CC's notification no. S.O.2166(E) dated 27th August 2014. The Eco-sensitive Zone varies from 25 m to 200 m from the boundary of the sanctuary. All project components are outside the protected area as well as ESZ. The diversion sites of the project are at Chakung Chhu and Ri Chhu, tributaries of Teesta River.

x. MoU signed with State Government on 9th September 2024.

xi. Alternative Studies: 3 schemes were selected for the study.

- Alternative I: RoR scheme with a diversion barrage.
- Alternative II: RoR scheme with a 55m high dam.
- Alternative III: Dam axis located 245m upstream of Alternative II.

Diversion and Contribution of Ri Chu is included in all these three alternatives.

Factor	Alternative I	Alternative II	Alternative III
Diversion Type	**Barrage** (115 m length, 21.50 m height)	Barrage being replaced by **a Dam** (55 m height) To accommodate 3 peaking hours.	**Dam** (245 m upstream of Alternative II) More excavation is required on both banks to accommodate the spillway block and increase capacity to safely pass flood discharge. Additionally, this option does not allow for the utilization of the discharge from the upstream nallah,
Water Conveyance	±2100 m HRT, ±1228 m penstock	Similar to Alt I, with dam instead of barrage	Increased HRT length due to nallah crossing
Powerhouse	Surface powerhouse with 71 m tailrace Channael	Same as Alt I	Complex due to narrow valley
Submergence (ha)	2.64	3.82	High
Peaking Storage	Yes(2 hours in one shift)	Yes (3 hours)	Yes (3 hours)
Construction Time	Moderate	High	Very High
Cost	Moderate	High	Very High
Geological Suitability	Favourable. Left bank is suitable for the foundations of the barrage, abutment, collection pool, approach conduit, desander chamber, and headrace pipe up to the portal. Surface geological studies of exposed	Layout for Alternative II is geologically similar to that of Layout Alternative I. Moderate (deep 20 m excavation required due to overburden)	Poor (high excavation impact)

	phyllite rock mass also indicate favourable conditions, with major discontinuity orientations along the HRT, surge shaft, and penstock areas extending to the powerhouse. Based on these findings, the site is geologically recommended as a suitable option.		
Environmental Impact	Minimum impact on flora and fauna of the area due to small structure with small pondage. Submergence area (2.64ha) and length of Reservoir 340.0 m	Moderate impact on flora and fauna due to high da, structure. Submergence area (3.82 ha) and maximum length of Reservoir 374.0 m	High impact on flora and fauna due to higher forest land involved.
Feasibility	**Selected as Best Alternative**	Considered but higher cost & complexity due to unfavorable geological conditions, as well as the higher cost and construction time associated with building a 55-meter-high dam, this alternative is deemed not feasible and is therefore not considered.	Same as Alternative II; Not suitable

xii. **Status of Litigation Pending against the proposal:**

The Special Leave Petition (SLP) filed by M/s Amalgamated Transpower (India) Ltd. vide Diary No. 34140/2023 is pending consideration before the Supreme Court against

Sikkim Power Development Corporation Ltd. regarding the cancellation of its contract for the development of hydroelectric projects.

xiii. The salient features of the project are as under:

1. Project details:

Name of the Proposal	Chakung Chu Hydro Electric Project
Location (Including coordinates)	Diversion Site 1: 88˚ 40’ 33.68"E to 88˚ 39'12.64"E 27˚ 31' 47.38"N to 27˚ 32’59.32"N Diversion Site 2: 88˚ 35’ 00"E to 88˚ 39'00"E 27˚ 28' 00"N to 27˚ 33’00"N
Inter- state issue involved	No
Seismic zone	Zone-IV

2. Category details:

Category of the project	A
Provisions	
Capacity / Cultural command area (CCA)	82.5 MW
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Nil

3. Electricity generation capacity:

Powerhouse Installed Capacity	82.5 MW
Generation of Electricity Annually	312.60 MU
No. of Units	3 nos. (2X33 MW+1X16.5 MW))
Additional information (if any)	Nil

4. ToR/EC Details:

Cost of project	695.09 Cr.
Total area of Project	42.24 ha
Height of Dam from River Bed (EL)	21.50 m
Length of Tunnel/Channel	2100 m (Diversion Site 1)

	2700 m (Diversion Site 2)
Details of Submergence area	2.64 ha
Types of Waste and quantity of generation during construction/ Operation	Muck from excavation, solid waste from labour colony and construction waste
E-Flows for the Project	E-flow will be released as per applicable guidelines. A provision of 20% of the average of lean months' (Dec to March) flows has been kept.
Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by b) EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No

5. Muck Management Details:

No. of proposed disposal area/ (type of land- Forest/Pvt. land)	4.95 ha
Muck Management Plan	Will be Provided in EIA/EMP report
Monitoring mechanism for Muck Disposal	Will be Provided in EIA/EMP report

6. Land Area Breakup:

Private Land	16.13 ha
Government land/Forest Land	26.11 ha
Submergence area/Reservoir area	2.64 ha
Land required for project components	39.60 ha
Additional information (if any)	Nil

7. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	Yes/No	Details of Certificate / letter/ Remarks
Reserve Forest/Protected Forest Land	---	Distance from nearest protected area (Khangchendzonga NP) is 5.30 Km, however, proposed project is outside the notified ESZ boundary of the sanctuary.
National Park	---	
Wildlife Sanctuary	---	

8. Court case details:

Court Case	The Special Leave Petition (SLP) filed by M/s Amalgamated Transpower (India) Ltd. vide Diary No. 34140/2023 is pending consideration before the Supreme Court against Sikkim Power Development Corporation Ltd. regarding the cancellation of its contract for the development of hydroelectric projects.
Additional information (if any)	Nil

9. Previous EC compliance and necessary approvals: Nil

10. Miscellaneous

Particulars	Details
Details of consultant	M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization) Certificate No : NABET/EIA/2225/RA0274 Validity : August 15, 2025 Contact Person : Mr. Ravinder Bhatia Name of Sector : River Valley and Hydroelectric Projects Category : A MoEF Schedule : I(C)

	Address : 403, Bestech Chambers, Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Haryana - 122009 E-mail : ravi@rstechnologies.co.in Land Line : (0124) 4295383 Cellular : (+91) 9810136853
Project Benefits	• Project will generate 312.60 MU annually in a 90% dependable year. • A number of marginal activities and jobs will be available to the locals during the construction phase. • Local Area Development, facilities in Education, medical, transportation, road network and other infrastructure. • An opportunity for small-scale and cottage industries to develop in the area
Status of other statutory clearances	Forest Clearance - Online application seeking forest diversion for around 26.11 Ha after receipt of ToR Approval. Alongside, other statutory clearances (as applicable) from State as well as Central government will be obtained post completion of Detailed Project Report.
R&R details	Details shall be evaluated during EIA/EMP Studies
Additional detail (If any)	Nil

26.2.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Chakung Chu Hydroelectric Project (82.5 MW) in an area of 42.24 Ha at Village Meyong, Naga-Namgor, Sentam and Singchit, Sub District Mangan District North District, Sikkim by M/s Kundan Hydro (Gangtok) Private Limited.

