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

**Minutes of AGENDA OF 10TH MEETING OF THE EXPERT APPRAISAL COM MITTEE meeting River Valley and Hydroelectric Projects held from 29/04/2024 to 29/04/2024** **Date:** 09/05/2024

**MoM ID:** EC/MOM/EAC/408274/4/2024

**Agenda ID:** EC/AGENDA/EAC/408274/4/2024

**Meeting Venue:** N/A

**Meeting Mode:** Virtual

**Date & Time:**

| | | |
|---|---|---|
| 29/04/2024 | 10:30 AM | 02:30 PM |

**1. Opening remarks**

The 10th meeting of the EAC for River Valley & Hydroelectric Projects, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 29th April, 2024 through virtual (online) mode, under the Chairmanship of Prof. G. J. Chakrapani.

**2. Confirmation of the minutes of previous meeting**

Confirmation of Minutes of the Meeting held on 9th EAC meeting on 20th March, 2024

**3. Details of proposals considered by the committee**

**Day 1 -29/04/2024**

**3.1. Agenda Item No 1:**

**3.1.1. Details of the proposal**

| | | | |
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| **Chichlik Pumped Storage Hydro Project (1560 MW)** by **AVAADA WATERBATTERY PRIVATE LIMITED** loc ated at **SONBHADRA,UTTAR PRADESH** | | | |
| **Proposal For** | | Fresh ToR | |
| **Proposal No** | **File No** | **Submission Date** | **Activity (Schedule Item)** |
| IA/UP/RIV/459501/2024 | J-12011/08/2024-IA-I(R) | 29/02/2024 | River Valley/Irrigation projects (1( c)) |

**3.1.2. Project Salient Features**

The proposal is for grant of Terms of References (ToR) to the project for Chichlik Pumped Storage Hydro Project (1560 MW) in an area of 317.6 Ha located at Village Argarh, Chichli, Khuraila and Pokharriya, Sub District Robertsganj, District Sonbhadra (Uttar Pradesh) by M/s Avaada Waterbattery Private Limited.

**10.1.2** The Project Proponent and the accredited Consultant M/s R S Envirolink Technologies Pvt. Ltd. submitted the following information:

i. The Chichlik Off-Stream Closed Loop Pumped Storage project (OCPSP) is proposed between two reservoirs i.e., Chichlik Upper & Lower Reservoirs (both to be constructed newly) and onetime water will be pumped from Sone River to fill up the lower reservoir.

ii. The project area is located to the south of Chichlik and west of Bashuhari villages, falling in Robertsganj tehsil of Sonbhadra district situated in south-east part of the Uttar Pradesh.

iii. Based on the Initial assessment of the project site and alternative study, a Pre-feasibility report was prepared and subsequently further alternative studies were carried out for aligning the layout towards downstream in order to reduce the forest land as advised by EAC during the meeting held on 20th March 2024 for consideration of TOR. Accordingly, as per the revised layout with reduced forest lands related to the Upper Reservoir & Lower Reservoir to be created by construction of 28.00 meter & 24.20-meter-high CFRD dam having gross storage capacities 13.59 MCM & 10.75 MCM respectively.

iv. Water Conductor System with steel Penstock of 3.5 diameter, Surface Powerhouse Complex to house 7 generating units & Tail Race Tunnel. One-time water will be pumped from the Sone River by laying 0.5 km long pipeline to fill up the lower reservoir.

v. The proposed Chichlik PSP (5 x 260 MW + 2x 130 MW) envisages following major civil structures:

- Concrete faced rockfill dam of 1460.20m long & 28.00m high forming the upper reservoir.
- Concrete faced rockfill dam of 2196. 76m long & 24.20m high forming the lower reservoir.
- An average of 240.00m long & 148.00m wide concrete lined approach channel at the upstream of upper intake.
- Six nos. of 60.55m long Diffuser type upper Intake structure with vertical trash rack.
- Concrete gate shaft housing the stoplog/service gates.
- Five nos. of 4.50m dia. Main pressure shaft to feed 5 units of 260MW with One no. of 4.50m dia. Main pressure shaft bifurcate into two nos. of 3.50m dia. Unit Pressure shaft to feed 2 units of 130MW. The maximum length of water conductor system was found to be 1644. 70m with 371.50m long Vertical pressure shaft & 90.75m long unit pressure shaft.
- One no. of 6.50 m (W) x 7 .50 m (D), D -- shaped construction adit of about 570.00 m length for the construction of pressure shaft.
- A pit type surface powerhouse housing 5 Nos. of reversible (fixed speed) units of 260 MW each & 2 Nos. of reversible (fixed speed) units of 130 MW capacity each.
- A transformer I GIS building of size 213.70 m (L) x 16.00 m (W) x 20.00 m (H) & switchyard of 35.15 m width, parallel to the length of powerhouse at the downstream side.
- One no. of 8.50m Dia. D -- shaped MAT/Escape tunnel of about 855.00 m length for the access of Powerhouse.
- Five nos. of 5.00 m dia. & 2 Nos. of 3.50m dia. concrete lined tail race tunnel of 163.30 m length each.
- Seven nos. of 61.55m long diffuser type Lower Intake structure with vertical trash rack.
- An average of 280.00 m long & 168.65 m wide concrete lined approach channel at the downstream of lower intake structure.

vi. The total land required for the construction of various components and related works for Chichlik PSP is estimated to be around 317.6 ha, out of which 106.78 ha is non-forest land and 210.82 ha is forest land. Diversion of forest land for non-forest purpose will be involved for construction of Chichlik project components. Therefore, Forest Clearance is required to be obtained under Forest Conservation Act. The proposed project is located around 3.92 km away from boundary of Kaimur WLS boundary. Any impacts on biodiversity due to development of proposed PSP shall be studied as part of EIA studies.

vii. The estimated project cost is Rs. 7380.90 Crore including IDC. As a preliminary estimate, a construction period of 36 months from the date of award of civil works package has been estimated for this project.

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

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| Name of the Proposal | Chichlik Pumped Storage Project |
| Location<br>(Including coordinates) | Lower Reservoir: 83°27'13.34"E; 24°31'37.74"N<br>Upper Reservoir: 83°26'17.09" E; 24°32'27.95"N |
| Inter- state issue involved | No |
| Seismic zone | Zone-III |

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| Category of the project | A |
| Provisions | |
| Capacity / Cultural command area (CCA) | 1560 MW |
| Attracts the General Conditions (Yes/No) | Yes |
| Additional information (if any) | Nil |

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|---|---|
| Powerhouse Installed Capacity | 1560 MW |
| Generation of Electricity Annually | 3539.4 MU |
| No. of Units | 7 nos. (5X260 MW+2X130 MW) |
| Additional information (if any) | Nil |

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|---|---|
| Cost of project | 7380.90 Cr. |
| Total area of Project | 317.6 Ha |
| Height of Dam from River Bed (EL) | Lower Dam – 28.0 m<br>Upper Dam – 24.20 m |
| Length of Tunnel/Channel | 1014.0 m |
| Details of Submergence area | 176.60 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 Off-Stream Closed L oop Pumped Storage Project (PSP) |
| Is Projects earlier studies in Cumulative Impact a | No |

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| ssessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then<br>a) E-flow with TOR /Recommendation by<br>b) EAC as per CIA&CC study of River Basin.<br>If not the E-Flows maintain criteria for sustaining river ecosystem. | |

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| No. of proposed disposal area/ (type of land-Forest/Pvt. land) | 80.0 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 |

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| Private Land | 106.78 Ha |
| Government land/Forest Land | 210.82 Ha |
| Submergence area/Reservoir area | 176.60 Ha |
| Land required for project components | 141.00 Ha |
| Additional information (if any) | Nil |

| **Forest Land/ Protected Area/ Environmental Sensitivity Zone** | **Detail of Certificate / letter/ Remarks** |
|---|---|
| Reserve Forest/Protected Forest Land | Distance from nearest protected area (Kaimur WLS; Bihar) is 3.92 Km, however, proposed project is outside the notified ESZ boundary of the sanctuary. |
| National Park | |
| Wildlife Sanctuary | |

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

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| Affidavit/Undertaking | Enclosed |
| Additional information (if any) | Nil |

| **Particulars** | **Details** |
|---|---|
| Details of consultant | M/s. R S Envirolink Technologies Pvt. Ltd. (RSET) (NABET Accredited Consultant Organization)<br>Certificate No: NABET/EIA/2225/RA0274<br>Validity: August 15, 2025<br>Name of Sector : River Valley and Hydroelectric Projects<br>Category : A |

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|---|---|
| | MoEF Schedule : I(C)<br>Address : 403, Bestech Chambers,<br>Block-B, Sushant Lok Phase I, Sector 43, Gurugram, Har yana - 122009 |
| Project Benefits | Pumped storage hydropower is a modified use of conven tional hydropower technology to store and manage ener gy or electricity by moving water between an upper and lower reservoir. Currently, pumped storage round-trip or cycle energy efficiencies exceed 80%, supporting favora bly to other energy storage technologies and thermal tec hnologies. This effectively shifts, stores, and reuses ener gy generated until there is corresponding demand for sys tem reserves and variable energy integration. This shifti ng can also occur to avoid transmission congestion perio ds, to help more efficiently manage transmission grid, an d to avoid potential interruptions to energy supply. This is important because many of the renewable energy reso urces being developed (e.g., wind and solar) are generate d at times of low demand and off-peak energy demand p eriods are still being met with fossil fuel resources, often at inefficient performance levels that increase the release of greenhouse gas emissions.<br>Further, pumped storage projects are critical to the natio nal economy and overall energy reliability because it is:<br>o Least expensive source of electricity, not requiring fo ssil fuel for generation<br>o An emission-free renewable source<br>o Balancing grid for demand driven variations<br>o Balancing generation driven variations<br>o Voltage support and grid stability<br>Apart from this, proposed PSP will also benefit the local community by creating employment opportunities and wil l result in upliftment of livelihood and socio-economic co nditions. |
| Status of other statut ory clearances | Forest Clearance - Online application seeking forest diver sion for around 210.82 Ha after receipt of ToR Approval, alongwith 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 |

**10.1.3** The EAC during deliberations noted the following:

| Sr. No. | Observation | Reply of PP |
|---|---|---|
| 1 | PP shall further analyse the alte rnative site downstream of the | Alternative study has been carried out in detail considering moving further downstream and with a view to reduce the f |

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| | river wherein forest area can be reduced or with revised layout with minimum forest area even with slight change in power ca pacity. | orest area. Three additional alternatives were considered an d Alternative 2 was finalized.<br>The forest area in the most optimum proposal (Alternative 2) has been reduced by 23.28 Ha from 184.3 Ha (Lower 10 2.75 Ha+ Upper 81.55 Ha) to 161.02 Ha (Lower 70.95 Ha+ Upper 90.07 Ha) towards surface components and overall re duction in forest area works out to be 10 Ha including unde rground components. Detailed alternative analysis has been submitted and presented before the EAC |
| 2 | PP shall submit MoU signed w ith the State concerned departm ent for setting up the proposed project of 1560 MW capacity a nd availability of water for the project. | Updated MoU for 1560 MW installed capacity has b een signed between Government of Uttar Pradesh an d M/s. Avaada Waterbattery Private Limited vide let ter dated 27.09.2023 |
| 3 | Secondary data of presence/occ urrence of wildlife in consultati on in forest department and loc al people shall be provided. Fur ther, Categorization of the fore st land and Land use land cover of the study area based on FSI data shall be provided | The project location falls within the jurisdiction of th e Sonbhadra Forest Division, Uttar Pradesh (implant ing years 201415 to 2023-24). Information regarding the faunal diversity comprising mammals, birds and herpetofauna, is acquired through the discussion wit h forest officials and referring the working plan of th e Sonbhadra Forest Division. The details of various f aunal species are given as under:<br>**Secondary Data of Presence/Occurrence of Wildlif e in Consultation in Forest Department**<br><br>**Faunal Diversity in the Study Area**<br><br>The project location falls within the jurisdiction of the Sonbhadra Forest Division, Uttar Pradesh (im planting years 2014-15 to 2023-24). Information r egarding the faunal diversity comprising mammal s, birds and herpetofauna, is acquired through the discussion with forest officials and referring the w orking plan of the Sonbhadra Forest Division. The details of various faunal species are given as follo ws:<br><br>***Mammals reported in the Study Area***<br><br>The study site comprises of the carnivore species l ike Common Leopard (*Panthera pardus*), Jackal ( *Canis aureus*), Wild Dog (*Cuon alpinus*), Sloth B ear (*Melursus ursinus*), Indian Fox (*Vulpes bengal ensis*), Striped Hyaena (*Hyaena hyaena*), etc. The antelopes are represented by Nilgai (*Boselaphus tr agocamelus*), Four-horned Antelope (*Tetracerus q uadricornis*), Blackbuck (*Antilope cervicapra*), et c. and Spotted deer (*Axis axis*) and Sambar deer ( *Rusa unicolor*) are few deer species reported in th e area. Indian Wild Boar (*Sus scrofa*) is also com monly found in the area.<br><br>Other mammalian species commonly found in the |

area include primates such as Rhesus Monkey (*M acaca mulatta*) and Northern-plain Gray Langur ( *Semnopithecus entellus*) and rodents such as India n Crested Porcupine (*Hystrix indica*), Five-striped Palm Squirrel (*Funambulus pennantii*), Rats & M ouses, etc.

***Avifauna reported in the Study Area***

The project area is dominated by the bird species s uch as Red-vented bulbul (*Pycnonotus cafer*), Bro wn Rock-chat (*Cercomela fusca*), Asian green be e-eater (*Merops orientalis*), Black Drongo (*Dicrur us macrocercus*), Indian Robin (*Saxicoloides fulic atus*), Black-winged kite (*Elanus caeruleus*), Hou se Sparrow (*Passer domesticus*), Jungle babbler ( *Turdoides striata*), Spotted dove (*Spilopelia chine nsis*), Laughing dove (*Spilopelia senegalensis*),In dian Rofous Tree pie (*Dendrocitta vagabunda*), G reater coucal (*Centropus sinensis*), Tree Pipit (*Ant hus trivialis*), etc.

The species such as Ruddy shelduck (*Tadorna fer ruginea*), Great Egret (*Ardea alba*), Cattle egret ( *Bubulcus ibis*), Little Egret (*Egretta garzetta*) Red wattled Lapwing (*Vanellus indicus*), Common san dpiper (*Actitis hypoleucos*), Lesser whistling duck (*Dendrocygna javanica*), etc. are commonly repor ted near the water bodies.

***Herpetofauna reported in the Study Area***

The most common species reported in the project area are The Bengal Monitor (*Varanus bengalensi s*), Indian Chameleon (*Chamaeleo zeylanicus*), In dian Rat Snake (*Ptyas mucosa*), Common Krait (*B ungarus caeruleus*), Indian Cobra (*Naja naja*), Rus sel's Viper (*Daboia russelii*), Saw-scaled Viper (*E chis carinatus*), Indian Sand Boa (*Eryx johnii*), In dian Star Tortoise (*Geochelone elegans*), etc.