The project/activity falls under Category B of item 1(c), 'River Valley Projects,' as per the Schedule of the Environmental Impact Assessment Notification, 2006, as Khangchendzonga is the nearest protected area at a distance of 5.3 km from the project site and attracts general condition of the said Notification, therefore, requires appraisal at the central level by the sectoral EAC in the Ministry.

The EAC noted that Chakung Chu Hydropower Project is a run-of-the-river (RoR) project. The head works site of the project is located downstream of the confluence of Chakung Chu with Glong Chu, whereas the powerhouse site of the project is located near Tung bridge just downstream confluence of Chakung Chu with Teesta River. The design discharge is 14.83 cumecs.

The EAC observed that the total land required for the construction of various project components of Chakung Chu HEP is estimated to be around 42.24 ha, out of which 26.11 ha is forest land and 16.13 ha is non-forest land, However, the application for Stage-I Forest Clearance (FC) has not yet been submitted, necessitating further action from the Project Proponent.

The EAC also noted that Khangchendzonga is the nearest protected area, located 5.3 km from the project site. The Eco-Sensitive Zone (ESZ) boundary was notified through MOEF&CC's notification no. S.O. 2166(E) dated 27th August 2014, with the ESZ ranging from 25 meters to 200 meters from the sanctuary boundary. While the EAC acknowledged that all project components lie outside both the protected area and the ESZ, it recommended a detailed biodiversity impact assessment to local flora, fauna, and migratory species.

The EAC, through analysis of .kml files and videography presented by the PP the EAC suggested to conduct comprehensive risk analysis on potential disasters such as GLOFs and landslides in the region. Special protective measures must be incorporated into Environmental Management Plan (EMP) to mitigate these risks effectively.

The EAC observed that the Special Leave Petition (SLP) filed by M/s Amalgamated Transpower (India) Ltd. vide Diary No. 34140/2023 is pending consideration before the Supreme Court against Sikkim Power Development Corporation Ltd. regarding the cancellation of its contract for the development of hydroelectric projects.

26.2.4 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Standard ToR issued by the Ministry for conducting EIA study to the project for Chakung Chu Hydroelectric Project (82.5 MW) in an area of 42.24 Ha at Village Meyong, Naga-Namgor, Sentam and Singchit, Sub District Mangan District North District, Sikkim by M/s Kundan Hydro (Gangtok) Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

[A] Environmental Management and Biodiversity Conservation:

i. Environmental Cost Benefit Analysis shall be done in terms of loss of Forest ecosystem dueto diversion of Forest land/loss of biodiversity, water availability, water uses for generation of hydro power.
ii. The longitudinal connectivity/Free flowing sketch be provided in the EIA/EMP report.

iii. Environmental matrix during construction and operational phase needs to be submitted. Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.
iv. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature required to be cut for barrage creation and other project component.
v. Three season (Pre-monsoon, Monsoon and winter season) baseline data of all the environmental attributes including biological environment as mentioned in the Standard ToR shall be collected for preparation of EIA/EMP report.
vi. Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
vii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone)based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.
viii. A detailed wildlife conservation plan for Schedule –I species be prepared duly approved by the Chief Wild Life Warden be submitted.
ix. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located outside the Eco Sensitive Zone (ESZ) and Wildlife Sanctuary.
x. In case any Wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.
xi. Explore the possibilities to reduce forest area for the construction of proposed project.
xii. Conduct geological survey and find out availability of mineral in study area. Take Geological opinion from GSI regarding mineral zone in the project study area.
xiii. Density of forest and its types including tentative nos of tree felled during construction of the project and details of plants species to be planted under compensatory plantation be mentioned in Compensatory Afforestation Plan under EIA/EMP.
xiv. Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.Source of construction material and its distance from the project site along with detailed transportation plan for construction material.
xv. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.
xvi. Reservoir/ River banks protection plan all along the submergence need to be prepared andincorporated in EIA/ EMP.
xvii. Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.
xviii. Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation andother project component.
xix. Project impact on avi-fauna shall be studied and incorporated in EIA/ EMP report.

xx. The project proponent must also include information if any, on the critical mineral zone mining or potential in the projected area from Geological Survey of India /Mineral Exploration Corporation Ltd or similar such Government organizations.

[B] Socio-economic Study

i. Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.
ii. All the tasks including conducting public hearing shall be done as per the provisions of EIANotification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.
iii. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated30th September, 2020 shall be submitted.
iv. Social impact assessment for the tribal population and others be conducted.
v. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared. Details of settlement in 10 km area shall be submitted.
vi. Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

[C] Muck Management:

i. Details of quantity of muck generation component wise, types of muck (Excavation in tunnels, pressure shaft and powerhouse etc.) and disposal site/ transportation to be provided.
ii. Details of muck management such as dumping sites and its locations, transportation plan along with monitoring mechanism for muck transportation, detailing the road map of project construction site/ indicating the distances from HFL, river, project construction sitealong with types of road etc.
iii. Details of water sprinkling arrangements for arresting the fugitive / dust, emission from transportation and other project activities in project construction area.
iv. Safety measures for avoiding spill over muck into the riverbed/streams and its flow into the river during the high discharge/ flood or monsoon period. Prepare plan for stabilization of muck disposal sites using biological and engineering measures to ensure that muck does notroll down the slopes and shall be disposed safely and that it does not pollute the natural streams and water bodies in surrounding area.
v. Restoration plan for construction area including dumping site of excavated materials bylevelling, filling up of burrow pits, landscaping etc.

[D] Disaster Management

i. PP shall conduct comprehensive studies on potential disasters such as GLOFs and landslides in consultation with reputed government institutions. Additionally, special protective measures must be incorporated into the EIA/EMP report.

ii. CAT plan, Dam break analysis, Disaster Management Plan and Fisheries Management Planbe prepared along with other EMPs and incorporated in the EIA/EMP report.

iii. Impact of Project activities (specially blasting and drilling) on the aquatic and terrestrialecosystem, within study area to be studied and be incorporated in EIA/EMP report.

[E] Miscellaneous

i. Pre-DPR Chapters viz., Hydrology, Layout Map and Power Potential Studies duly approvedby CWC /CEA shall be submitted.

ii. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.

iii. Both capital and recurring expenditure under EMP shall be submitted.

iv. The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports andcertificates of the labs which will analyse the samples.

v. Aerial view video of project site shall be recorded and to be submitted.

vi. Detailed plan to restore wider roads and convert them into narrow up to 10m after construction of the project shall be submitted.

vii. As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.