For the preparation of the land use/ land cover map of the study area of Chichlik PSP, digital data, The I ndian Forest Survey Report (ISFR) data of 2021 has been procured from Forest Survey of India, Dehrad un. As per the data, moderately Dense forests cover 16.57%, Open forests constitute 35.81% and Scrubs constitute 1.37% of the total study area. Rest 43.8 0% is the non-forest area.

| Forest Cover | Area (%) | Canopy density |
|---|---|---|
| Moderately De nse Forest | 16.57 | Between 40% and 7 0% |
| Open Forest | 35.81 | Between 10% and 4 0% |
| Scrubs | 1.37% | Less than 10% |

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| 4 | CEA letter confirming project l ayout is not conflicting with an y other planned project in the p roposed area. | CEA letter no. CEA-HY-12-23/1/2024-HPA Division, confi rmed that the project layout is not conflicting with any othe r planned project and following is informed: |

- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.
- The EAC noted that PP has exercised three more alternatives, in which 2nd alternative has been selected for installation of the said project in which overall land has been reduced from 325.30 ha to 317.60 ha including reduction of forest land from 220.75 Ha to 210.82 Ha. It was informed that proposed lower reservoir in the selected site will be located at 13 m away from HFL of the Sone river.
- The committee's concern about the safety of the proposed lower reservoir, located just 13 meters away from the High Flood Level (HFL) of the Sone River, highlights the need for careful consideration of flood risks. Given the proximity to potential high water levels, there is a justified worry about the structural integrity and operational safety of the reservoir during flood events. The committee suggested that proper mitigation measures should be implemented. These could include reinforcing the reservoir's structure, enhancing drainage systems, and possibly installing flood barriers or diversion systems to manage overflow and protect the reservoir's integrity during high water events. Such precautions are essential to ensure the long-term safety and functionality of the reservoir.
- The proposed site is at 3.92 Km of ESZ boundary from project site, notified vide MOEF&CC notification dated 23rd Sep., 2016 as informed by project proponent and does not fall under Eco Sensitive Zone of Kaimoor Wildlife Sanctuary. The committee suggested to submit the Certificate and certified map from Chief Wildlife Warden that the project area is outside the ESZ boundary.
- It was noted that the head could not be increased by utilizing deeper underground reservoirs for a project based on the longitudinal section (L section) and the specific geography of the site. The explanation highlighted the geological and environmental constraints that limit the depth at which the reservoirs can be feasibly constructed. The PP conveyed that the project design and its capacity have been optimized to maximize efficiency and sustainability within these constraints. Essentially, the dialogue between the EAC and PP focuses on requirement of less forest land, balancing the technical feasibility and environmental impact, ensuring the project is both practical and environmentally sustainable.

**3.1.3. Deliberations by the committee in previous meetings**

**Date of EAC 1 :**20/03/2024

**Deliberations of EAC 1 :**

**9.3.3** 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 Terms of Reference (ToR) for conducting EIA study of the project for setting up of Chichlik Pumped Storage Hydro Project (1560 MW) in an area of 325.3 Ha located at Village Argarh, Chichli, Khuraila and Pokharriya, Sub District Robertsganj, District Sonbhadra (Uttar Pradesh) by M/s Avaada Waterbattery Private Limited.
- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.
- Both of the reservoirs are located away from river/stream/nallah, therefore the project is titled as closed loop pumped Storage. Onetime water will be pumped from Sone River to fill up the lower reservoir. There are two protected areas in vicinity of the project. Closest distance of project site from Kaimur Wildlife Sanctuary from Bihar side and Kaimur Wildlife Sanctuary towards Uttar Pradesh is about 3.92 km and 31.20km.
- MoU with Invest UP for development of Chichlik PSP has been signed for 1120 MW installed capacity on 27-09-2023. However, the proposal submitted with installed capacity to 1560 MW.

**9.3.3** The EAC after detailed deliberations observed that the proposal is for grant of ToR to greenfield project of Pump Storage. It was observed that muck disposal site is proposed on both side of the National Highway, for which necessary permission and safety measures is required to be taken. Further, upon reviewing drone footage of the project site and project details, the EAC observed that the total forest land required for the project is 220.75 ha and seems to be in densely populated forest area characterized by a high canopy of dry deciduous trees. Additionally, the EAC expressed apprehension about the cumulative effect of multiple projects already proposed within the region on the same river. Further, PP shall submit the corrected/revised MoU with capacity from State Government as proposed during ToR.

Based on detailed submissions of PP and observations of EAC, it was opined that further details regarding the project is required on following points:

all further analyse the alternative site downstream of the river wherein forest area can be reduced or with revised layout with minimum forest area even with slight change in power capacity.

ıall submit MoU signed with the State concerned department for setting up the proposed project of 1560 MW capacity and availability of water for the project.

ɔndary data of presence/occurrence of wildlife in consultation in forest department and local people shall be provided. Further, Categorisation of the forest land and Land use land cover of the study area based on FSI data shall be provided

، letter confirming project layout is not conflicting with any other planned project in the proposed area.

The project was ***deferred*** till submission of the above documents/issues.

**3.1.4. Deliberations by the EAC in current meetings**

The EAC after deliberations observed that instant project is for grant of grant of Terms of Reference for greenfield Pump Storage Project wherein water is proposed to be extracted from Sone River. The reservoir shall be filled in 2 years for generating envisaged capacity with excess monsoon water only. The Sone river is inter-state, for which Project Proponent is required to obtain 'No Objection Certificate' from the State of Jharkhand and Bihar as there may be genuine concern of downstream consumers. The availability of water in the river shall be submitted by Project Proponent from Central Water Commission and State Water Resources Department.

Further, alternatives sites in the same location proposed by PP, were deliberated in detail by EAC and found that there is no option to avoid forest land coming in the project area and in terms of head/elevation required for the project. However, it was desired that Forest Division of the Ministry and State Government while appraising Forest Clearance, shall take into account the richness of biodiversity and pristine forest area to take appropriate decision.

With regard to layout of the project and submission of clarification by Central Electricity Authority, it was observed that no other project is overlapping with the instant project. The proposed distance of lower reservoir 13 or 15 mtrs from HFL, it was desired that PP shall submit the proposal of EAC and seek approval of CEA/CWC for DPR, within a distance of 100 mts from HFL. The data and distance of HFL shall be certified by concerned State Government and shall be submitting grant submitting the proposal of grant of EC.

Based on the information submitted and as presented during the meeting, EAC **recommended** the proposal for grant of Standard ToR for conducting EIA study with Public consultation (Public Hearing + written submission ) to the project for Chichlik Pumped Storage Hydro Project (1560 MW) in an area of 317.6 Ha located at Village Argarh, Chichli, Khuraila and Pokharriya, Sub District Robertsganj, District Sonbhadra (Uttar Pradesh) by M/s Avaada Waterbattery Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR, in addition to the concerns raised in the deliberations

**3.1.5. Recommendation of EAC**

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| Recommended |

**3.1.6. Details of Terms of Reference**

**3.1.6.1. Specific**

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| **(A) Environmental Management and Biodiversity Conservation** | |
| 1. | Forest Division of the Ministry and State Government while appraising Forest Clearance, shall take into account the richness of biodiversity and pristine forest area to take appropriate decision. |
| 2. | Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 210.82 Ha of forest land involved in the project shall be submitted. |
| 3. | Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located around 3.92 km from outside the Eco- Sensitive Zone (ESZ) of Kaimoor Wildlife Sanctuary and also project site not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site. |
| 4. | PP shall submit the detail plan for filling the reservoir in 2 years for generating envisaged capacity with excess monsoon water only. |
| 5. | No Objection Certificate from State of Jharkhand and Bihar as there may be genuine concern of downstream consumers to avoid scarcity of water to consumers. The availability of water in the river shall be submitted by Project Proponent from Central Water Commission and State Water Resources Department |
| 6. | No transportation of raw materials shall be done through/within the Wildlife Sanctuary prior to the grant of State Government/ Forest Department/Wildlife Department. Accordingly, transportation plan shall be submitted by PP. |
| 7. | 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 |

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| | hydro power and Ecological flows. |
| 8. | |
| 9. | 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. |
| 10. | 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. |
| 11. | Conducting site specific ecological study with respect to riverine ecology focus on 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 Sone River shall be studied. |
| 12. | Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ Sone River /nala of catchment area / due to tapping of water for filling reservoir. |
| 13. | Action plan for survival or diversion of the rivulets/stream leading to join Sone river shall be submitted. |
| 14. | Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard 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. |
| 15. | 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. |
| 16. | Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP. |
| 17. | Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR)and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report. |
| 18. | The project area should not come up on any critical mineral zone to be verified by GSI/NMDC. |
| 19. | Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI. No mineral zone on the proposed site be certified by Geological Survey of India or any other concerned Government Organization. |
| **(B) Socio-economic Study** | |
| 1. | |
| 2. | |

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| 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 shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013. |
| 5. | Budget earmarked for R&R, CSR shall not include in the cost of EMP and compliance of issues raised during Public Hearing. |
| **(C) 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 site along with types of road etc. |
| 3. | 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. |
| 4. | Restoration plan for construction area including dumping site of excavated materials by levelling, filling up of burrow pits, landscaping etc. |
| **(D) 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. | PP shall submit the proposal of EAC and seek approval of CEA/CWC for DPR, with a distance of 100 mts from HFL to avoid future damage due to flood. The data and distance of HFL shall be certified by concerned State Government and shall be submitting grant submitting the proposal of grant of EC. |
| **(E) Miscellaneous** | |
| 1. | Both capital and recurring expenditure under EMP shall be submitted. |
| 2. | Pre-DPR Chapters viz., Hydrology, 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 submit. |
| 5. | 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. |
| 6. | Detailed plan to restore wider roads and convert them into narrow upto 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 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. |
| 9. | Detailed report on cumulative effect of multiple projects already proposed within the region on the same river. |

**3.2. Agenda Item No 2:**

**3.2.1. Details of the proposal**

| **Shirawta Off Stream Open Loop Pumped Storage Project (1800 MW)** by **The Tata Power Co. Ltd.** located at **PUNE,MAHARASHTRA** | | | |
|---|---|---|---|
| **Proposal For** | | Amendment in ToR | |
| **Proposal No** | **File No** | **Submission Date** | **Activity (Schedule Item)** |
| IA/MH/RIV/462841/2024 | J-12011/38/2023-IA.I (R) | 03/04/2024 | River Valley/Irrigation projects (1( c)) |

**3.2.2. Project Salient Features**

The proposal is for amendment in Terms of References (ToR) to the project for Shirawta Off Stream Open Loop Pumped Storage Project (1800 MW) in an area of 197.9 ha (change in land use with increase in forest area from 60.10 ha to 160.783 ha) at Village Khandshi, Tehsil Maval, District Pune, Maharashtra by M/s The Tata Power Company Limited.

**10.2.2** 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:

- The proposed Shirawta Pumped Storage Project (Shirawta PSP) is an Open Loop PSP scheme with an installed capacity of 1800 MW (5 x 300 MW + 2 x 150 MW) with existing lower Shirawta reservoir located at village Khandshi, Tal Maval, Dist. Pune which is owned and operated by Tata Power and new proposed upper reservoir situated in same village in land owned by Tata Power Co Ltd.
- The project area is in the Sahyadri ranges of the Western Ghats of Maharashtra State in the area bordering Pune and Raigad districts. Shirawta PSP has been designed to meet the peaking requirement daily in the southern region grid and the state of Maharashtra for a duration of about six (6) hours.

- It is proposed to utilize the head available between existing Shirawta lower dam and upper dam proposed in forest land. Lower Shirawta reservoir located at village Khandshi, Tal Maval, Dist. Pune of Maharashtra state having a geographical latitude 18°48'24.47"N and longitude 73°28'46.62"E. The upper dam is proposed to be located on forest land up-the-hill table plot having a geographical latitude 18°50'22.15"N and longitude 73°27'5.12"E.

**10.2.3** The EAC during deliberations noted the following:

- PP submitted an application for amendment in ToR granted by the Ministry vide letter dated 23.09.2023 to said project.
- For diversion of forest land, online application was submitted to MoEF&CC vide proposal No.: FP/MH/HYD/IRRIG/453299/2023 dated 27.11.2023. The Project envisages utilization of about 197.81 Ha for various project component including inter alia upper reservoir, lower reservoir, penstocks, powerhouse, approach road, dump yard etc. Of 197.81 Ha, 137.71 Ha was earlier proposed to be private land and 60.10 Ha was 'reserve forest' land. Therefore, Tata Power had submitted an application through Parivesh portal for diversion of 60.10 Ha of land for the proposed Project.
- PSC I was held on 11.12.2023 wherein DCF Pune office raised a query towards the nature of the land in erstwhile village Torne (roughly admeasuring about 101 Ha) and submitted that as per the forest records, the status is 'reserved forest'. Proposal was in principally accepted with a condition that DCF Pune shall verify the area statement of proposed project.
- The 'Title' and 'Legal Ownership' of the land (as per the prevailing revenue records for past 100 years till date) shows Tata Power's name. Reference directions by PSC-1, area statement and other details were verified by DCF Office and it was instructed to Tata Power to include this land parcel as well, in the application. Therefore, the total forest land gets revised from 60.10 Ha to 160.783 Ha and the non-forest land gets revised from 137.80 Ha to 37.014 Ha.
- No project component falls in any notified protected area. Nearest Protected Area to the Project Components is Bhimashankar Wildlife Sanctuary and Sudhagad Wildlife Sanctuary. Also, all the project components are well outside the notified EcoSensitive Zone (ESZ) of Bhimashankar Wildlife Sanctuary and Sudhagad Wildlife Sanctuary.
- Amendment sought by the PP is as follows:

| **Description** | **Reference** | **Existing** | **Proposed / Amendment** | **Reason** |
|---|---|---|---|---|
| Approved ToR | Subject | Shirawta Off Stream Open Loop Pumped Storage Project (1800 MW) in an area of 197.9 ha | Shirawta Off Stream Open Loop Pumped Storage Project (1800 MW) in an area of 197.9 ha (change in land use with increase in forest area from 60.10 ha to 160.783 ha) | |
| Land Requirement | Para 1 and Para 7 | 197.9 ha | 197.797 ha | The land has been optimized during detailed project design. |
| Land Requirement | Annexure 3 Para (i) | 197.9 ha | 197.797 ha | The land has been optimized during detailed |

| | | | | |
|---|---|---|---|---|
| | | | | project design. |
| Project/Activity Cost | Annexure 3 Para (iii) | Rs 7027.72 crore | Rs 7285.0 crore | The revision in the project cost is towards the changes in the technical specifications and towards revision in area of forest land and non-forest land. |
| Land Requirement | Annexure 3 Para (v) | Out of 197.9 ha of total land requirement, 60.1 ha is forest land and 137.8 ha is non-forest land of which 135.6 ha belongs to Tata Power. | Out of 197.797 ha of total land requirement, 160.783 ha is forest land and 37.014 ha is non-forest land which belongs to Tata Power. | During PSC-1 meeting DCF Pune submitted that the 'nature of the land' (admeasuring about 97.05 Ha) is 'reserved forest' as per the forest records and the 'nature of the land' (admeasuring 3.62 Ha) is 'private forest' as per the forest records. |
| Length of Penstock | Annexure 3 Para (xii) 3. | 1026.41 m | 1126.06 m | To avoid the negative pressures & bends in water conductor system, penstock alignment changed slightly (no changes in alignment in plan) & hence length of water conductor system increased slightly. |
| Rated Head | Annexure 3 Para (viii) | gross head of about 301.03 m available at project site. | rated head of about 301.13 m available at project site. | Rated head changed slightly as size of water conductor system changed during preparation of detailed design report |
| Live Storage Capacity | Annexure 3 Para (xii) 1. | 15.33 MCM (0.54 TMC) | 15.15 MCM ( 0.53 TMC) | During preparation of Detailed project report with updated survey data, area capacity curve has been updated & found slight changes in live storage. |
| Length of embankment | Annexure 3 Para (xi | 4732.77 m | 4440.75 m | During design stage, type of the dam has been |