<u>Agenda Item No. 26.3</u>

Kopra Medium Irrigation Project (CCA: 9990 Ha) in an area of 1044.52 Ha at village Bamarakunj, Berkheri Kalan, Devpura, Kanmar, etc, Sub District Rehli, Garhakota, District Sagar, Madhya Pradesh by M/s Water Resources Division No One Sagar –Terms of References (TOR) – reg.

[Proposal No. IA/MP/RIV/524621/2025; F. No. J-12011/11/2022- IA.I (R)]

26.3.1: The proposal is for grant of Terms of Reference (TOR) to the project for Kopra Medium Irrigation Project (CCA: 9990 Ha) in an area of 1044.52 Ha at village Bamarakunj, Berkheri Kalan, Devpura, Kanmar, etc, Sub District Rehli, Garhakota, District Sagar, Madhya Pradesh by M/s Water Resources Division No One Sagar.

26.3.2: The Project Proponent and the accredited Consultant M/s Enviro Infra Solutions Pvt Ltd, made a detailed presentation on the salient features of the project and informed that:

i. Madhya Pradesh Water Resource Department, Tulsi Nagar, Bhopal, Madhya Pradesh is the inherent project proponent. The Madhya Pradesh Water Resources Department (MPWRD). River Kopra is a tributary of river Sonar ultimate part of KEN Sub Basin. The river Kopra originates near village Gopalpura of Tehsil Deori, District Sagar.

ii. **Project Location**: The Proposed dam site is located across river Kopra near village-Bagaspura, Tehsil-Rehli, District-Sagar of Madhya Pradesh, at Latitude: 23°36'22" N, Longitude: 79° 10'13" E and at a distance of 60 Km from Sagar on Sagar-Rehii-Jabalpur road up to Chhirari then 4 Km up to Bagaspura on Chhirari Baleh road. Topo Sheet No. of the proposed site is 55 M/2.

iii. **Project Background**

Since, there is no major project is being constructed on Sonar River or its tributaries until date. The construction of this project would help in maximum utilization of water in concerned areas facing a high scarcity of water for irrigation, resulting to the development of the area. This project will also provide water for drinking purpose to the rural area situated in nearby area and would promote the development of more industries in the nearby area.

iv. The project lies on the western periphery of Nauradehi Sanctuary Muhli range. So its importance for Nauradehi Sanctuary is rather more than the irrigation benefits of the project. The long spreaded Nauradehi Sanctuary area is facing severe scarcity of water for its wildlife especially during summer. The construction of this project will provide assured water availability to Nauradehi wild life and a water wall between Sanctuary and peripheral civil habitation. The Ken basin specially known suitability for crocodiles, the Kopra reservoir may be used as a good breeding center and crocodile Sanctuary along with all other aquatic life.

v. Further, the command area identified under Kopra Medium Project lies in the deep black cotton soils and is water scarce region of Ken Sub basin. This project will definitely bring economic prosperity to this area due to increased agricultural activities by fulfilling the demand of irrigation water required by farmers.

vi. Though not planned, many other incidental benefits like recharge of ground water in command area, development of agro based industries/food processing units, employment generation in construction phase and afterwards, development of tourist spots, etc. will be benefitted from the project. This will result in upliftment of socio - economic condition of people living in water scarce areas of Rehli Tehsil of Sagar district of Madhya Pradesh State. This will provide annual irrigation to about 9990 Ha.

vii. The Kopra Medium Project envisages construction of an earthen dam with Side Spill Way, pump house on Submergence with rising main. Dam is constructed 1620.00 M long Dam with a maximum height of 23.81 M. The 82.50 M long Side Spillway & 30 m NOF including key wall (on both side) with 6 Nos radial gates (including 1 standby) of size 11.00 M x 6.00 M with a maximum discharging capacity of 1597.69 Cumecs.

viii. **Land requirement:** Submergence Area-1044.52 ha. Area for dam and canal system is 1037.39 Ha.

Detail of Submergence Area:

Private land	712.62 Ha.
Government land	59.90 Ha.
Forest land	272.00 Ha.
Total	**1044.52 Ha.**

Further Land needed for Unit II canal is 1.15 ha Forest land and Temporary land acquisition 10 ha.

ix. **Demographic details in 10 km radius of project area:** The human population in Sagar district of Madhya Pradesh will be benefited due to the assured irrigation supply. The total population as per 2011 census in Sagar district is 15.5 lakhs with male and female population as 8.00 and 7.5 lakh resp. Most of this population is dependent entirely on Agriculture which is mainly rain fed at present. Due to the construction of this Dam this sizeable population depending on agriculture in the command areas will be benefitted due to increased agricultural activities.

x. **Water requirement:**
The quantity of water required during construction is estimated as 70 KLD which shall be drawn from the Kopar river water can be pumped and stored in a tank at higher elevation. The domestic requirement shall be 40 KLD which shall be met from the ground water resource. Post construction the domestic requirement shall be 5 KLD only.

xi. **Project Cost:** The estimated project cost is Rs 292.37 Cr.

xii. **Project Benefit:** Total Employment will be 100 persons as direct & 10 persons during operation stage. The project authority proposes to allocate Rs. 4.38 Cr. @ of 1.5% towards CER (as per Ministry's OM dated 1st May 2018).

xiii. **Environmental Sensitive area**: The project submergence area falls in Nauradehi Wildlife Sanctuary and its Eco Sensitive Zone (268.39 ha)

xiv. **Scheduled -I species:** Crocodile and Indian Peafowl. Further investigation will be done during EIA study.

xv. **Alternative Studies:** Three alternative sites were studied and Option No. I is considered best out of three alignments. Option No. 1 for planning is the best option as per the feasibility study. Other options do not seem to be suitable from the technical, economic, social and environmental point of view in view of displacement, submergence of forest and agricultural land.

Sl. No.	Details of Alternative	Capacity of reservoir (MCM)	Submergence area in Ha	Affected Forest land in ha.
1.	Alignment 1	48.43	1044.52	272
2.	Alignment 2	48.43	1083.47	293.92
3.	Alignment 3	48.93	1195.57	402.04

The above three options were discussed by Chief Engineer Dhasan Ken Kachhar Water Resources Department and Superintending Engineer Water Resources Division Sagar and they came to the conclusion that the proposal of Option No. 1 is best option**.**

xvi. **Details of Solid waste/ Hazardous waste generation/ Muck and its management:**

- Solid waste - During construction phase, labour colonies are proposed to be located at various locations, close to major construction sites. About 100 laborers and 10 technical staff are likely to congregate in the area during construction phase. The average per capita solid waste generated is of the order of 210 gm/day/person.
- Spoil, overburden or mine wastes - In this project, it is proposed to collect the construction waste from various construction sites, and disposed at sites identified in consultation with the district administration. Various construction sites would be properly leveled. The leveling or reclamation of various construction sites shall be made mandatory for the contractor, involved in the construction work. The details of the same shall be covered as a part of EMP to be presented as a part of the EIA report.
- Hazardous wastes & Other industrial process wastes - NA
- Construction or demolition wastes - Construction waste from various construction sites will be disposed at sites identified in consultation with the district administration.
- Agricultural wastes - The proposed project envisages enhancement of irrigation intensity in the CCA of 9990 ha in Sagar district, Madhya Pradesh, which will increase agriculture-production, there by increasing agricultural waste. Appropriate measures for the reuse and recycling of agricultural waste will be suggested as a part of the EMP study.

xix. The salient features of the project are as under:-

1. Project Details

Name of the Proposal	Kopra Medium Irrigation Project Proposal No :IA/MP/RIV/524621/2025 File No :J-12011/11/2022- IA.I (R)
Location (Including Coordinates)	Near Village Badarchua, Tehsil Rehli, District Sagar, M.P. Coordinates of Dam Site 23° 36'22"N,79°10'13"E
Inter- state issue involved	Not Applicable
Seismic zone	Zone II

2. Category Details:

Category of the project	Category 'A'
Provisions	New Irrigation Project
Capacity / Cultural command area (CCA)	CCA = 9990 ha
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	Submergence area of the project lies in Nauradehi Wildlife Sanctuary and its Eco sensitive zone (Forest area in NWS: 268.39 ha).

3. Electricity Generation Capacity: Nil

4. ToR/ EC Details:

Cost of project	Rs. 292.37 Crore
Total area of Project	Submergence Area = 1044.52 ha Culturable Command Area = 9990 ha
Height of Dam from River Bed (EL)	23.81m
Length of Tunnel/Channel	NA
Details of submergence area	The submergence area at FRL is 1044.52 ha. The non-forest area under submergence area is 772.52 ha and forest land 272 ha

Types of Waste and quantity of generation during construction / Operation	• Solid waste - During construction phase, labour colonies are proposed to be located at various locations, close to major construction sites. About 100 laborers and 10 technical staff are likely to congregate in the area during construction phase. The average per capita solid waste generated is of the order of 210 gm/day/person. • Spoil, overburden or mine wastes - In this project, it is proposed to collect the construction waste from various construction sites, and disposed at sites identified in consultation with the district administration. Various construction sites would be properly leveled. The leveling or reclamation of various construction sites shall be made mandatory for the contractor, involved in the construction work. The details of the same shall be covered as a part of EMP to be presented as a part of the EIA report. • Hazardous wastes & Other industrial process wastes - NA • Construction or demolition wastes - Construction waste from various construction sites will be disposed at sites identified in consultation with the district administration. • Agricultural wastes - The proposed project envisages enhancement of irrigation intensity in the CCA of 9990 ha in Sagar district, Madhya Pradesh, which will increase agriculture-production, there by ncreasing agricultural waste. Appropriate measures for the reuse and recycling of agricultural waste will be suggested as a part of the EMP study.
E-Flows for the Project	• Catchment area at dam site is 231.80sq km and average rainfall in upstream is 1100 mm. • Total 75% dependable virgin yield is computed as 52.00 MCM using R-R

	Relationship. • Upstream utilization has been estimated as 9.011 MCM; making net yield at dam site as 42.989 MCM. 99% of the yield is contributed by monsoon flow and only about 1% yield will be come from non-monsoon period. • Therefore, to mitigate the impact of reduced flow or drying up of the river downstream of the dam; the project is designed with live storage / proposed utilization of 41.24 MCM, and remaining water from monsoon contribution will be continuously discharged for downstream users. • The quantum works out to be 1.749 MCM water available in pre-project conditions. • Therefore, no additional environment flow is required to be released during monsoon period. • To ensure that downstream conditions do not change during non-monsoon period, entire discharge of non-monsoon period i.e.1.749MCM is recommended to be released as environmental flow.
Is Projects earlier studied in Cumulative Impact assessment & Carrying Capacity studies(CIA&CC) for River in which project located. If yes then E-flow with TOR / Recommendation by EAC as per CIA&CC study of River Basin. If not the E-Flows maintain criteria for sustaining river ecosystem.	No (Explained above)

5. Muck Management Details

No. of proposed disposal area / (type of land- Forest / Pvt land)	Nil • Muck generated from dam's foundation shall be utilized for earthen

	dam, producing coarse and fine aggregate for concrete production and in fillings for developing areas for construction facilities. • Muck generated from laying pipe line network will be utilized for refilling of the trenches and the approach road proposed to be constructed along the canal. Also, the surplus soil requiring disposal will be spread on low lying farmers field with their consent, spread along the route in the low lying areas, laid in the community undulating area of the connected villages with the consent of concerning Gram-panchayat or Janpad Panchayat. • The muck may also be used by nearby Gram Panchayats for construction of village roads etc.
Muck management plan	• Muck generated from dam's foundation after assuming swell factor of 25% has been estimated as 35,84,075.00 cum which shall be utilized for earthen dam, producing coarse and fine aggregate for concrete production and in fillings for developing areas for construction facilities. • Muck requiring disposal from pipeline has been estimated as 2,18,750.00cum. • The total muck so generated will be utilized for refilling of the trenches and construction of other structures.
Monitoring mechanism for Muck Disposal Transportation	Contractor and WRD

6. Land Area Breakup:

Total Private land	712.62 ha

Total Government Land / Forest Land	59.90 ha (Government Revenue Land), 272 ha Forest Land
Submergence area / Reservoir area	1044.52 ha (Out of which 712.62 ha Private Land, 59.90 ha Government Land and 272 ha Forest Land)
Land required for project Components (Part of Submergence area)	3.5 ha
Total Land Requirement	1044.52 ha

7. Presence of Environmentally Sensitive Areas in the Study Area:

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/No**	**Details of Certificate/ letter/ Remarks**
Reserve Forest / Protected Forest Land	Yes	3.61 ha under DFO South Sagar (MP)
National Park	No	
Wildlife Sanctuary	Yes	268.39 Ha under DFO Nauradehi Letter No./2021/3721 dated 24/11/2021

8. Court Cases Details: Nil

9. Previous EC compliance and necessary approvals:

Particulars	**Letter No. and Date**
Certified EC compliance report (if applicable)	NA
Status of Stage- I FC	Stage I proposal submitted vide Proposal No. FP/MP/IRRIG/143864/2021
Additional detail (If any)	Application for Wildlife clearance is under Process with application number WL/MP/IRRIG/509017/20124
Is FRA (2006) done for FC-I	Yes

10. Miscellaneous :

Particulars	**Details**
Details of consultant	Enviro Infra Solutions Pvt. Ltd., Ghaziabad QCIQCI No. 68 as per March, 2025, NABET/EIA/2225/RA 0300 Valid: November 27 2025

Project benefit	• Annual Rabi irrigation of 9990 ha • Development of fisheries in the reservoir • Employment to around 80 local labour during construction period. 5 MCM Drinking water to Rehli Blocks and 7.19 MCM for survival of wildlife of Nauradehi wildlife sanctuary
Status of other statutory clearance	Forest and Wildlife Clearances are under process
R&R details	• There are 180 families to be displaced and rehabited hence R&R plan will be prepared as per Rehabiliatation and resettlement act 2013. Land of 13 villages is coming under submergence. Private and Govt. Land near to the project site is proposed to be identified and acquired. • The Rehabilitation and Resettlement Plan has been prepared to comprehensively address the issues arising out of land acquisition, assessment of land/house/asset coming under acquisition, estimation of extent of loss and compensation to be offered in line with The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCT_LARR). `Total budget allocated for LA, R&R is Rs. 142.36 Crore.