| | | | | |
|---|---|---|---|---|
| dam | i) 1. | | | changed from Asphalt face rockfill dam to Geomembrane faced rock fill dam. |
| Tail Race Tunnel | Annexure 3 Para (xiii) 8. | 8 Numbers of circular shaped Tail race tunnel having length of about 145.65 m. | 6 Numbers of circular shaped Tail race tunnel having length of about 156.93 m. | Considering the hydraulic short circuit requirement, 6 nos. tailrace tunnels have been proposed. |
| Diversion arrangement | Annexure 3 Para (xiii) 10. | A diversion arrangement at the lower reservoir (existing Shirawta reservoir) for the construction of lower intake and for the connection of TRT to existing Shirawta reservoir | No diversion arrangement will be required for the construction of lower intake. A coffer dam will be planned to isolate the area for the construction of lower intake. | Coffer dam will be constructed to isolate the area. |
| Dimensions of Surface Powerhouse | Annexure 3 Para (xiii) 4. | 251.0 m (L) x 28.0 m (W) x 70.0 m (H) | 255.0 m (L) x 28.0 m (W) x 70.1 m (H) | Slight change in length of powerhouse during DPR preparation as more information & design for electromechanical components is available. |
| Dimensions of tail race tunnels | Annexure 3 Para (xiii) 9. | Out of 7 tunnels, 5 tunnels are having diameter of 6.40 m & two tunnels are 4.50 m diameter. | Out of 7 tunnels, 5 tunnels are having diameter of 5.50 m & two tunnels are 3.90 m diameter. | In earlier proposal, tail race tunnels were concrete lined & during detailed design it is found that steel lined tunnel will be technically more suitable & based on economical diameter consideration, diameter of tunnel has been changed. |
| Design Dis | Annexure | 676.51 cume | 672.9 cumec | Design discharge chan |

| | | | | |
|---|---|---|---|---|
| charge | 3 Para (ix) | c | | ged slightly as size of water conductor syste m changed during prep aration of detailed desi gn report |

- The Ministry vide letter dated 23.09.2023 granted Terms of Reference with the condition that the EAC shall conduct site visit before considering the proposal for grant Environmental Clearance. Accordingly, based on request received from M/s Tata Power Ltd, the EAC sub-committee conducted site visit on 23.02.2024 by the following members:
    a. Shri Ajay Kumar Lal, Chairman
    b. Dr J V Tyagi, Member
    c. Shri Kartik Sapre, Member
    d. Dr Saurabh Upadhyay, Member
- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting.
- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

**3.2.3. Deliberations by the committee in previous meetings**

N/A

**3.2.4. Deliberations by the EAC in current meetings**

The EAC after detailed deliberation observed the increase in forest land from 60.1 ha to 160.783 ha due to change in nature of ownership of the land. Earlier, PP thought that the said land is owned by them and considered as non-forest land, however while submitting the proposal of forest clearance, it was found that the said land is reserved forest for which forest clearance has to be obtained by PP. Accordingly, there is change in area of forest land from non-forest area, with very slight changed in total area of the project i.e. from 197.9 ha to 197.797. Further, various other amendments in ToR such as Length of Penstock, Rated Head, Live Storage Capacity, Length of embankment dam, Tail Race Tunnel, Diversion arrangement, Dimensions of Surface Powerhouse, Dimensions of tail race tunnels and Design Discharge were observed based on data collected for preparation of Detailed Project Report (DPR). Also, it was desired that the recommendations of the sub-committee of EAC that has visited the site on 23.02.2024, shall be followed by the project proponent before submission of EC application by the project proponent.
It was further observed that instant project lies in Western Ghats of Maharashtra state for which Ministry has issued Draft Notification of Eco-Sensitive Area dated 6$^{th}$ July, 2022. From this, it can be observed that New Hydropower projects and its activities are under regulated areas and shall be allowed as per the Environment Impact Assessment notification, published vide number S.O. 1533 (E), dated the 14th September, 2006 with certain terms and conditions mentions therein.
Based on the information submitted and as presented **recommended** the proposal for grant of amendment in Terms of References (ToR) dated 23.09.2023 as proposed by the PP to the project for Shirawta Off Stream Open Loop Pumped Storage Project (1800 MW) in an area of 197.9 ha (change in land use with increase in forest area from 60.10 ha to 160.783 ha) at Village Khandshi, Tehsil Maval, District Pune, Maharashtra by M/s The Tata Power Company Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional ToR:

### 3.2.5. Recommendation of EAC

| |
|---|
| Recommended |

### 3.2.6. Details of Terms of Reference

### 3.2.6.1. Specific

| **Specific Condition** | |
|---|---|
| 1. | |
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| 12. | |
| 13. | |

### 3.3. Agenda Item No 3:

### 3.3.1. Details of the proposal

| **Kalai II Hydro Electric Project** by **THDC INDIA LIMITED** located at **ANJAW,ARUNACHAL PRADESH** | | | |
|---|---|---|---|
| **Proposal For** | | Fresh ToR | |
| **Proposal No** | **File No** | **Submission Date** | **Activity (Schedule Item)** |
| IA/AR/RIV/466561/2024 | J-12011/40/2009-IA-I(R) | 10/04/2024 | River Valley/Irrigation projects (1(c)) |

**3.3.2. Project Salient Features**

The proposal is for grant of Terms of Reference to the project Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW in an area of 1100 Ha located in Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited.

**10.3.2** The Project Proponent along with consultant M/s WAPCOS, made a detailed presentation on the salient features of the project and informed that:

i. M/s THDC India Limited proposes to construct Kalai-II Hydro-Electric Project (HEP) with a capacity of 1200 MW in Anjaw district, Arunachal Pradesh. The Kalai-II H.E. Project envisages Run of the River with pondage scheme on the Lohit river, a left bank tributary of Brahmaputra river with a view to utilize flows of Lohit river over large head available for hydro power generation.

ii. The project aims to harness the abundant water resources of the Lohit River, with a gross head of approximately 125m positioned strategically upstream of Hutong-II HEP and downstream of Kalai-I HEP on the same river. The project is located in the vicinity of the Chingwanti bridge near Hawai Town.

iii. The Kalai-II HE Project envisages utilization of a gross head of about 125m for power generation with an installed capacity of 1200MW. The coordinates of Kalai-II HE Project are Latitude 27o 54' 20" N and Longitude 96o 48' 16" E. The full reservoir level (FRL) is at EL 904.80m.

iv. The project involves construction of a concrete gravity dam, upstream & downstream coffer dam, diversion tunnel, intake tunnel, pressure Shafts, underground Powerhouse complex, surge chamber and Tail Race Tunnel etc. The total optimized land requirement for the project including underground structures is 1100 Ha.

v. **Background**: The Project was initially allotted to Kalai Power Private Limited (KPPL) (a subsidiary of Reliance Power Limited). The Terms of Reference (ToR) was accorded by MoEF&CC to Kalai Power Private Ltd. vide letter 09.12.2009 for a period of 04 years, which was further extended for 01 year vide letter dtd. 05.02.2014. Further, for grant of Environment Clearance (EC), MoEF&CC vide letter dtd. 20.05.2015 informed that EC for Kalai-II HEP has been approved by the competent authority and shall be issued on producing Stage-1 Forest Clearance (FC). The baseline data for 03 seasons has already been collected earlier as per ToR.

vi. There is no change in the scope of the Project and other site conditions which are consistent with earlier approved DPR. The process of Public Consultation in accordance to EIA Notification 2006 was also completed in 2014 by the previous Project developer. However, the previous developer did not pursue the case of FC further due to which the Project could not take off and EC could not be issued in absence of Stage-1 FC. Consequently, EC could not be transferred in the name of THDCIL from previous developer as it was only approved but not issued by MoEF&CC.

vii. Project Cost: The estimated project cost is Rs 12801.54 Cr (Submitted to CEA for approval & is under review). The total capital cost earmarked towards environmental pollution control measures is Rs 19.473 Cr and the Recurring cost (operation and maintenance) will be about Rs 0.187 Cr per annum; as per approved EIA/EMP-2014.

viii. Project Benefit: Total Employment will be 100 persons as direct & 1000 persons indirect. Industry proposes to allocate Rs 32.011 Crore @ of 0.25% of project cost towards CER (as per Ministry's OM dated 01.05.2018).

ix. Environmental Sensitive area: There are No national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. The project is proposed on the Lohit River.

x. MoU / any other clearance/ permission signed with State government: THDCIL has signed a Memorandum of Agreement (MoA) with Govt. of Arunachal Pradesh on 30.12.2023 for the execution of 1200 MW Kalai-II Hydroelectric Project located in Anjaw District of Arunachal Pradesh.

xi. Resettlement and rehabilitation**:** The R&R Plan shall be prepared as per the norms of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

xii. Alternative Studies:

| S.No | Description | Alternative- Site-I | Alternative-Site-II |
|---|---|---|---|
| 1 | Location | Located approximately 3. 7 km d/s of Chingwanti B ridge.<br>Latitude (N): 27° 54′ 20″<br>Longitude (E): 96° 48′ 1 6″ | Located approximately 2.0 k m km d/s of Chingwanti Brid ge<br>Latitude (N): 27° 53’ 34.09“ N<br>Longitude (E) : 96° 48’ 47.6 5“ E |
| 2 | Dam | Height – 198m above dee pest foundation<br>Width – 272 m<br>Left Abutment Occupied by Overburden – 70 m ap prox.<br>Excavation Volume – 35 Lakh Cum<br>Concrete Volume – 21.49 lakh Cum | Height – 188m above deepes t foundation<br>Width – 398 m<br>Both Abutment occupied by overburden – 32 to 50 m app rox.<br>Excavation Volume – 38.6 L akh Cum<br>Concrete Volume – 23.40 la kh Cum |
| 3 | Power Hous e | Located in fair to good qu ality of rock-mass. | Possibility of encountering S heared and shattered rock-m ass based on sheared rock en countered in borehole. |
| 4 | Tail Race T unnel | The length of TRT would be short. | The length of TRT would be very long (additional 6.3 km s) |
| 5 | Reservoir G ross Volume | Larger Retention Volume for Sediment | Lesser Retention Volume |
| 6 | Cost | | |
| Conclusion | | | |

xiii. The Salient features of the project are as follows:

| | |
|---|---|
| Name of the Proposal | Kalai II Hydro Electric Project (Run-of-the-River) of 1 200 MW located in Tehsil Hawai Town, District Anja w, Arunachal Pradesh by M/s THDC India Limited |
| Location<br>(Including coordinates) | Anjaw District, Arunachal Pradesh<br>Lat: $27^0$54’ 20” Long $96^0$48’16” |
| Inter- state issue involved | No |

| | |
|---|---|
| Seismic zone | Zone V |

| | |
|---|---|
| Category of the project | 1 (c) |
| Provisions | As per Schedule of EIA Notification 2006 |
| Capacity / Cultural Command Area (CCA) | 1200 MW |
| Attracts the General Conditions (Yes/No) | No |
| Additional information (if any) | NIL |

| | |
|---|---|
| Powerhouse Installed Capacity | 1200 MW |
| Generation of Electricity Annually | 4852.95 GWh |
| No. of Units | 6*190 MW + 1*60 MW (07 units) |
| Additional information (if any) | No |

| | |
|---|---|
| Cost of project | 12801.54 Cr (Submitted to CEA for approval) |
| Total area of Project | 1100 Ha |
| Height of Dam from River Bed (EL) | 128.5 m |
| Length of Tunnel/Channel | The total length of five Nos of 7.5 m dia HRTs is 534.7 m and for 8.5 m dia HRT is 63.3 m .<br>Total length of 3 nos. TRT is 3939 m plus Length of 01 Auxiliary TRT is 333 m. |
| Details of the Submergence area | 638.456 Ha |
| Types of Waste and quantity of generation during construction/ Operation | Domestic Solid Waste, Hazardous Waste, and Muck. |
| E-Flows for the Project | As per the table given below. |
| Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then | Yes, Cumulative Impact assessment and carrying capacity study of Lohit Basin, 2016. |
| a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin.<br>b) If not the E-Flows maintain criteria for sustaining river ecosystem. | a) Listed As per the table given below. |

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|---|---|
| No. of proposed disposal area/(type of land-Forest/Pvt. land) | 05 sites, Forest land |
| Muck Management Plan | Shall be covered as apart of EIA Study |
| Monitoring mechanism for Muck Disposal | Shall be covered as apart of EIA Study |
| Private land | Nil |
| Government land/Forest Land | 963.764 Forest Land |
| Submergence area/Reservoir area | 638.456 ha |
| Land required for project components | 1100 Ha |
| Additional information (if any) | A proposal for 963.764 Ha of forest land has been submitted and is under process of approval.<br>Additional 136.236 ha of land in the under-identification stage for base camp township, store, office, weigh bridge, EM & HM store, cement & steel stockyard.<br>The remaining land shall be acquired as per prevailing norms for Pvt land, Govt land or Forest land, as applicable. |

| **Forest Land/ Protected Area/ Environmental Sensitivity Zone** | **Yes/No** | **Details of Certificate/letter/Remarks** |
|---|---|---|
| Reserve Forest (RF)<br>Protected Forest Land | 295.986 Ha<br>R.F.<br>Nil | Application for Stage-I FC was submitted on 23.01.2024 for 295.986 ha of reserve forest along with 667.778 ha of unclassed Forest. |
| National Park | Nil | |
| Wildlife Sanctuary | Nil | |
| Court Case | NIL | |
| Additional information (if any) | | |
| Affidavit/Undertaking | Attached | |
| Additional information (if any) | | |

| **Particulars** | **Letter no. and date** |
|---|---|
| Certified EC compliance report (if applicable) | NA |

| | |
|---|---|
| Status of Stage- I FC | Proposal No FP/AR/HYD/IRRIG/459593/2024 was submitted on 23.01.2024. |
| Additional detail (If any) | The Project was initially allotted to Kalai Power Private Limit ed (a subsidiary of Reliance Power Limited).<br>EAC recommended the issuance of EC vide its 81st meeting he ld on 28.01.2015 based on the EIA/EMP study and PH conduc ted 2014.<br>After that MoEF&CC vide its letter No. J-12011/40/2009-IA.I dtd 20.05.2015 conveyed that Environment Clearance (EC) for Kalai-II HEP has been approved by the competent authority an d EC letter shall be issued on production of Stage-1 Forest Cle arance (FC).<br>The proposal case for seeking Stage-1 Forest Clearance was in itiated in February 2013 and the same could not take off.<br>Meanwhile, THDCIL has entered into a Memorandum of Agre ement (MoA), executed between the Hon'ble Governor of Aru nachal Pradesh and THDC India Ltd on dtd 30.12.2023 for the execution of 1200 MW Kalai-II Hydroelectric Project.<br>A fresh application for Forest Clearance has been submitted on 23.01.2024.<br>Since EC was approved only, and was not issued, hence, the sa me could not be transferred in the name of THDCIL.<br>Accordingly, the present proposal for the issuance of ToR has been submitted on 23.03.2024. |
| **Is FRA (2006) done for FC-I** | FRA certificate issued vide Letter dated 14.11.2014 and 22.02.2 024. |

| **Particulars** | **Details** |
|---|---|
| Details of consultant | M/s WAPCOS Limited |
| Project Benefits | Ø Capacity addition of 1200 MW in the North-East Region, m eeting power-requirement of the region.<br>Ø Annual Energy Generation of ~ 4852.95 GWh of electricity<br>Ø Integrated Development of the region in the areas of employ ment, communication, education, health, tourism,<br>Ø 12% free power will be provided to the home state of Aruna chal Pradesh.<br>Ø In addition, 1% power/revenue shall be utilized for contribut ion towards local area development. |
| Status of other statutory cleara nces | Environment Clearance: Applied<br>Forest Clearance: Applied<br>Wildlife Clearance: Not Applicable |
| R&R details | Shall be covered as apart of EIA Study |
| Additional detail (If any) | Nil |

**10.3.3** 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 Terms of Reference (ToR) for conducting EIA study of the project for setting up of Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW in an area of 1100 Ha located in Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited.

- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.
- Ministry has granted TOR vide letter dated 09.12.2009 to Kalai Power Private Limited (KPPL) (a subsidiary of Reliance Power Limited) for a period of 04 years, which was further extended for 01 year vide letter dtd. 05.02.2014. In 2015, EC for Kalai-II HEP has been approved by the competent authority and shall be issued on producing Stage-1 Forest Clearance (FC). The case of grant of FC was not followed due to which EC could not be issued in absence of Stage-1 FC.
- The Committee expressed dissatisfaction that KPPL after undertaking the project and elapsing 5 precious years abandoned it without giving any reason, and the data thus generated was not also shared with the present proponent. Hence, it is important that a certificate from the present proposer be taken indicating expertise availability and a commitment to completion, if the project gets through for implementation. The present PP THDCIL submitted an unsigned (with initials only and without any other details and official seal) executive summary document. The EAC added that a signed document would typically indicate official endorsement, accountability, and commitment to the contents presented. It is also made clear why a more environment friendly PSP was not proposed by THDCIL instead of a dam-reservoir hydropower project (R-o-R) after KPPL abandoned it mid-way.
- The EAC reviewed on the water availability data for the River Lohit submitted by the PP from 2002-03. The committee expressed dissatisfaction because the PP had completed the entire Environmental Impact Assessment (EIA) study a decade ago and is still designing the project based on water availability data from 20 years ago. PP has further informed to the committee that they have requested CWC to provide committee latest data on the water availability in the region.
- The committee's emphasis on sediment transportation from the upper reaches and the large catchment area of the Lohit River underscores a critical aspect affecting the feasibility and sustainability of the project. Further, deliberated that sediment transport can indeed have substantial implications for the design, operation, and maintenance of hydroelectric projects, particularly in terms of reservoir siltation and sediment deposition. The committee's concern over the viability of the project reflects legitimate worries about the long-term effectiveness and economic sustainability given these challenges. Addressing sediment transport issues would likely require comprehensive sediment management strategies, such as upstream erosion control measures, sediment trapping techniques, or periodic dredging activities.
- The EAC observed that the PP stated in the Form 1 submission on Parivesh that there were no violations associated with the proposed project. However, when the PP submitted the undertaking to the Ministry for consideration of the proposal, no specific details were provided regarding the same.

**3.3.3. Deliberations by the committee in previous meetings**

N/A

**3.3.4. Deliberations by the EAC in current meetings**

The EAC after detailed deliberation observed that instant project of ToR for Hydroelectric projects lacks detailed data analysis already available with PP in a way of approved DPR and earlier EIA report. The PP shall present the available data with respect to hydrology/available water resources, sediment load, submergence area required for sediment to settle, silt load etc. for redesigning or changes (if required) instead of following earlier approved details. The committee's concern over the viability of the project reflects legitimate worries about the long-term effectiveness and economic sustainability given these

challenges. It was also desired that PP shall consider the alternative of implementing Pump Storage Project (PSP) instead of conventional Hydroelectric project. If PSP is not feasible then technical details and reason has to be submitted.

In view of above and the information submitted and as presented, EAC has desired additional information on following observation for further consideration of the project:

i. Latest Water availability data shall be obtained CWC and hydro-graph of annual discharge based on historical data. E-flow based on hydrology and aquatic biology sustenance be re-calculated based on latest data and in variable climate conditions.
ii. PP shall explore the possibility of implementing PSP instead of conventional Hydroelectric project and if PSP is not feasible then technical details and reason has to be submitted
iii. Detailed study and assessment shall be carried to evaluate the potential effects of sediment transport on the proposed project.
iv. All international boundary related clearances including clearance from Ministry of Defence shall be obtained from the concerned authorities and be submitted with supporting documents
v. An affidavit shall be submitted stating that there is no construction done at the site and no violation of EP Act (1986), Water Act (1974), Air Act (1981), Forest Act (1980) and wild life protection act (1972) has been done.
vi. Letter from DFO shall be obtained stating that project does not fall under any wildlife corridor.
vii. PP shall resubmit the proposal with revised layout of muck disposal site outside the forest area and overall minimizing the forest land for the proposed project.
viii. To submit the current status of 136.236 ha land which is under identification stage and to submit the status along with details of previous FC clearance proposal submitted to Ministry in 2014-2015.
ix. Secondary data of presence/occurrence of wildlife in consultation of forest department and local people shall be provided.
x. The PP shall submit NOC from previous owner in respect to the change in ownership of the said project.

The project was ***deferred*** on above lines.

**3.3.5. Recommendation of EAC**

Deferred for ADS

**3.4. Agenda Item No 4:**

**3.4.1. Details of the proposal**

| **Malshej Ghat Bhorande Pumped Storage Project (1440 MW)** by **ADANI GREEN ENERGY LIMITED** located at **PUNE,MAHARASHTRA** | | | |
|---|---|---|---|
| **Proposal For** | | Amendment in ToR | |
| **Proposal No** | **File No** | **Submission Date** | **Activity (Schedule Item)** |
| IA/MH/RIV/461164/2024 | J-12011/21/2022-IA.I (R) | 15/04/2024 | River Valley/Irrigation projects (1( c)) |

**3.4.2. Project Salient Features**

The proposal is for amendment in Terms of Reference to the project Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited.

**10.4.2** 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. Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW at village Adoshi 8- Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra).

ii. The Upper reservoir (new) is proposed on hilltop across seasonal minor rivulet/ nallah draining into kukadi river and lower reservoir (new) proposed across seasonal minor rivulet/ nallah draining into Kalu river. The proposed Malshej Ghat Bhorande is planned an Off-Stream Closed Loop Pumped Storage Scheme. The live storage of upper reservoir is 7.04 and lower reservoir is 8.15 MCM.

iii. The proposal is for amendment in the Terms of Reference granted by the Ministry vide letter dated 24/03/2023 for the project Malshej Ghat Bhorande Pumped Storage Project of capacity 1440 MW at village Adoshi 8- Bhorande, Tehsil Junnar & Murbad, District Pune 8 Thane (Maharashtra) by M/s Adani Green Energy Limited.

iv. The project proponent has requested for amendment in the ToR with the details are as under:

| S. No | Para of ToR issued | Details as per the ToR | To be revised/ read as | Justification/ reasons |
|---|---|---|---|---|
| 1. | Subject | Malshej Ghat Bhorande Pumped Storage Project of capacity 1440 MW at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited. | Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited. | The increase in project capacity from 1440MW (6 X 240) to 1500MW (4x300 + 2x150) is for maintaining standard unit size of 300 MW and for obtaining operational flexibility. |
| 2. | Para 2 | The Ministry of Environment, Forest and Climate Change has considered the application. It is noted that the proposal is for grant of ToR to the project for Malshej Ghat Bhorande Pumped Storage Project of capacity 1440 MW in an area of 116.5 ha at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited. | The Ministry of Environment, Forest and Climate Change has considered the application. It is noted that the proposal is for grant of ToR to the project for Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW in an area of 166.26 ha at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited. | The land area has increased (116.5ha to 166.26ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based on detailed survey & investigations, whereas earlier land details were based on the Preliminary feasibility. |
| 3. | Para 5 (i) | The proposal is for grant of terms of reference to the project for Malshe | The proposal is for grant of terms of reference to the proje | The increase in project capacity from 1440MW (6 X 240) t |

| | | | | |
|---|---|---|---|---|
| | | j Ghat Bhorande Pumped Storage Project of capacity 1440 MW in an area of 116.5 ha at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited. | ct for Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW in an area of 166.26 ha at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited. | o 1500MW (4x300 + 2x150) is due to for maintaining standard unit size of 300 MW and for obtaining operational flexibility.<br>The land area has increased (116.5ha to 166.26ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based on detailed survey & investigations, whereas earlier land details were based on the Preliminary feasibility. |
| 4. | Para 5 (ii) | Malshej Ghat Bhorande is an Off-Stream Closed Loop Pumped Storage Scheme with an installed capacity of 1440 MW (6 x 240 MW). The Upper reservoir (new) is proposed on hilltop across seasonal minor rivulet/ nallah draining into kukadi river and lower reservoir (new) proposed across seasonal minor rivulet/ nallah draining into Kalu river. The quantum of water required for initial/ one time filling of reservoirs (i.e. 11.2 MCM) shall be pumped from existing reservoir of Manikdoh dam during monsoon months. Malshej Ghat Bhorande PSP has been designed to meet the peeking requirement daily in the southern region grid and state of Maharashtra for the duration of about six (6) hours. | Malshej Ghat Bhorande is an Off-Stream Closed Loop Pumped Storage Scheme with an installed capacity of 1500 MW (4x300 + 2x150). The Upper reservoir (new) is proposed on hilltop across seasonal minor rivulet/ nallah draining into kukadi river and lower reservoir (new) proposed across seasonal minor rivulet/ nallah draining into Kalu river. The quantum of water required for initial/one time filling of reservoirs (i.e. 9.88 MCM) shall be pumped from nearby Kalu River. Malshej Ghat Bhorande PSP has been designed to meet the peeking requirement daily in the southern re | The optimization in quantum of water required for initial/one time filling of reservoirs from 11.2 MCM to 9.88 MCM is as per detailed study during the DPR stage,<br>Earlier it was proposed to use the Manikdoh reservoir which is part of krishna basin. Therefore, it is now proposed to pump from Kalu river to Lower reservoir to avoid ISM. |

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| | | | gion grid and state of Maharashtra for the duration of abo ut six (6) hours. | |
| 5. | Para 5 (iii) | The upper dam is propo sed on a tabletop hill ne ar Adoshi village in Jun nar Taluka, Pune distric t of Maharashtra state h aving a geographical lat itude 19° 17' 59.3" N an d longitude 73° 41' 27. 7" E. The lower dam is proposed near Bhorand e village in Murbad Tal uka, Thane district of Maharashtra State with the geographical latitud e 19° 18' 43.1" N and lo ngitude 73° 40' 30" E. The project area lies in the Sahyadri Ranges of Western Ghats in the St ate of Maharashtra in th e area bordering Pune a nd Thane districts. | The upper dam is p roposed on a tablet op hill near Adoshi village in Junnar Ta luka, Pune district of Maharashtra stat e having a geograp hical latitude 19° 1 7' 59.3" N and long itude 73° 41' 27.7" E. The lower dam i s proposed near Bh orande village in M urbad Taluka, Than e district of Mahara shtra State with the geographical latitud e 19° 18' 43.1" N a nd longitude 73° 4 0' 30" E. The proje ct area lies in the S ahyadri Ranges of Western Ghats in th e State of Maharash tra in the area bord ering Pune and Tha ne districts. | No Change |
| 6 | Para 5 (iv) | The proposed Malshej Gha t Bhorande PSP (6 x 240 MW) envisages following major civil structures:-<br>a. Upper Dam (RCC Dam): Crest length 1990 m, m aximum height 37 m a bove the deepest riverb ed level. Gross storage capacity of Upper reser voir is 8.8 Mm3.<br>b. Lower Dam (RCC Da m): Crest length 870 m, maximum height 67 m above the deepest ri verbed level. Gross sto rage capacity of Lower reservoir is 9.6 Mm3.<br>c. Upper Intake/ Outlet: Ho rizontal pit type intake, 4 nos. of trash rack bay s, each unit with a size of 7.25 m (W) x 15.0 | The proposed Malshej Ghat Bhorande PSP (4 x 300 + 2 x 150) envisa ges following major civ il structures:-<br>a) Upper Dam (RCC Da m): Crest length 196 7 m, maximum heig ht 30.5 m above the deepest riverbed lev el. Gross storage cap acity of Upper reser voir is 7.95 Mm3.<br>b) b. Lower Dam (RCC Dam): Crest length 712 m, maximum he ight 64.5 m above th e deepest riverbed le vel. Gross storage ca pacity of Lower rese | The changes are as per the technical ev aluation done by th e various directorat es of CEA, CWC, GSI for approval of DPR. |

| | | | | |
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| | | m (H).<br>d. Lower Intake/ Outlet: Horizontal pit type intake, 4 nos. of trash rack bays, each with a size of 6.5 m (W) x 15.0 m (H).<br>e. Pressure Shaft: 1660 m (length), 8.5 m (diameter), Circular shaped, steel lined and branching near powerhouse<br>f. Surface Powerhouse: 180 m (L) x 23 m (W) x 45 m (H)<br>g. Tailrace Tunnel: 65 m (length), 8.5 m (diameter), horseshoe shaped, concrete lined.<br>h. Approach Road<br>Ø Strengthening of existing roads – 3 km<br>Ø Construction of new road – 4 km<br>Adit to bottom of pressure shaft - 620 m (length) x 7.6 m (width) x 8.5 m (height), D-shaped, unlined. | rvoir is 8.97 Mm3.<br>c) Upper Intake/ Outlet: Horizontal pit type intake, 5 nos. of trash rack bays, each unit with a size of 5.2 m (W) x 4.2 m (H).<br>d) Lower Intake/ Outlet: Horizontal pit type intake, 3 nos. of trash rack bays, with a size of 7.1m (W) x 6.2 m (H) (Large) and 5 m(W) x 5m (H) (Small)<br>e) Pressure Shaft: 1134 m (length), 3.7 m (diameter), Circular shaped, steel lined and branching near powerhouse.<br>f) Underground Powerhouse: 217 m (L) x 22 m (W) x 50 m (H).<br>g) Tailrace Tunnel: 3 nos. of tunnel, 582 m (length), 6.0m (2 no) & 5.0m (1 no).<br>h) Approach Road<br>Ø Strengthening of existing roads – 3 km<br>Ø Construction of new road – 4 km<br>i. Adit tunnel<br>Ø *Mat (Size & Type)- 1320m (L) x 8.0m Dia. D-shaped*<br>Ø ADIT-1 (Size & Type)- 685m (L) x 7.5m Dia. D-shaped;<br>Ø *ADIT-2 (Size & Type)- 465m (L) x 6.5m Dia. D-shaped*<br>Ø *ADIT-3 (Size & Type)- 495m (L) x 7.5m Dia. D-shaped*<br>Ø *Escape-1 (Size & Type)- 465m (L) x 6.5m Dia. D-shaped*;<br>Ø *Escape-2 (Size & Type)- 200m (L) x 6.5m Dia. D-shaped* | |