26.3.3 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR for conducting EIA study for Kopra Medium Irrigation Project (CCA: 9990 Ha) in an area of 1044.52 Ha at village

Bamarakunj, Berkheri Kalan, Devpura, Kanmar, etc, Sub District Rehli, Garhakota, District Sagar, Madhya Pradesh by M/s Water Resources Division No One Sagar.

The EAC noted that the present project proposal comes under "B2" category; as CCA is 9990 HA which is less than 10,000 Ha, hence, only EMP is required as per the provisions of the EIA Notification, 2006, as amended. However, due to project submergence area falls in Nauradehi Wildlife Sanctuary and its Eco Sensitive Zone, the project will be appraised at central level as Category 'A' project.

The total land requirement for the project is 1044.52 Ha, out of which 272.00 Ha is forest land, 712.62 Ha is private land and 59.90 Ha is a government land. It was noted that the application for Stage-I Forest Clearance for the diversion of 272 ha Forest land was submitted to MoE&FCC vide letter No. FP/MP/lRRIG/143864/2021, Date 29/06/2021.

The proposed Kopra Medium Project is proposed on River Kopra near Badarchuwan village of Rehli Tehsil,district Sagar. The project is envisaged to have a live storage capacity of 41.24 MCM. PP submitted that the Catchment area of the river at dam site is 231.80 Km^2, 75% dependable yield is worked out 52.00 MCM , Designed flood is worked out to be 1597.69 Cumec and Sagar district is in Earthquake Zone-II.

The EAC observed that the PP has informed that Submergence area of the project lies in Nauradehi Wildlife Sanctuary and its Eco sensitive zone, declared through Notification S.O. 3133(E) dated 26.09.2017 (Forest area: 268.39 ha) under DFO Nauradehi Letter No./2021/3721 dated 24/11/2021. Nauradehi Wildlife Sanctuary has been experiencing severe water scarcity, particularly during the summer months, posing a significant challenge to the sustenance of its wildlife. The proposed project is expected to play a crucial role in ensuring a consistent water supply to the sanctuary. The EAC underscored the need for stringent environmental safeguards to minimize potential ecological disruptions.

Additionally, the EAC took note that the application for wildlife clearance (Application No. WL/MP/IRRIG/509017/20124) is currently under process, having been submitted on 20.12.2024. The project proponent informed that a Wildlife Management Plan has been prepared by the State Forest Research Institute (SFRI).

In light of the ecological sensitivity of the proposed project area, the Committee emphasized on the necessity of conducting a hydrological study to assess seasonal water availability, groundwater recharge potential, and long-term sustainability of River Kopra. Additionally, the EAC recommended a detailed review of the Wildlife Management Plan to ensure effective measures for protecting wildlife, restoring habitats, and reducing conflicts between humans and animals.

The EAC during the meeting noted that earlier the said project vide proposal no. IA/MP/RIV/241400/2021 dated 05.04.2022 submitted the its proposal for obtaining terms of reference, and the EAC considered the project in its meeting held on 09.05.2022 wherein the EAC deferred the project for want of following additional information:

(i) Report on alternate site analysis.
(ii) Report on impact of proposed project on forest and wildlife.
(iii) Report on impact and benefits of the proposed project.

(iv) Project PFR should be revised as per format prescribed in Office Memorandum No. J-11013/41/2006–IA.II (I) dated 30.12.2010.

Further, the EAC considered the same proposal on 15.06.2022, wherein PP did not attend the meeting. The information sought by the EAC in its meeting held on 09.05.2022, has been deliberated in detail in the current meeting and information found satisfactory.

26.3.4 The EAC based on the information submitted and as presented during the meeting, **recommended** the proposal for grant of Standard ToR issued by the Ministry for conducting EIA/EMP study for Kopra Medium Irrigation Project (CCA: 9990 Ha) in an area of 1044.52 Ha at village Bamarakunj, Berkheri Kalan, Devpura, Kanmar, etc, Sub District Rehli, Garhakota, District Sagar, Madhya Pradesh by M/s Water Resources Division No One Sagar, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

[A] Environmental Management and Biodiversity Conservation

i. PP shall obtain NBWL Clearance in view of project submergence area falls in Nauradehi Wildlife Sanctuary and its Eco Sensitive Zone.

ii. Explore the possibilities for reducing the Forest land requirement.

iii. As the Dam site falls in the transition zone between the upland and plain land, the detailed aquatic biodiversity and their period of migration needs to studied.

iv. Prepare Wildlife conservation plan with mitigation measures for minimizing the human–animal conflict and be suitably incorporated in the wildlife conservation plan in consultation with reputed government expert institute and State Forest Department.

v. Cumulative Impact of project on carrying capacity and sustainability of river of catchment area / due to lifting of water from river.

vi. Prepare Environmental Cost Benefit Analysis in terms of ecological damage due to diversion of Forest land/ loss of biodiversity and its impacts on ecosystem, water availability, water uses for generation of hydro power in study area 10 km from periphery of Project components.

vii. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted and thermal stratification. Accordingly, Environment Management plan shall be prepared.

viii. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/EMP report.

ix. Source of construction material and its distance from the project site along with detailed transportation plan for construction material be elaborated in the EIA EMP report. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.

x. A detailed wildlife conservation plan for Schedule –I species, duly approved by the Chief Wildlife Warden, be submitted.

xi. In case any wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.

xii. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

[B] Socio-economic Study

i. Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local population.

ii. Declaration by the Project Proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

iii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.

iv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22-65/2017- IA.III dated 30th September, 2020 shall be submitted.

v. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.

vi. Details of settlement in 10 km area shall be submitted.

vii. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22-

65/2017- IA.III dated 30th September, 2020 shall be submitted.

[C] Muck Management:

i. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.

ii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/EMP report.

iii. Techno-economic viability of the project must be recommended from CEA/ CWC.

[D] Miscellaneous.

i. Pre-DPR Chapters viz. Hydrology, Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.

ii. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.

iii. Both capital and recurring expenditure under EMP shall be submitted.

iv. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.

v. Arial view video of project site shall be recorded and to be submitted.

vi. As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.

<u>Agenda Item No. 26.4</u>

Proposed Pachnad Major Irrigation Scheme (CCA : 24,328 Ha) in an area of 24328 Ha located at village Sadhrapur, Sub-District and District Auraiya, Uttar Pradesh by M/s Irrigation and Water Resource Department, Kanpur, Uttar Pradesh State – Terms of References (TOR) - reg.

26.4.1 The proposal is for grant of Terms of Reference (TOR) for conducting EIA study for proposed Panchnad Major Irrigation Scheme (CCA : 24,328 Ha) in an area of 24328 Ha located at village Sadhrapur, Sub-District and District Auraiya, Uttar Pradesh by M/s Irrigation and Water Resource Department, Kanpur, Uttar Pradesh.

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

i. The word 'Pachnad' got mentioned incorrectly in the application for TOR, the same may be read as 'Panchnad'. Panchnad Major Irrigation Scheme aims the stabilization of command area of Kuthond branch canal, which is part of Betwa canal system. The command area of the branch canal considered to be stabilized is assessed to be 24,328 Ha.

ii. The stored water behind the barrage will be used for irrigating the command area of Kuthond branch canal to the extent of 57,170 Ha consisting of 24,327 Ha, 22,382 Ha and 10,461 Ha during Kharif, Rabi and Zaid seasons respectively. With provision for supply drinking water and reservoir fisheries development at Near Sadrapur Village, Ajitmal Tehsil, Auraiya District, Uttar Pradesh State.

iii. It also aims to provide 50 MCM of water from the reservoir for meeting the future drinking water needs of the area and develop reservoir fisheries.

iv. The project consists of construction of a Barrage, Pump House on the right side of barrage and a pressure main to drop water into Kuthond branch canal. Further the construction of barrage is planned in between Prayagraj and Delhi inland waterway. To facilitate the easy movement of vessels in this route navigation locks along with other necessary structures are contemplated to be incorporated in the layout of the Barrage. Since the command area considered for stabilization is already developed with necessary canal network and land development, no command area development is planned under the project.

v. The geographical co-ordinate of the project are 79º 22' 9.30" E to 79º 22' 19.90" E and 26º 24' 48.60" N to 26º 24' 23.90" N

vi. **Land requirement:** Land requirement for the project is approx. about 3 ha. for pump house and pressure main, approx. about 15 ha. for head works. Hence total actual land requirement for the project is about 18 ha.

vii. **Water requirement:** The total quantity of water required during construction period for the construction activities and colonies is estimated 205878.725 KL. The source of water will be used from the Yamuna Basin.The water consumption during operation phase is estimated to be 5.0 KLD for about 6 employees along with their families and the same would be provided by the local authorities.

viii. **Project Cost:** The estimated project cost is **Rs. 3201.70 Crore.**

ix. **Environmental Sensitive area:** There is one wildlife sanctuary i.e., National Chambal Wildlife Sanctuary within 15 km radius from the project site. River Yamuna is flowing within the project site.

x. **Alternative Studies:**

Reconnaissance survey through boat was conducted during 8th to 10th September 2022 in a stretch of 40 km of river from the confluence of River Yamuna and Chambal to Auraiya Ghat. On the basis of straight reach, low river width and suitability of River banks following three alternate locations were identified as barrage sites.

- Alternative-I: 1 km upstream of Bijalpur village site;
- Alternative-II: Bijalpur Village site; and
- Alternative-III: Sadrapur village site

A joint visit by a team of experts from Geological Survey of India (GSI), Central Water Commission (CWC), and IWRD of Go UP was conducted during 28th and 29th October 2022. During the visit it was found that the banks of river at Alternative-I location are not stable. Height of both the banks are lower than the HFL value and width of river is more compared to other two alternatives Hence, Alternative-I location was dropped.

Another joint visit by Design experts from CWC, Faridabad and IWRD of GoUP was undertaken during between 9th and 11th November 2022. During this visit Sadrapur (26^0 24' 45.24" N and 79^0 22' 11.10" E) i.e. Alternate-III site was finalized as the best feasible site for construction of proposed Panchnad Irrigation Scheme. The deepest bed level of river at proposed barrage axis is about 99.67 m. The pond level of barrage at this site is about 109.00 m

A joint visit by Hydrology expert from CWC and IWRD of GoUP was carried out during 19th to 21st December 2022. During this visit feasibility of lifting point on right bank at just upstream of proposed barrage was also explored and it was found that suitable site is available for construction of Pump House in the right bank instead of about 20 km upstream of barrage.

xi. **Details of Solid waste/ Hazardous waste generation/ Muck and its management:**

The excavated muck/soil/spoil is about1.7 Lakh Cum will be tested for suitability for formation of approach road. The spoil (stone) will be used for the purpose of concrete and revetment to approach roads laid from nearest habitation to the project site.

xii. Status of Litigation Pending against the proposal, if any. – No

xiii. The salient features of the project are as under:-

1. Project Details:

Name of the Proposal	**Proposed Panchnad Major Irrigation Scheme**
Location (Including coordinates)	Near Sadrapur village, Ajitmal Tehsil, Auraiya district, U.P. within the Geo coordinates of 79º 22'

	9.30" E to 79º 22' 19.90" E and 26º 24' 48.60" N to 26º 24' 23.90" N in Yamuna basin
Inter- state issue involved	Yes
Seismic zone	Zone- III

2. Category Details:

Category of the project	Category - A
Provisions	Panchnad Irrigation Scheme (PIS)is mainly an irrigation project. The stored water behind the barrage will be used for irrigating the command area of Kuthond branch canal to the extent of 57,170 Ha consisting of 24,327 Ha, 22,382 Ha and 10,461 Ha during Kharif, Rabi and Zaid seasons respectively. With provision for supply drinking water and reservoir fisheries development
Capacity / Cultural command area (CCA)	24,328 Ha
Attracts the General Conditions (Yes/No)	Yes
Additional information (if any)	---

3. ToR/EC Details:

Cost of project	Rs. 3201.70 Crore
Total area of Project	Catchments area - 2,49,852 sq. km at Barrage site Submergence area - 72.18 Sqkm (within river course and No submergence in other state at pond level) Culturable Command Area - 24328 Ha Gross command Area - 44403 Ha Gross Irrigated area (GIA) - 57170 Ha
Height of Dam from River Bed (EL)	28 m
Length of Tunnel/Channel	764.2 m (Total water way)
Details of Submergence area	7218 ha is submergence area and belongs to the Government, as the total submergence area is within the river and area upto FTL on both banks of the river belongs to Government
Types of Waste and quantity of generation during construction/ Operation	The excavated muck/soil/spoil is about1.7 Lakh Cum will be tested for suitability for formation of approach road.
E-Flows for the Project	---

Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin. b) If not the E-Flows maintain criteria for sustaining river ecosystem.	No, (As per downstream requirement E-flow will be maintained.)