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| 7. | Para 5 (v) | Land requirement: The total land required for t he project components and related works has b een estimated to be abo ut 116.5 ha, which incl udes 44.9 ha of forest la nd and 71.6 ha of privat e land. Being an off-riv er PSP, the environmen tal impacts of the proje ct are minimal. | Land requirement: The total land requi red for the project c omponents and rela ted works has been estimated to be abo ut 166.26 ha, which includes 60.49 ha o f forest land and 10 5.77 ha of private l and. Being an off-ri ver PSP, the enviro nmental impacts of the project are mini mal. | The land area ha s increased (116. 5 ha to 166.26 h a) under utilities and RoW after d etailed engineeri ng whereas earlie r land details wer e based on the Pr oject Prefeasibili ty. |
| 8. | Para 5 (vi) | The cost of the project i s Rs. 5860 Crores at 20 22-23 price level includ ing Interest During Con struction (IDC) of Rs. 6 35 Crores. As a prelimi nary estimate, a constru ction period of 5 years ( 60 months) from the da te of award of civil wor ks package has been est imated for this project. | The cost of the proj ect is Rs. 7047.6 Cr ores at 2023-2024 p rice level including Interest During Co nstruction (IDC) of Rs. 1198.81 Crores. As a preliminary es timate, a constructi on period of 5 year s (60 months) from the date of award o f civil works packa ge has been estimat ed for this project. | The project cost i s increased from INR 5860 Crore to INR 7047.6 Cr ore is due to an i ncrease of the pr oject capacity, m achineries, equip ment's etc. |
| 9. | Para 5 (vii) | Proposed Project is loca ted outside the Protecte d area and located more than 10 km away from boundary of Bhimashan kar Wildlife Sanctuary (WLS) & Kalsubai Hari shchandragad WLS. Th e final notification for ESZ of Bhimashankar WLS & Kalsubai Haris hchandragad WLS publ ished by MOEF vide no tification dated 6th Aug ust 2020 & 28th April 2 017 respectively and th e proposed project is lo cated outside the notifie d ESZ boundaries of bo th WLS. | Proposed Project is located outside the Protected area and l ocated more than 1 0 km away from bo undary of Bhimash ankar Wildlife San ctuary (WLS) & Ka lsubai Harishchand ragad WLS. The fi nal notification for ESZ of Bhimashan kar WLS & Kalsub ai Harishchandraga d WLS published b y MOEF vide notifi cation dated 6th Au gust 2020 & 28th A pril 2017 respective ly and the proposed project is located o | No Change |

| | | | | |
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| | | | utside the notified ESZ boundaries of both WLS. | |
| 10. | Para 5 (vii i) | The proposed project is falling under ESA of W estern Ghat as per MO EF draft ESA notificati on dated 6th July 2022. | The proposed proje ct is falling under E SA of Western Gha t as per MOEF draf t ESA notification dated 6th July 202 2. | No Change |

**10.4.3** 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 amendment in terms of references (ToR) granted by the Ministry vide letter dated 24.03.2023 to the project for Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited.
- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.
- The EAC noted that land requirement has been changed from 116.5 ha to 166.26 ha which includes increase in forest land from 44.9 ha to 60.49 ha and private land from 71.6 ha to 105.77 ha. Also, PP submitted the proposal for modification in the capacity generation from 1440 MW to 1500 MW and source of water from Manikdoh to Kalu River with pipeline of 3.5km has been changed. Further, PP has sought various amendment in ToR such as change on design of Upper dam, Lower Dam, Upper Intake/Outlet, Lower Intake/Outlet, Tail Race Tunnel, Pressure Shaft, Powerhouse, and Annual Power generation.
- The EAC observed that forest area has been increased which raised concern over loosing more forest land with minimal increase the project capacity. The committee deliberated that the project aims for minimal increase its capacity corresponding to large forest cover, therefore it is essential to consider the quality and ecological value of the forest areas being impacted versus the new areas being added.

It was further observed that instant project lies in Western Ghats of Maharashtra state for which Ministry has issued Draft Notification of Eco-Sensitive Area dated 6th July, 2022. From this, it can be observed that New Hydropower projects and its activities are under regulated areas and shall be allowed as per the Environment Impact Assessment notification, published vide number S.O. 1533 (E), dated the 14th September, 2006 with certain terms and conditions mentions therein.

**3.4.3. Deliberations by the committee in previous meetings**

N/A

**3.4.4. Deliberations by the EAC in current meetings**

The EAC after detailed deliberation observed that the instant proposal is for amendment in ToR dated 24.03.2023 for changed in capacity, area of the project, water source from Manikdoh to Kalu River with reduced distance of pipeline and certain changes in reservoir. It was observed that necessary permission for changed water source shall be obtained by PP from State Government. Also, data on water availability, e-flow as per Hon'ble NGT order and PP's proposal to fill the proposed reservoir in two years shall be submitted during appraisal of EC. PP has submitted the relevant justification for the

proposed changes in the details of the project and amendment in ToR.
Further, one of the NGO has raised certain observation regarding this project such as presence of wildlife and its corridor connecting Harishchandragad-Kalsubai Wildlife Sanctuary, Bhimashankar Wildlife Sanctuary, Tansa Wildlife Sanctuary, Tungareshwar Wildlife Sanctuary, and Sanjay Gandhi National Park. and man-animal conflict, archaeological sites in the 10 km of buffer area of project, impact on project due to climate change etc.
Based on the information submitted and as presented, the EAC **recommended** the proposal for grant of amendment in terms of references (ToR) as proposed by the PP to the project for Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional ToR:

**3.4.5. Recommendation of EAC**

| |
|---|
| Recommended |

**3.4.6. Details of Terms of Reference**

**3.4.6.1. Specific**

| **Specific Condition** | |
|---|---|
| 1. | |
| 2. | |
| 3. | |
| 4. | |
| 5. | |
| 6. | |
| 7. | |
| 8. | |

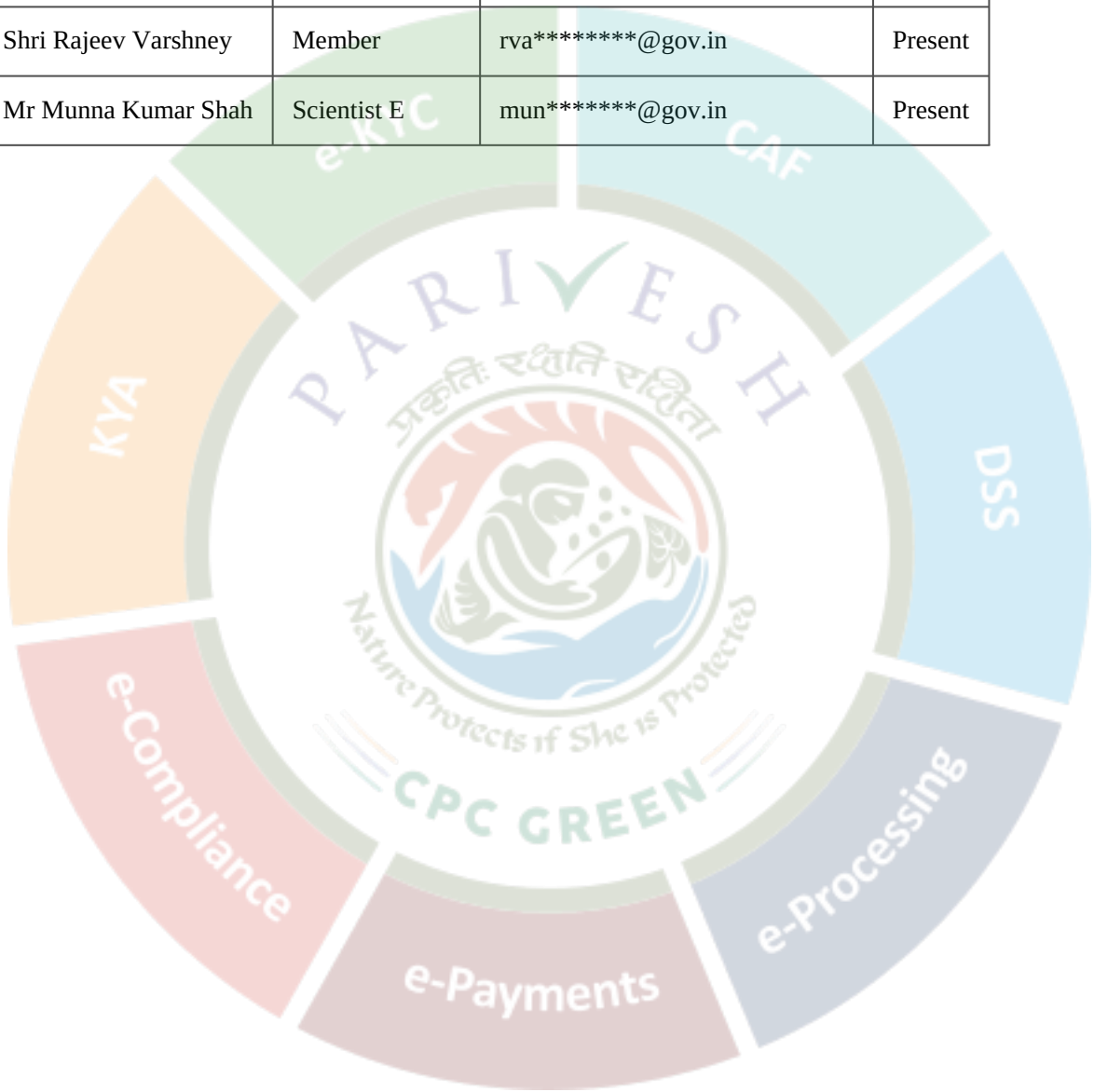
**4. Any Other Item(s)**

| |
|---|
| N/A |

**5. List of Attendees**

| Sr. No. | Name | Designation | Email ID | Remarks |
|---|---|---|---|---|
| 1 | Prof G J Chakrapani | Chairman, EAC | cha**********@gmail.com | Present |
| 2 | Dr Mukesh Sharma | Member (EAC) | muk***@iitk.ac.in | Absent |
| 3 | Dr Uday Kumar R Y | Member (EAC) | uda********@yahoo.com | Present |

| | | | | |
|---|---|---|---|---|
| 4 | Dr J A Johnson | Member (EAC) | jaj@wii.gov.in | Present |
| 5 | Dr J V Tyagi | Member (EAC) | jvt******@gmail.com | Present |
| 6 | Shri Kartik Sapre | Member (EAC) | kar********@gmail.com | Present |
| 7 | Shri Ajay Kumar Lal | Member (EAC) | akl****@gmail.com | Present |
| 8 | Shri Alok Paul Kalsi | Member (EAC) | emo***@nic.in | Present |
| 9 | Dr A K Sahoo | Member (EAC) | ami***@gmail.com | Present |
| 10 | Shri Rajeev Varshney | Member | rva********@gov.in | Present |
| 11 | Mr Munna Kumar Shah | Scientist E | mun*******@gov.in | Present |



**MINUTES OF THE 10TH MEETING OF THE EXPERT APPRAISAL COMMITTEE FOR RIVER VALLEY AND HYDROELECTRIC PROJECTS HELD ON 29TH APRIL 2024 FROM 10:30 AM – 02:30 PM THROUGH VIDEO CONFERENCE.**

The 10th meeting of the EAC for River Valley & Hydroelectric Projects, Ministry of Environment, Forest and Climate Change, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi, was held on 29th April, 2024 through virtual (online) mode, under the Chairmanship of Prof. G. J. Chakrapani. The list of Members present in the meeting is provided in **Annexure.**

The Minutes of the Meeting held on 9th EAC meeting on 20th March, 2024 were confirmed. It was also decided that if the project proponent and/or consultant approaches the committee directly/indirectly for any advice, it be reported to the member-secretary for greater transparency and propriety. Also, the project proponent must ensure that the guidelines of plagiarism are meticulously followed and a duly signed self-certification be attached.

**Agenda No. 10.1**

**Chichlik Pumped Storage Hydro Project (1560 MW) in an area of 317.6 Ha located at Village Argarh, Chichli, Khuraila and Pokharriya, Sub District Robertsganj, District Sonbhadra (Uttar Pradesh) by M/s Avaada Waterbattery Private Limited – Reconsideration of Terms of Reference (TOR) – reg.**

**[Proposal No. IA/UP/RIV/459501/2024; F. No. J-12011/08/2024-IA-I(R)]**

**10.1.1** The proposal is for grant of Terms of References (ToR) to the project for Chichlik Pumped Storage Hydro Project (1560 MW) in an area of 317.6 Ha located at Village Argarh, Chichli, Khuraila and Pokharriya, Sub District Robertsganj, District Sonbhadra (Uttar Pradesh) by M/s Avaada Waterbattery Private Limited.

**10.1.2** The Project Proponent and the accredited Consultant M/s R S Envirolink Technologies Pvt. Ltd. submitted the following information:

i. The Chichlik Off-Stream Closed Loop Pumped Storage project (OCPSP) is proposed between two reservoirs i.e., Chichlik Upper & Lower Reservoirs (both to be constructed newly) and onetime water will be pumped from Sone River to fill up the lower reservoir.
ii. The project area is located to the south of Chichlik and west of Bashuhari villages, falling in Robertsganj tehsil of Sonbhadra district situated in south-east part of the Uttar Pradesh.
iii. Based on the Initial assessment of the project site and alternative study, a Pre-feasibility report was prepared and subsequently further alternative studies were carried out for aligning the layout towards downstream in order to reduce the forest land as advised by EAC during the meeting held on 20th March 2024 for consideration of TOR. Accordingly, as per the revised layout with reduced forest lands related to the Upper Reservoir & Lower Reservoir to be created by construction of 28.00 meter & 24.20-meter-high CFRD dam having gross storage capacities 13.59 MCM & 10.75 MCM respectively.

iv. Water Conductor System with steel Penstock of 3.5 diameter, Surface Powerhouse Complex to house 7 generating units & Tail Race Tunnel. One-time water will be pumped from the Sone River by laying 0.5 km long pipeline to fill up the lower reservoir.

v. The proposed Chichlik PSP (5 x 260 MW + 2x 130 MW) envisages following major civil structures:

- Concrete faced rockfill dam of 1460.20m long & 28.00m high forming the upper reservoir.
- Concrete faced rockfill dam of 2196. 76m long & 24.20m high forming the lower reservoir.
- An average of 240.00m long & 148.00m wide concrete lined approach channel at the upstream of upper intake.
- Six nos. of 60.55m long Diffuser type upper Intake structure with vertical trash rack.
- Concrete gate shaft housing the stoplog/service gates.
- Five nos. of 4.50m dia. Main pressure shaft to feed 5 units of 260MW with One no. of 4.50m dia. Main pressure shaft bifurcate into two nos. of 3.50m dia. Unit Pressure shaft to feed 2 units of 130MW. The maximum length of water conductor system was found to be 1644. 70m with 371.50m long Vertical pressure shaft & 90.75m long unit pressure shaft.
- One no. of 6.50 m (W) x 7 .50 m (D), D -- shaped construction adit of about 570.00 m length for the construction of pressure shaft.
- A pit type surface powerhouse housing 5 Nos. of reversible (fixed speed) units of 260 MW each & 2 Nos. of reversible (fixed speed) units of 130 MW capacity each.
- A transformer I GIS building of size 213.70 m (L) x 16.00 m (W) x 20.00 m (H) & switchyard of 35.15 m width, parallel to the length of powerhouse at the downstream side.
- One no. of 8.50m Dia. D -- shaped MAT/Escape tunnel of about 855.00 m length for the access of Powerhouse.
- Five nos. of 5.00 m dia. & 2 Nos. of 3.50m dia. concrete lined tail race tunnel of 163.30 m length each.
- Seven nos. of 61.55m long diffuser type Lower Intake structure with vertical trash rack.
- An average of 280.00 m long & 168.65 m wide concrete lined approach channel at the downstream of lower intake structure.

vi. The total land required for the construction of various components and related works for Chichlik PSP is estimated to be around 317.6 ha, out of which 106.78 ha is non-forest land and 210.82 ha is forest land. Diversion of forest land for non-forest purpose will be involved for construction of Chichlik project components. Therefore, Forest Clearance is required to be obtained under Forest Conservation Act. The proposed project is located around 3.92 km away from boundary of Kaimur WLS boundary. Any impacts on biodiversity due to development of proposed PSP shall be studied as part of EIA studies.

vii. The estimated project cost is Rs. 7380.90 Crore including IDC. As a preliminary estimate, a construction period of 36 months from the date of award of civil works package has been estimated for this project.