4. Muck Management Details:

No. of proposed disposal area/ (type of land Forest/Pvt. land)	No disposal is envisaged. The spoil (stone) will be used for the purpose of concrete and revetment to approach roads, guide bunds and afflux bunds laid from nearest habitation to the project site.
Muck Management Plan	The spoil (stone) will be used for the purpose of concrete and revetment to approach roads, guide bunds and afflux bunds laid from nearest habitation to the project site.
Monitoring mechanism for Muck Disposal	The spoil (stone) will be used for the purpose of concrete and revetment to approach roads, guide bunds and afflux bunds laid from nearest habitation to the project site.

5. Land Area Breakup:

Private land	18 ha.
Government land/Forest Land	Forest Land – 1900 ha (National Chambal Wildlife Sanctuary)
Submergence area/Reservoir area	Submergence area -7218 ha (Govt. Land)
Land required for project components	Land requirement for the project is approx. about 3 ha. for pump house and pressure main, approx. about 15 ha for head works. Hence total actual land requirement for the project is about 18 ha.
Additional information (if any)	---

6. Presence of Environmentally Sensitive areas in the study area

Forest Land/ Protected Area/ Environmental Sensitivity Zone	**Yes/ No**	**Details of Certificate/Letter/Remarks**
Reserve Forest/Protected Forest Land	No	
National Park	No	

Wildlife Sanctuary	Yes	About 1900 ha of National Chambal Wildlife Sanctuary is coming under submergence area for which application for NOC/ Permission from NBWL is already submitted to MoEF&CC.

7. Court case details:

Court Case	Nil
Additional information (if any)	---

8. Affidavit/Undertaking details:

Affidavit/Undertaking	Undertaking enclosed as Annexure-VI
Additional information (if any)	---

9. Miscellaneous

Particulars	**Letter no. and date**
Details of consultant	**Rightsource Industrial Solutions Pvt. Ltd., Hyderabad**
Project Benefits	The importance of irrigation is to increase agricultural output and employment. The proposed project is expected to provide employment in different activities such as construction, transportation and plantation activities during construction phase and subsequently in agriculture and agro and other industries. The total man power requirement for the construction period is 1000members. The area irrigated by the project is inhabited by Rural families and thus the project helps to improve the economic condition of Rural families in the command area of the project. The implementation of the project will improve the economic condition of about 50000 household members and majority of this population is dependent on agriculture.
Status of other statutory clearances	About 1900 ha of National Chambal Wildlife Sanctuary is coming under submergence area for which application for NOC/ Permission from NBWL is already submitted to MoEF&CC.
R&R details	Not applicable
Additional detail (If any)	---

26.4.3 Earlier, the proposal was considered by the EAC on 05.11.2024, wherein the EAC sought additional following information:

i. PP shall submit land use /land type pattern.
ii. In view of ecological sensitivity of the proposed project site the Sub-committee of EAC members shall conduct a site visit before making any recommendations to the project site.

In view of the one of the additional information sought by the EAC, a sub-committee of the EAC (RV&HEP) comprising following expert members conducted a site visit of the proposed project during 17.01.2025 to 19.01.2025:

i. Dr. J.A. Johnson, Expert Member & Senior Wildlife Scientist from WII, Dehradun
ii. Representative from Central Water Commission (CWC)
iii. Representative from MoEF&CC

The proposal was reconsidered by the EAC in its meeting held on 14.02.2025 wherein PP did not attend the meeting and deferred the proposal, However, the EAC deliberated on the observations of the sub-committee report and recommended the following:

a. The PP may undertake study to estimate the available sandbars, river islands, river sandbanks and river bed submergence area in Nation Chambal Sanctuary at different barrage height level/HFL viz. at 105 M, 107 M & 109 M; based on the modelling the PP may come with the barrage height, which cause less ecological impact to aquatic animals residing in National Chambal Sanctury for considering TOR. So that the appropriate barrage height with minimum disturbance to National Chambal Wildlife Sanctuary could be finalized.
b. Alternatively, the project proponent should explore the alternate barrage sites not less than 7 km downstream to the proposed barrage site so that backwater flow impacts on the National Chambal Wildlife Sanctuary, will be minimized.
c. Calculation of per day demand for lift irrigation from the Barrage and how much water depth will be available after lifting may be submitted. At the same time, it is also necessary to calculate how much time it will take naturally to reach the old level of water (before lifting) in the reservoir again.

It was opined by the EAC that PP shall submit additional details sought in EAC 18th meeting held on 05.11.2024 along with above mentioned information.

The PP vide communication dated 05.03.2025 submitted the additional information sought by the EAC. Point wise reply submitted by the PP as follows:

Query 1:The PP may undertake study to estimate the available sandbars, river islands, river sandbanks and river bed submergence area in Nation Chambal Sanctuary at different barrage height level/HFL viz. at 105 M, 107 M & 109 M; based on the modelling the PP may come with the barrage height, which cause less ecological impact to aquatic animals residing in National Chambal Sanctury for considering TOR. So that the

appropriate barrage height with minimum disturbance to National Chambal Wildlife Sanctuary could be finalized.

Reply: 26.6 sqkm area of sand bed is available at pond level of 109.00 m. It is not possible to reduce the pond level because on reducing the pond level barrage storage capacity will decrease and water requirement will not be fulfilled as taken in the project. As a result project will not be feasible.

Query 2:Alternatively, the project proponent should explore the alternate barrage sites not less than 7 km downstream to the proposed barrage site so that backwater flow impacts on the National Chambal Wildlife Sanctuary, will be minimized.

Reply: For the proposed barrage, reconnaissance survey was conducted by the team from CWC Planning Circle, Faridabad out of which Sadarapur was found suitable for construction of barrage as Both the river banks are firm and their top levels are above R.L. 120 m i.e. more than 100 year HFL, in that region .River is flowing in a straight reach; no meandering is seen. Present site the most appropriate location of Barrage Construction. So it in not possible to change the location of proposed barrage.

Query 3:Calculation of per day demand for lift irrigation from the Barrage and how much water depth will be available after lifting may be submitted. At the same time, it is also necessary to calculate how much time it will take naturally to reach the old level of water (before lifting) in the reservoir again.

Reply: For the lift irrigation purpose the discharge required is 650 cusec and. per day water requirement is 1.59 MCM. Water depth and discharge in the Yamuna river varies throughout the day so it is not possible to calculate the water depth and time it will take naturally to reach the old level of water (before lifting) in the reservoir again.

Query 4: PP shall submit land use /land type pattern.

Reply: Regarding the land use/land type pattern 3 Ha. land is used for pump house and pressure mains in addition to this 15 Ha. land is used for head works. So in total 18 Ha. land need to be acquired from the farmers/locals in Panchnad Irrigation Project. Beside this land, no other land will be required. There is a submergence area of 7218 Ha. which is confined within the banks of Yamuna River.

26.4.4 The EAC during deliberations noted the following:

The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting and observed that the proposal is for grant of TOR to the project for conducting EIA/EMP and Public hearing for Panchnad Major Irrigation Scheme (CCA : 24,328 Ha) in an area of 24328 Ha located at village Sadhrapur, Sub-District and District Auraiya, Uttar Pradesh by M/s Irrigation and Water Resource Department, Kanpur, Uttar Pradesh.

The EAC in its meeting held on 05.03.2025 observed the following:

- The EAC noted that the all irrigation projects falls under Category B as per EIA Notification 2006 as amended. The command area of the project is 24,328 Ha, however,

the project attracts the General Condition of EIA Notification 2006 as amended, as the proposed project cover area is falling within 10 km of inter-state Boundary and National Chambal Wildlife Sanctuary; hence, the project has to be appraised at Central Level as Category "A" project of item 1 (c) 'River Valley projects' of the Schedule to the EIA Notification, 2006.

- The EAC raised concerned about the total land area is approx. about 3 ha. for pump house and pressure main, approx. about 15 ha for head works. So, total actual land requirement for the project is about 18 ha; whereas submergence area of 7218 ha is a government land and about 1900 ha of National Chambal Gharial Wildlife Sanctuary is coming under submergence area. The Sanctuary houses various endangered wildlife species specially Ghariyals. PP informed that an application for NOC/ Permission from NBWL is already submitted to MoEF&CC.
- The EAC further noted that the inter-state boundaries of Uttar Pradesh - Madhya Pradesh - Rajasthan States are falling within the submergence area in Chambal River.

The EAC in the current meeting observed the following:

- Additional information submitted by the PP deliberated in detail in the present meeting and EAC raised concern over 1900 ha of National Chambal Wildlife Sanctuary is coming under submergence area which is a tri-state protected area is renowned for its diverse wildlife, including the critically endangered gharial, red-crowned roof turtle, and the endangered Ganges river dolphin.
- The EAC was of the view that if in case the pond level rises upto 109.00 m, then there would submergence of sandbars, river islands, river sandbanks and river bed which are the habitat and breeding nest of wildlife species. Therefore, PP shall carry out specific detailed study on effect of submergence area on endangered species in consultation with reputed government institution and prepare mitigation plan for the same.

26.4.5 The EAC based on the information submitted and as presented during the meeting, recommended the proposal for grant of Standard ToR issued by the Ministry for conducting EIA/EMP study for Panchnad Major Irrigation Scheme (CCA : 24,328 Ha) in an area of 24328 Ha located at village Sadhrapur, Sub-District and District Auraiya, Uttar Pradesh by M/s Irrigation and Water Resource Department, Kanpur, Uttar Pradesh, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR.

[A] Environmental Management and Biodiversity Conservation

i. PP shall obtain NBWL Clearance in view of project cover area is falling within 10 km of inter-state Boundary and National Chambal Wildlife Sanctuary.

ii. Impact of submergence due to construction of barrage on habitat of Gharial be studied through expert government institution.

iii. Explore the possibilities for reducing the Forest land requirement.

iv. Prepare Wildlife conservation plan with mitigation measures for minimizing the human–animal conflict and be suitably incorporated in the wildlife conservation plan in consultation with reputed government expert institute and State Forest Department.

v. Prepare Environmental Cost Benefit Analysis in terms of ecological damage due to diversion of Forest land/ loss of biodiversity and its impacts on ecosystem, water availability, water uses for generation of hydro power in study area 10 km from periphery of Project components.

vi. A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted and thermal stratification. Accordingly, Environment Management plan shall be prepared.

vii. Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/EMP report.

viii. Source of construction material and its distance from the project site along with detailed transportation plan for construction material be elaborated in the EIA EMP report. A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.

ix. A detailed wildlife conservation plan for Schedule –I species, duly approved by the Chief Wildlife Warden, be submitted.

x. In case any wildlife corridor is located within 10 km radius of the project site a detailed study shall be conducted to assess the impact of project on safe movement of wild animals.

xi. Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

[B] Socio-economic Study

i. Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local population.

ii. Declaration by the Project Proponent by way of affidavit that "No" Inter-state issue/

policy issue is involved with any State in the project.

iii. All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.

iv. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22-65/2017- IA.III dated 30th September, 2020 shall be submitted.

v. Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.

vi. Details of settlement in 10 km area shall be submitted.

vii. Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F. No. 22-65/2017- IA.III dated 30th September, 2020 shall be submitted.

[C] Muck Management:

i. Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.

ii. Details of Muck Management plan prepared along with estimated cost incorporated in EIA/EMP report.

iii. Techno-economic viability of the project must be recommended from CEA/ CWC.

[D] Miscellaneous.

i. Pre-DPR Chapters viz. Hydrology, Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.

ii. Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.

iii. Both capital and recurring expenditure under EMP shall be submitted.

iv. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.

v. Arial view video of project site shall be recorded and to be submitted.

vi. As per Ministry's OM dated 1st August, 2013, PP shall submit application to obtain prior approval of Central Government under the Forest Conservation Act, 1980 for diversion of forest land required for such projects will be submitted as soon as the actual extent of forest land required for the project is known to the project proponent, and in any case, within 6 months of issuance of ToR. However, no proposal will be put up before EAC without submission of application for forest clearance, wherever applicable.

The meeting concluded with thanks to the Chair.

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ANNEXURE

ATTENDANCE

S. No.	Name of Member	Role
1.	Prof. Govind Chakrapani	Chairman
2.	Dr. Uday Kumar R Y	Member
3.	Shri Kartik Sapre	Member
4.	Shri Ajay Kumar Lal	Member
5.	Shri Rajeev Varshney	Member Representative of Central Electricity Authority (CEA)
6.	Shri Balram Kumar	Member Representative of Central Water Commission (CWC)
7.	Shri Yogendra Pal Singh	Member Secretary

Approval of the Chairman

Re: Draft MOM of the 26th EAC (RVHEP) meeting held on 14.03.2025-reg.

CG Chakrapani GovindaJoseph <govind.chakrapani@es.iitr.ac.in>
Mon, 24 Mar 2025 9:44:46 AM +0530

To "Yogendra Pal Singh" <yogendra78@nic.in>

Cc "chakrapani govind" <chakrapani.govind@gmail.com>

Approved.
Chakrapani

On 24-Mar-2025 09:10, Yogendra Pal Singh <yogendra78@nic.in> wrote:

Dear Sir,

The Draft MOM of the 26th EAC (RVHEP) meeting held on 14.03.2025 is attached herewith approval please.
With Regards,

Yogendra Pal Singh
Scientist 'F'
Government of India
M/o Environment, Forest and Climate Change
Room No. 236, 2nd Floor, Vayu Wing
Indira Paryavaran Bhawan
Jor Bagh, New Delhi-110003
Tele-fax: 011-20819364