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

- **Project details:**

| | |
|---|---|
| Name of the Proposal | Chichlik Pumped Storage Project |

| | |
|---|---|
| Location<br>(Including coordinates) | Lower Reservoir: 83°27'13.34"E; 24°31'37.74"N<br>Upper Reservoir: 83°26'17.09" E; 24°32'27.95"N |
| Inter- state issue involved | No |
| Seismic zone | Zone-III |

- **Category details:**

| | |
|---|---|
| Category of the project | A |
| Provisions | |
| Capacity / Cultural command area (CCA) | 1560 MW |
| Attracts the General Conditions (Yes/No) | Yes |
| Additional information (if any) | Nil |

- **Electricity generation capacity:**

| | |
|---|---|
| Powerhouse Installed Capacity | 1560 MW |
| Generation of Electricity Annually | 3539.4 MU |
| No. of Units | 7 nos. (5X260 MW+2X130 MW) |
| Additional information (if any) | Nil |

- **ToR/EC Details:**

| | |
|---|---|
| Cost of project | 7380.90 Cr. |
| Total area of Project | 317.6 Ha |
| Height of Dam from River Bed (EL) | Lower Dam – 28.0 m<br>Upper Dam – 24.20 m |
| Length of Tunnel/Channel | 1014.0 m |
| Details of Submergence area | 176.60 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 Off-Stream 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<br>a) E-flow with TOR /Recommendation by<br>b) EAC as per CIA&CC study of River Basin. | No |

| | |
|---|---|
| If not the E-Flows maintain criteria for sustaining river ecosystem. | |

- **Muck Management Details:**

| | |
|---|---|
| No. of proposed disposal area/ (type of land-Forest/Pvt. land) | 80.0 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 | 106.78 Ha |
| Government land/Forest Land | 210.82 Ha |
| Submergence area/Reservoir area | 176.60 Ha |
| Land required for project components | 141.00 Ha |
| Additional information (if any) | Nil |

- **Presence of Environmentally Sensitive areas in the study area**

| **Forest Land/ Protected Area/ Environmental Sensitivity Zone** | **Detail of Certificate / letter/ Remarks** |
|---|---|
| Reserve Forest/Protected Forest Land | Distance from nearest protected area (Kaimur WLS; Bihar) is 3.92 Km, however, proposed project is outside the notified ESZ boundary of the sanctuary. |
| National Park | |
| Wildlife Sanctuary | |

- **Court case details:**

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

- **Affidavit/Undertaking details:**

| | |
|---|---|
| Affidavit/Undertaking | Enclosed |
| Additional information (if any) | Nil |

- **Miscellaneous**

| **Particulars** | **Details** |
|---|---|
| Details of consultant | M/s. R S Envirolink Technologies Pvt. Ltd. (RSET)<br>(NABET Accredited Consultant Organization)<br>Certificate No: NABET/EIA/2225/RA0274<br>Validity: August 15, 2025 |

| | |
|---|---|
| | Name of Sector : River Valley and Hydroelectric<br>Projects Category : A<br>MoEF Schedule : I(C)<br>Address : 403, Bestech Chambers,<br>Block-B, Sushant Lok Phase I, Sector 43, Gurugram,<br>Haryana - 122009 |
| 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%, supporting 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.<br>Further, pumped storage projects are critical to the national economy and overall energy reliability because it is:<br>o Least expensive source of electricity, not requiring fossil fuel for generation<br>o An emission-free renewable source<br>o Balancing grid for demand driven variations<br>o Balancing generation driven variations<br>o Voltage support and grid stability<br><br>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 210.82 Ha after receipt of ToR Approval, alongwith 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 |

**10.1.3** The EAC during deliberations noted the following:

- Earlier, the proposal was considered by the Expert Appraisal Committee (Hydro River Valley Sector) in its 9th meeting held on 20.03.2024 for grant of Terms of Reference (ToR). The EAC deferred the proposal seeking additional information. The PP submitted the replies of observations of EAC on PARIVESH portal. The replies of observations are:

| Sr. No. | Observation | Reply of PP |
|---|---|---|
| 1 | PP shall further analyse the alternative site downstream of the river wherein forest area can be reduced or with revised layout with minimum forest area even with slight change in power capacity. | Alternative study has been carried out in detail considering moving further downstream and with a view to reduce the forest area. Three additional alternatives were considered and Alternative 2 was finalized.<br><br>The forest area in the most optimum proposal (Alternative 2) has been reduced by 23.28 Ha from 184.3 Ha (Lower 102.75 Ha+ Upper 81.55 Ha) to 161.02 Ha (Lower 70.95 Ha+ Upper 90.07 Ha) towards surface components and overall reduction in forest area works out to be 10 Ha including underground components. Detailed alternative analysis has been submitted and presented before the EAC |
| 2 | PP shall submit MoU signed with the State concerned department for setting up the proposed project of 1560 MW capacity and availability of water for the project. | Updated MoU for 1560 MW installed capacity has been signed between Government of Uttar Pradesh and M/s. Avaada Waterbattery Private Limited vide letter dated 27.09.2023 |
| 3 | Secondary data of presence/occurrence of wildlife in consultation in forest department and local people shall be provided. Further, Categorization of the forest land and Land use land cover of the study area based on FSI data shall be provided | The project location falls within the jurisdiction of the Sonbhadra Forest Division, Uttar Pradesh (implanting years 2014-15 to 2023-24). Information regarding the faunal diversity comprising mammals, birds and herpetofauna, is acquired through the discussion with forest officials and referring the working plan of the Sonbhadra Forest Division. The details of various faunal species are given as under:<br><br>**Secondary Data of Presence/Occurrence of Wildlife in Consultation in Forest Department**<br><br>**Faunal Diversity in the Study Area**<br><br>The project location falls within the jurisdiction of the Sonbhadra Forest Division, Uttar Pradesh |

| | | |
|---|---|---|
| | | (implanting years 2014-15 to 2023-24). Information regarding the faunal diversity comprising mammals, birds and herpetofauna, is acquired through the discussion with forest officials and referring the working plan of the Sonbhadra Forest Division. The details of various faunal species are given as follows:<br><br>***Mammals reported in the Study Area***<br><br>The study site comprises of the carnivore species like Common Leopard (*Panthera pardus*), Jackal (*Canis aureus*), Wild Dog (*Cuon alpinus*), Sloth Bear (*Melursus ursinus*), Indian Fox (*Vulpes bengalensis*), Striped Hyaena (*Hyaena hyaena*), etc. The antelopes are represented by Nilgai (*Boselaphus tragocamelus*), Four-horned Antelope (*Tetracerus quadricornis*), Blackbuck (*Antilope cervicapra*), etc. and Spotted deer (*Axis axis*) and Sambar deer (*Rusa unicolor*) are few deer species reported in the area. Indian Wild Boar (*Sus scrofa*) is also commonly found in the area.<br><br>Other mammalian species commonly found in the area include primates such as Rhesus Monkey (*Macaca mulatta*) and Northern-plain Gray Langur (*Semnopithecus entellus*) and rodents such as Indian Crested Porcupine (*Hystrix indica*), Five-striped Palm Squirrel (*Funambulus pennantii*), Rats & Mouses, etc.<br><br>***Avifauna reported in the Study Area***<br><br>The project area is dominated by the bird species such as Red-vented bulbul (*Pycnonotus cafer*), Brown Rock-chat (*Cercomela fusca*), Asian green bee-eater (*Merops orientalis*), Black Drongo (*Dicrurus macrocercus*), Indian Robin (*Saxicoloides fulicatus*), Black-winged kite (*Elanus caeruleus*), House Sparrow (*Passer domesticus*), Jungle babbler (*Turdoides striata*), Spotted dove (*Spilopelia chinensis*), Laughing dove (*Spilopelia senegalensis*),Indian Rofous Tree pie (*Dendrocitta vagabunda*), Greater coucal (*Centropus sinensis*), Tree Pipit (*Anthus trivialis*), etc. |

<table>
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<td>The species such as Ruddy shelduck (Tadorna ferruginea), Great Egret (Ardea alba), Cattle egret (Bubulcus ibis), Little Egret (Egretta garzetta) Red wattled Lapwing (Vanellus indicus), Common sandpiper (Actitis hypoleucos), Lesser whistling duck (Dendrocygna javanica), etc. are commonly reported near the water bodies.<br><br>Herpetofauna reported in the Study Area<br><br>The most common species reported in the project area are The Bengal Monitor (Varanus bengalensis), Indian Chameleon (Chamaeleo zeylanicus), Indian Rat Snake (Ptyas mucosa), Common Krait (Bungarus caeruleus), Indian Cobra (Naja naja), Russel’s Viper (Daboia russelii), Saw-scaled Viper (Echis carinatus), Indian Sand Boa (Eryx johnii), Indian Star Tortoise (Geochelone elegans), etc.<br><br>For the preparation of the land use/ land cover map of the study area of Chichlik PSP, digital data, The Indian Forest Survey Report (ISFR) data of 2021 has been procured from Forest Survey of India, Dehradun. As per the data, moderately Dense forests cover 16.57%, Open forests constitute 35.81% and Scrubs constitute 1.37% of the total study area. Rest 43.80% is the non-forest area.
<table>
<tr><td>Forest Cover</td><td>Area (%)</td><td>Canopy density</td></tr>
<tr><td>Moderately Dense Forest</td><td>16.57</td><td>Between 40% and 70%</td></tr>
<tr><td>Open Forest</td><td>35.81</td><td>Between 10% and 40%</td></tr>
<tr><td>Scrubs</td><td>1.37%</td><td>Less than 10%</td></tr>
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<td>4</td>
<td>CEA letter confirming project layout is not conflicting with any other planned project in the proposed area.</td>
<td>CEA letter no. CEA-HY-12-23/1/2024-HPA Division, confirmed that the project layout is not conflicting with any other planned project and following is informed:<br><br>“…….it is to inform that, till date, pre-DPR chapters of following projects proposed near Son River in Sonbhadra District, Uttar Pradesh are submitted in CEA<br>1. Kandhaura PSP by M/s JSW Neo Energy</td>
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| | | |
|---|---|---|
| | | *Limited*<br>2. *UP01 PSP by M/s Greenko Energies Private Limited*<br>3. *Shoma PSP by Torrent Power Limited, were submitted in CEA.*<br>*Further, tentative layouts of another two projects namely Sonbahdra PSP and Sashnai PSP are available in CEA. The project closest to Chichlik PSP is Shoma PSP.* |

- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.
- The EAC noted that PP has exercised three more alternatives, in which 2nd alternative has been selected for installation of the said project in which overall land has been reduced from 325.30 ha to 317.60 ha including reduction of forest land from 220.75 Ha to 210.82 Ha. It was informed that proposed lower reservoir in the selected site will be located at 13 m away from HFL of the Sone river.
- The committee's concern about the safety of the proposed lower reservoir, located just 13 meters away from the High Flood Level (HFL) of the Sone River, highlights the need for careful consideration of flood risks. Given the proximity to potential high water levels, there is a justified worry about the structural integrity and operational safety of the reservoir during flood events. The committee suggested that proper mitigation measures should be implemented. These could include reinforcing the reservoir's structure, enhancing drainage systems, and possibly installing flood barriers or diversion systems to manage overflow and protect the reservoir's integrity during high water events. Such precautions are essential to ensure the long-term safety and functionality of the reservoir.
- The proposed site is at 3.92 Km of ESZ boundary from project site, notified vide MOEF&CC notification dated 23rd Sep., 2016 as informed by project proponent and does not fall under Eco Sensitive Zone of Kaimoor Wildlife Sanctuary. The committee suggested to submit the Certificate and certified map from Chief Wildlife Warden that the project area is outside the ESZ boundary.
- It was noted that the head could not be increased by utilizing deeper underground reservoirs for a project based on the longitudinal section (L section) and the specific geography of the site. The explanation highlighted the geological and environmental constraints that limit the depth at which the reservoirs can be feasibly constructed. The PP conveyed that the project design and its capacity have been optimized to maximize efficiency and sustainability within these constraints. Essentially, the dialogue between the EAC and PP focuses on requirement of less forest land, balancing the technical feasibility and environmental impact, ensuring the project is both practical and environmentally sustainable.

**10.1.5** The EAC after deliberations observed that instant project is for grant of grant of Terms of Reference for greenfield Pump Storage Project wherein water is proposed to be extracted from Sone River. The reservoir shall be filled in 2 years for generating envisaged capacity with excess monsoon water only. The Sone river is inter-state, for which Project Proponent is required to obtain

'No Objection Certificate' from the State of Jharkhand and Bihar as there may be genuine concern of downstream consumers. The availability of water in the river shall be submitted by Project Proponent from Central Water Commission and State Water Resources Department.

Further, alternatives sites in the same location proposed by PP, were deliberated in detail by EAC and found that there is no option to avoid forest land coming in the project area and in terms of head/elevation required for the project. However, it was desired that Forest Division of the Ministry and State Government while appraising Forest Clearance, shall take into account the richness of biodiversity and pristine forest area to take appropriate decision.

With regard to layout of the project and submission of clarification by Central Electricity Authority, it was observed that no other project is overlapping with the instant project. The proposed distance of lower reservoir 13 or 15 mtrs from HFL, it was desired that PP shall submit the proposal of EAC and seek approval of CEA/CWC for DPR, within a distance of 100 mts from HFL. The data and distance of HFL shall be certified by concerned State Government and shall be submitting grant submitting the proposal of grant of EC.

Based on the information submitted and as presented during the meeting, EAC **recommended** the proposal for grant of Standard ToR for conducting EIA study with Public consultation (Public Hearing + written submission ) to the project for Chichlik Pumped Storage Hydro Project (1560 MW) in an area of 317.6 Ha located at Village Argarh, Chichli, Khuraila and Pokharriya, Sub District Robertsganj, District Sonbhadra (Uttar Pradesh) by M/s Avaada Waterbattery Private Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional/specific ToR, in addition to the concerns raised in the deliberations:

**(A) Environmental Management and Biodiversity Conservation**

i. Forest Division of the Ministry and State Government while appraising Forest Clearance, shall take into account the richness of biodiversity and pristine forest area to take appropriate decision.
ii. Explore the possibilities for reducing the Forest land requirement. The application for obtaining Stage I FC for 210.82 Ha of forest land involved in the project shall be submitted.
iii. Certificate and certified map from Chief Wildlife Warden shall be submitted mentioning that project boundary is located around 3.92 km from outside the Eco- Sensitive Zone (ESZ) of Kaimoor Wildlife Sanctuary and also project site not falling in any Ecological Sensitive Area, Wildlife Sanctuary/Tiger/elephant corridor/Critically polluted area within 10 km of Project site.
iv. PP shall submit the detail plan for filling the reservoir in 2 years for generating envisaged capacity with excess monsoon water only.
v. No Objection Certificate from State of Jharkhand and Bihar as there may be genuine concern of downstream consumers to avoid scarcity of water to consumers. The availability of water in the river shall be submitted by Project Proponent from Central Water Commission and State Water Resources Department

vi. No transportation of raw materials shall be done through/within the Wildlife Sanctuary prior to the grant of State Government/ Forest Department/Wildlife Department. Accordingly, transportation plan shall be submitted by PP.

vii. 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.

viii. Calculation and values of GHGs ($CO_2$, $CH_4$ etc.) emissions during construction and during operation till the life of the project shall be estimated and submitted.

ix. 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.

x. 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.

xi. Conducting site specific ecological study with respect to riverine ecology focus on 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 Sone River shall be studied.

xii. Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ Sone River /nala of catchment area / due to tapping of water for filling reservoir.

xiii. Action plan for survival or diversion of the rivulets/stream leading to join Sone river shall be submitted.

xiv. Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard 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.

xv. 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.

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

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

xviii. The project area should not come up on any critical mineral zone to be verified by GSI/NMDC.

xix. Any archaeological sites in the vicinity of the project, if any, then it shall be certified by ASI. No mineral zone on the proposed site be certified by Geological Survey of India or any other concerned Government Organization.

**(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 and consultation 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 with allocated fund and timeline to complete within three years of construction of project.

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 shall be acquired as per provisions of Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

v. Budget earmarked for R&R, CSR shall not include in the cost of EMP and compliance of issues raised during Public Hearing.

**(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 PP shall submit the proposal of EAC and seek approval of CEA/CWC for DPR, with a distance of 100 mts from HFL to avoid future damage due to flood. The data and distance of HFL shall be certified by concerned State Government and shall be submitting grant submitting the proposal of grant of EC.

**(E) Miscellaneous**

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

ii Pre-DPR Chapters viz., Hydrology, 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 submit.

v 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.

vi Detailed plan to restore wider roads and convert them into narrow upto 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 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.

ix Detailed report on cumulative effect of multiple projects already proposed within the region on the same river.

**Agenda No. 10.2**

**Shirawta Off Stream Open Loop Pumped Storage Project (1800 MW) in an area of 197.9 ha (change in land use with increase in forest area from 60.10 ha to 160.783 ha) at Village Khandshi, Tehsil Maval, District Pune, Maharashtra by M/s The Tata Power Company Limited – For Amendment in Terms of References (TOR) – reg.**

**[Proposal No. IA/MH/RIV/462841/2024; F. No. J-12011/38/2023-IA.I (R)]**

**10.2.1** The proposal is for amendment in Terms of References (ToR) to the project for Shirawta Off Stream Open Loop Pumped Storage Project (1800 MW) in an area of 197.9 ha (change in land use with increase in forest area from 60.10 ha to 160.783 ha) at Village Khandshi, Tehsil Maval, District Pune, Maharashtra by M/s The Tata Power Company Limited.

**10.2.2** 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:

- The proposed Shirawta Pumped Storage Project (Shirawta PSP) is an Open Loop PSP scheme with an installed capacity of 1800 MW (5 x 300 MW + 2 x 150 MW) with existing lower Shirawta reservoir located at village Khandshi, Tal Maval, Dist. Pune which is owned and operated by Tata Power and new proposed upper reservoir situated in same village in land owned by Tata Power Co Ltd.

- The project area is in the Sahyadri ranges of the Western Ghats of Maharashtra State in the area bordering Pune and Raigad districts. Shirawta PSP has been designed to meet the peaking requirement daily in the southern region grid and the state of Maharashtra for a duration of about six (6) hours.
- It is proposed to utilize the head available between existing Shirawta lower dam and upper dam proposed in forest land. Lower Shirawta reservoir located at village Khandshi, Tal Maval, Dist. Pune of Maharashtra state having a geographical latitude 18°48'24.47"N and longitude 73°28'46.62"E. The upper dam is proposed to be located on forest land up-the-hill table plot having a geographical latitude 18°50'22.15"N and longitude 73°27'5.12"E.

**10.2.3** The EAC during deliberations noted the following:

- PP submitted an application for amendment in ToR granted by the Ministry vide letter dated 23.09.2023 to said project.
- For diversion of forest land, online application was submitted to MoEF&CC vide proposal No.: FP/MH/HYD/IRRIG/453299/2023 dated 27.11.2023. The Project envisages utilization of about 197.81 Ha for various project component including inter alia upper reservoir, lower reservoir, penstocks, powerhouse, approach road, dump yard etc. Of 197.81 Ha, 137.71 Ha was earlier proposed to be private land and 60.10 Ha was 'reserve forest' land. Therefore, Tata Power had submitted an application through Parivesh portal for diversion of 60.10 Ha of land for the proposed Project.
- PSC I was held on 11.12.2023 wherein DCF Pune office raised a query towards the nature of the land in erstwhile village Torne (roughly admeasuring about 101 Ha) and submitted that as per the forest records, the status is 'reserved forest'. Proposal was in principally accepted with a condition that DCF Pune shall verify the area statement of proposed project.
- The 'Title' and 'Legal Ownership' of the land (as per the prevailing revenue records for past 100 years till date) shows Tata Power's name. Reference directions by PSC-1, area statement and other details were verified by DCF Office and it was instructed to Tata Power to include this land parcel as well, in the application. Therefore, the total forest land gets revised from 60.10 Ha to 160.783 Ha and the non-forest land gets revised from 137.80 Ha to 37.014 Ha.
- No project component falls in any notified protected area. Nearest Protected Area to the Project Components is Bhimashankar Wildlife Sanctuary and Sudhagad Wildlife Sanctuary. Also, all the project components are well outside the notified EcoSensitive Zone (ESZ) of Bhimashankar Wildlife Sanctuary and Sudhagad Wildlife Sanctuary.
- Amendment sought by the PP is as follows:

| **Description** | **Reference** | **Existing** | **Proposed / Amendment** | **Reason** |
|---|---|---|---|---|
| Approved ToR | Subject | Shirawta Off Stream Open Loop Pumped Storage Project (1800 | Shirawta Off Stream Open Loop Pumped Storage Project (1800 MW) in an area of 197.9 | The land has been optimized during detailed project design. |

| | | | | |
|---|---|---|---|---|
| | | MW) in an area of 197.9 ha | ha (change in land use with increase in forest area from 60.10 ha to 160.783 ha) | |
| Land Requirement | Para 1 and Para 7 | 197.9 ha | 197.797 ha | The land has been optimized during detailed project design. |
| Land Requirement | Annexure 3 Para (i) | 197.9 ha | 197.797 ha | The land has been optimized during detailed project design. |
| Project/Activity Cost | Annexure 3 Para (iii) | Rs 7027.72 crore | Rs 7285.0 crore | The revision in the project cost is towards the changes in the technical specifications and towards revision in area of forest land and non-forest land. |
| Land Requirement | Annexure 3 Para (v) | Out of 197.9 ha of total land requirement, 60.1 ha is forest land and 137.8 ha is non-forest land of which 135.6 ha belongs to Tata Power. | Out of 197.797 ha of total land requirement, 160.783 ha is forest land and 37.014 ha is non-forest land which belongs to Tata Power. | During PSC-1 meeting DCF Pune submitted that the 'nature of the land' (admeasuring about 97.05 Ha) is 'reserved forest' as per the forest records and the 'nature of the land' (admeasuring 3.62 Ha) is 'private forest' as per the forest records. |
| Length of Penstock | Annexure 3 Para (xii) 3. | 1026.41 m | 1126.06 m | To avoid the negative pressures & bends in water conductor system, penstock alignment changed slightly (no changes in alignment in plan) & hence length of water conductor system increased slightly. |

| | | | | |
|---|---|---|---|---|
| Rated Head | Annexure 3 Para (viii) | gross head of about 301.03 m available at project site. | rated head of about 301.13 m available at project site. | Rated head changed slightly as size of water conductor system changed during preparation of detailed design report |
| Live Storage Capacity | Annexure 3 Para (xii) 1. | 15.33 MCM (0.54 TMC) | 15.15 MCM (0.53 TMC) | During preparation of Detailed project report with updated survey data, area capacity curve has been updated & found slight changes in live storage. |
| Length of embankment dam | Annexure 3 Para (xii) 1. | 4732.77 m | 4440.75 m | During design stage, type of the dam has been changed from Asphalt face rockfill dam to Geomembrane faced rockfill dam. |
| Tail Race Tunnel | Annexure 3 Para (xii) 8. | 8 Numbers of circular shaped Tail race tunnel having length of about 145.65 m. | 6 Numbers of circular shaped Tail race tunnel having length of about 156.93 m. | Considering the hydraulic short circuit requirement, 6 nos. tailrace tunnels have been proposed. |
| Diversion arrangement | Annexure 3 Para (xii) 10. | A diversion arrangement at the lower reservoir (existing Shirawta reservoir) for the construction of lower intake and for the connection of TRT to existing Shirawta reservoir | No diversion arrangement will be required for the construction of lower intake. A coffer dam will be planned to isolate the area for the construction of lower intake. | Coffer dam will be constructed to isolate the area. |

| | | | | |
|---|---|---|---|---|
| Dimensions of Surface Powerhouse | Annexure 3 Para (xii) 4. | 251.0 m (L) x 28.0 m (W) x 70.0 m (H) | 255.0 m (L) x 28.0 m (W) x 70.1 m (H) | Slight change in length of powerhouse during DPR preparation as more information & design for electromechanical components is available. |
| Dimensions of tail race tunnels | Annexure 3 Para (xii) 9. | Out of 7 tunnels, 5 tunnels are having diameter of 6.40 m & two tunnels are 4.50 m diameter. | Out of 7 tunnels, 5 tunnels are having diameter of 5.50 m & two tunnels are 3.90 m diameter. | In earlier proposal, tailrace tunnels were concrete lined & during detailed design it is found that steel lined tunnel will be technically more suitable & based on economical diameter consideration, diameter of tunnel has been changed. |
| Design Discharge | Annexure 3 Para (ix) | 676.51 cumec | 672.9 cumec | Design discharge changed slightly as size of water conductor system changed during preparation of detailed design report |

- The Ministry vide letter dated 23.09.2023 granted Terms of Reference with the condition that the EAC shall conduct site visit before considering the proposal for grant Environmental Clearance. Accordingly, based on request received from M/s Tata Power Ltd, the EAC sub-committee conducted site visit on 23.02.2024 by the following members:
  a. Shri Ajay Kumar Lal, Chairman
  b. Dr J V Tyagi, Member
  c. Shri Kartik Sapre, Member
  d. Dr Saurabh Upadhyay, Member
- The EAC deliberated on the information submitted (Form 1, PFR, kml file, etc.) and as presented in the meeting.
- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.

**10.2.4** The EAC after detailed deliberation observed the increase in forest land from 60.1 ha to 160.783 ha due to change in nature of ownership of the land. Earlier, PP thought that the said land is owned by them and considered as non-forest land, however while submitting the proposal of forest clearance, it was found that the said land is reserved forest for which forest clearance has to be obtained by PP. Accordingly, there is change in area of forest land from non-forest area, with very slight changed in total area of the project i.e. from 197.9 ha to 197.797. Further, various

other amendments in ToR such as Length of Penstock, Rated Head, Live Storage Capacity, Length of embankment dam, Tail Race Tunnel, Diversion arrangement, Dimensions of Surface Powerhouse, Dimensions of tail race tunnels and Design Discharge were observed based on data collected for preparation of Detailed Project Report (DPR). Also, it was desired that the recommendations of the sub-committee of EAC that has visited the site on 23.02.2024, shall be followed by the project proponent before submission of EC application by the project proponent.

It was further observed that instant project lies in Western Ghats of Maharashtra state for which Ministry has issued Draft Notification of Eco-Sensitive Area dated 6th July, 2022. From this, it can be observed that New Hydropower projects and its activities are under regulated areas and shall be allowed as per the Environment Impact Assessment notification, published vide number S.O. 1533 (E), dated the 14th September, 2006 with certain terms and conditions mentions therein.

Based on the information submitted and as presented **recommended** the proposal for grant of amendment in Terms of References (ToR) dated 23.09.2023 as proposed by the PP to the project for Shirawta Off Stream Open Loop Pumped Storage Project (1800 MW) in an area of 197.9 ha (change in land use with increase in forest area from 60.10 ha to 160.783 ha) at Village Khandshi, Tehsil Maval, District Pune, Maharashtra by M/s The Tata Power Company Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional ToR:

i. PP shall explore the possibility to minimize the forest area involved in the project and possibility to transplant the trees in consultation with state forest department.
ii. Project Proponent shall undertake a survey to count the number of trees present in the proposed upper reservoir site.
iii. The PP should take necessary permission from the concerned authorities before felling of trees and shall take compensatory plantation activities if applicable.
iv. Owing to the hilly terrain and steep slopes, committee is of the opinion that project proponent may undertake land subsidence studies through a qualified geologist and report to submit to the Ministry and IRO.
v. Duly approved plan for conservation of Schedule-I species shall be submitted.
vi. Explore the possibility to construct approach road and muck disposal area on non-forest land.
vii. Study shall be carried out on impact on fishes.
viii. Conservation of Indigenous Fishes and aquatic flora fauna in existing Upper Reservoir area. Also, promoting livelihood activities vis-à-vis cage culture, etc.
ix. Submit proof that the reservoir belongs to the project proponent and approval of water allocation.
x. The dam is an old structure the subcommittee suggested to assess the dam stability and risk assessment.
xi. Secondary data of presence/occurrence of wildlife in the in consultation in forest department and local people shall be provided.
xii. PP shall conduct mapping of the various wildlife sanctuaries such as Bhimasankar. Sudhagad, Phansod etc. and of other wildlife corridor present (if any) in the project and buffer area of the project and submit the detail plan of its mitigation.
xiii. All other conditions mentioned in ToR dated 23.09.2023 shall remain unchanged.

**Agenda No. 10.3**

**Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW in an area of 1100 Ha located in Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited – For Terms of Reference - reg.**

**[Proposal No.: IA/AR/RIV/466561/2024; F. No. J-12011/40/2009-IA-I(R)]**

**10.3.1** The proposal is for grant of Terms of Reference to the project Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW in an area of 1100 Ha located in Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited.

**10.3.2** The Project Proponent along with consultant M/s WAPCOS, made a detailed presentation on the salient features of the project and informed that:

i. M/s THDC India Limited proposes to construct Kalai-II Hydro-Electric Project (HEP) with a capacity of 1200 MW in Anjaw district, Arunachal Pradesh. The Kalai-II H.E. Project envisages Run of the River with pondage scheme on the Lohit river, a left bank tributary of Brahmaputra river with a view to utilize flows of Lohit river over large head available for hydro power generation.

ii. The project aims to harness the abundant water resources of the Lohit River, with a gross head of approximately 125m positioned strategically upstream of Hutong-II HEP and downstream of Kalai-I HEP on the same river. The project is located in the vicinity of the Chingwanti bridge near Hawai Town.

iii. The Kalai-II HE Project envisages utilization of a gross head of about 125m for power generation with an installed capacity of 1200MW. The coordinates of Kalai-II HE Project are Latitude 27o 54’ 20” N and Longitude 96o 48’ 16” E. The full reservoir level (FRL) is at EL 904.80m.

iv. The project involves construction of a concrete gravity dam, upstream & downstream coffer dam, diversion tunnel, intake tunnel, pressure Shafts, underground Powerhouse complex, surge chamber and Tail Race Tunnel etc. The total optimized land requirement for the project including underground structures is 1100 Ha.

v. **Background**: The Project was initially allotted to Kalai Power Private Limited (KPPL) (a subsidiary of Reliance Power Limited). The Terms of Reference (ToR) was accorded by MoEF&CC to Kalai Power Private Ltd. vide letter 09.12.2009 for a period of 04 years, which was further extended for 01 year vide letter dtd. 05.02.2014. Further, for grant of Environment Clearance (EC), MoEF&CC vide letter dtd. 20.05.2015 informed that EC for Kalai-II HEP has been approved by the competent authority and shall be issued on producing Stage-1 Forest Clearance (FC). The baseline data for 03 seasons has already been collected earlier as per ToR.

vi. There is no change in the scope of the Project and other site conditions which are consistent with earlier approved DPR. The process of Public Consultation in accordance to EIA Notification 2006 was also completed in 2014 by the previous Project developer. However, the previous developer did not pursue the case of FC further due to which the Project could

not take off and EC could not be issued in absence of Stage-1 FC. Consequently, EC could not be transferred in the name of THDCIL from previous developer as it was only approved but not issued by MoEF&CC.

vii. Project Cost: The estimated project cost is Rs 12801.54 Cr (Submitted to CEA for approval & is under review). The total capital cost earmarked towards environmental pollution control measures is Rs 19.473 Cr and the Recurring cost (operation and maintenance) will be about Rs 0.187 Cr per annum; as per approved EIA/EMP-2014.

viii. Project Benefit: Total Employment will be 100 persons as direct & 1000 persons indirect. Industry proposes to allocate Rs 32.011 Crore @ of 0.25% of project cost towards CER (as per Ministry's OM dated 01.05.2018).

ix. Environmental Sensitive area: There are No national parks, wildlife sanctuaries, Biosphere Reserves, Tiger/Elephant Reserves, Wildlife Corridors etc. within 10 km distance from the project site. The project is proposed on the Lohit River.

x. MoU / any other clearance/ permission signed with State government: THDCIL has signed a Memorandum of Agreement (MoA) with Govt. of Arunachal Pradesh on 30.12.2023 for the execution of 1200 MW Kalai-II Hydroelectric Project located in Anjaw District of Arunachal Pradesh.

xi. Resettlement and rehabilitation**:** The R&R Plan shall be prepared as per the norms of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013.

xii. Alternative Studies:

| S.No | Description | Alternative- Site-I | Alternative-Site-II |
|---|---|---|---|
| 1 | Location | Located approximately 3.7 km d/s of Chingwanti Bridge.<br>Latitude (N): 27˚ 54' 20"<br>Longitude (E): 96˚ 48' 16" | Located approximately 2.0 km km d/s of Chingwanti Bridge<br>Latitude (N): 27° 53' 34.09" N<br>Longitude (E) : 96° 48' 47.65" E |
| 2 | Dam | Height – 198m above deepest foundation<br>Width – 272 m<br>Left Abutment Occupied by Overburden – 70 m approx.<br>Excavation Volume – 35 Lakh Cum<br>Concrete Volume – 21.49 lakh Cum | Height – 188m above deepest foundation<br>Width – 398 m<br>Both Abutment occupied by overburden – 32 to 50 m approx.<br>Excavation Volume – 38.6 Lakh Cum<br>Concrete Volume – 23.40 lakh Cum |
| 3 | Power House | Underground<br>Located in fair to good quality of rock-mass. | Possibility of encountering Sheared and shattered rock-mass based on sheared rock encountered in borehole. |
| 4 | Tail Race Tunnel | The length of TRT would be short. | The length of TRT would be very long (additional 6.3 kms) |
| 5 | Reservoir Gross | 318.88 MCM | 259.50 |

| | | | |
|---|---|---|---|
| | Volume | Larger Retention Volume for Sediment | Lesser Retention Volume |
| 6 | Cost | The cost of alternative at Site-II was estimated to be higher than Alternative at Site-I by a margin of about 12%. | |
| Conclusion | | In view of lower overall estimated project development cost and the geotechnical observations, Alternative Site – I was selected as the Dam Axis for the project. | |

xiii. The Salient features of the project are as follows:

- Project details:

| | |
|---|---|
| Name of the Proposal | Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW located in Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited |
| Location (Including coordinates) | Anjaw District, Arunachal Pradesh Lat: $27^0$54' 20" Long $96^0$48'16" |
| Inter- state issue involved | No |
| Seismic zone | Zone V |

- Category details:

| | |
|---|---|
| Category of the project | 1 (c) |
| Provisions | As per Schedule of EIA Notification 2006 |
| Capacity / Cultural Command Area (CCA) | 1200 MW |
| Attracts the General Conditions (Yes/No) | No |
| Additional information (if any) | NIL |

- Electricity generation capacity:

| | |
|---|---|
| Powerhouse Installed Capacity | 1200 MW |
| Generation of Electricity Annually | 4852.95 GWh |
| No. of Units | 6*190 MW + 1*60 MW (07 units) |
| Additional information (if any) | No |

- ToR/EC Details:

| | |
|---|---|
| Cost of project | 12801.54 Cr (Submitted to CEA for approval) |
| Total area of Project | 1100 Ha |
| Height of Dam from River Bed (EL) | 128.5 m |
| Length of Tunnel/Channel | The total length of five Nos of 7.5 m dia HRTs is 534.7 m and for 8.5 m dia HRT is 63.3 m .<br><br>Total length of 3 nos. TRT is 3939 m plus Length of 01 Auxiliary TRT is 333 m. |

| | |
|---|---|
| Details of the Submergence area | 638.456 Ha |
| Types of Waste and quantity of generation during construction/ Operation | Domestic Solid Waste, Hazardous Waste, and Muck. |
| E-Flows for the Project | As per the table given below. |
| Is Projects earlier studies in Cumulative Impact assessment & Carrying Capacity studies (CIA&CC) for River in which project located. If yes, then | Yes, Cumulative Impact assessment and carrying capacity study of Lohit Basin, 2016. |
| a) E-flow with TOR /Recommendation by EAC as per CIA&CC study of River Basin.<br><br>b) If not the E-Flows maintain criteria for sustaining river ecosystem. | a) Listed As per the table given below. |

| **E-Flow as per** | **% and EF in (Cumecs)** | | | |
|---|---|---|---|---|
| **Cumulative Impact assessment and carrying capacity study of Lohit Basin** | **June-Sept (Monsoon)** | **April-May (Non Monsoon Non Lean)** | **Oct-Nov (Non Monsoon Non Lean)** | **Dec-March (Lean)** |
| | 20%<br>163.48 | 21%<br>118.9 | 21%<br>81.97 | 15%<br>42.09 |

- Muck Management Details:

| | |
|---|---|
| No. of proposed disposal area/(type of land-Forest/Pvt. land) | 05 sites, Forest land |
| Muck Management Plan | Shall be covered as apart of EIA Study |
| Monitoring mechanism for Muck Disposal | Shall be covered as apart of EIA Study |

- Land Area Breakup

| | |
|---|---|
| Private land | Nil |
| Government land/Forest Land | 963.764 Forest Land |
| Submergence area/Reservoir area | 638.456 ha |
| Land required for project components | 1100 Ha |
| Additional information (if any) | A proposal for 963.764 Ha of forest land has been submitted and is under process of approval.<br>Additional 136.236 ha of land in the under-identification stage for base camp township, store, office, weigh bridge, EM & HM store, cement & steel stockyard.<br>The remaining land shall be acquired as per |

| | |
|---|---|
| | prevailing norms for Pvt land, Govt land or Forest land, as applicable. |

- 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 (RF)<br><br>Protected Forest Land | 295.986 Ha R.F.<br>Nil | Application for Stage-I FC was submitted on 23.01.2024 for 295.986 ha of reserve forest along with 667.778 ha of unclassed Forest. |
| National Park | Nil | |
| Wildlife Sanctuary | Nil | |

- Court Case Details

| | |
|---|---|
| Court Case | NIL |
| Additional information (if any) | |

- Affidavit/ Undertaking Details

| | |
|---|---|
| Affidavit/Undertaking | Attached |
| Additional information (if any) | |

- Previous EC compliance and necessary approvals

| **Particulars** | **Letter no. and date** |
|---|---|
| Certified EC compliance report (if applicable) | NA |
| Status of Stage- I FC | Proposal No FP/AR/HYD/IRRIG/459593/2024 was submitted on 23.01.2024. |
| Additional detail (If any) | The Project was initially allotted to Kalai Power Private Limited (a subsidiary of Reliance Power Limited).<br><br>EAC recommended the issuance of EC vide its 81st meeting held on 28.01.2015 based on the EIA/EMP study and PH conducted 2014.<br><br>After that MoEF&CC vide its letter No. J-12011/40/2009-IA.I dtd 20.05.2015 conveyed that Environment Clearance (EC) for Kalai-II HEP has been approved by the competent authority and EC letter shall be issued on production of Stage-1 Forest Clearance (FC).<br><br>The proposal case for seeking Stage-1 Forest Clearance was initiated in February 2013 and the same could not take off.<br><br>Meanwhile, THDCIL has entered into a Memorandum of Agreement (MoA), executed between the Hon'ble Governor of |

| | |
|---|---|
| | Arunachal Pradesh and THDC India Ltd on dtd 30.12.2023 for the execution of 1200 MW Kalai-II Hydroelectric Project.<br><br>A fresh application for Forest Clearance has been submitted on 23.01.2024.<br>Since EC was approved only, and was not issued, hence, the same could not be transferred in the name of THDCIL.<br><br>Accordingly, the present proposal for the issuance of ToR has been submitted on 23.03.2024. |
| **Is FRA (2006) done for FC-I** | FRA certificate issued vide Letter dated 14.11.2014 and 22.02.2024. |

- Miscellaneous

| **Particulars** | **Details** |
|---|---|
| Details of consultant | M/s WAPCOS Limited |
| Project Benefits | ➢ Capacity addition of 1200 MW in the North-East Region, meeting power-requirement of the region.<br>➢ Annual Energy Generation of ~ 4852.95 GWh of electricity<br>➢ Integrated Development of the region in the areas of employment, communication, education, health, tourism,<br>➢ 12% free power will be provided to the home state of Arunachal Pradesh.<br>➢ In addition, 1% power/revenue shall be utilized for contribution towards local area development. |
| Status of other statutory clearances | Environment Clearance: Applied<br>Forest Clearance: Applied<br>Wildlife Clearance: Not Applicable |
| R&R details | Shall be covered as apart of EIA Study |
| Additional detail (If any) | Nil |

**10.3.3** 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 Terms of Reference (ToR) for conducting EIA study of the project for setting up of Kalai II Hydro Electric Project (Run-of-the-River) of 1200 MW in an area of 1100 Ha located in Tehsil Hawai Town, District Anjaw, Arunachal Pradesh by M/s THDC India Limited.
- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.
- Ministry has granted TOR vide letter dated 09.12.2009 to Kalai Power Private Limited (KPPL) (a subsidiary of Reliance Power Limited) for a period of 04 years, which was further extended for 01 year vide letter dtd. 05.02.2014. In 2015, EC for Kalai-II HEP has been approved by the competent authority and shall be issued on producing Stage-1 Forest

Clearance (FC). The case of grant of FC was not followed due to which EC could not be issued in absence of Stage-1 FC.

- The Committee expressed dissatisfaction that KPPL after undertaking the project and elapsing 5 precious years abandoned it without giving any reason, and the data thus generated was not also shared with the present proponent. Hence, it is important that a certificate from the present proposer be taken indicating expertise availability and a commitment to completion, if the project gets through for implementation. The present PP THDCIL submitted an unsigned (with initials only and without any other details and official seal) executive summary document. The EAC added that a signed document would typically indicate official endorsement, accountability, and commitment to the contents presented. It is also made clear why a more environment friendly PSP was not proposed by THDCIL instead of a dam-reservoir hydropower project (R-o-R) after KPPL abandoned it mid-way.
- The EAC reviewed on the water availability data for the River Lohit submitted by the PP from 2002-03. The committee expressed dissatisfaction because the PP had completed the entire Environmental Impact Assessment (EIA) study a decade ago and is still designing the project based on water availability data from 20 years ago. PP has further informed to the committee that they have requested CWC to provide committee latest data on the water availability in the region.
- The committee's emphasis on sediment transportation from the upper reaches and the large catchment area of the Lohit River underscores a critical aspect affecting the feasibility and sustainability of the project. Further, deliberated that sediment transport can indeed have substantial implications for the design, operation, and maintenance of hydroelectric projects, particularly in terms of reservoir siltation and sediment deposition. The committee's concern over the viability of the project reflects legitimate worries about the long-term effectiveness and economic sustainability given these challenges. Addressing sediment transport issues would likely require comprehensive sediment management strategies, such as upstream erosion control measures, sediment trapping techniques, or periodic dredging activities.
- The EAC observed that the PP stated in the Form 1 submission on Parivesh that there were no violations associated with the proposed project. However, when the PP submitted the undertaking to the Ministry for consideration of the proposal, no specific details were provided regarding the same.

**10.3.4** The EAC after detailed deliberation observed that instant project of ToR for Hydroelectric projects lacks detailed data analysis already available with PP in a way of approved DPR and earlier EIA report. The PP shall present the available data with respect to hydrology/available water resources, sediment load, submergence area required for sediment to settle, silt load etc. for redesigning or changes (if required) instead of following earlier approved details. The committee's concern over the viability of the project reflects legitimate worries about the long-term effectiveness and economic sustainability given these challenges. It was also desired that PP shall consider the alternative of implementing Pump Storage Project (PSP) instead of conventional Hydroelectric project. If PSP is not feasible then technical details and reason has to be submitted.

In view of above and the information submitted and as presented, EAC has desired additional

information on following observation for further consideration of the project:

i. Latest Water availability data shall be obtained CWC and hydro-graph of annual discharge based on historical data. E-flow based on hydrology and aquatic biology sustenance be re-calculated based on latest data and in variable climate conditions.
ii. PP shall explore the possibility of implementing PSP instead of conventional Hydroelectric project and if PSP is not feasible then technical details and reason has to be submitted
iii. Detailed study and assessment shall be carried to evaluate the potential effects of sediment transport on the proposed project.
iv. All international boundary related clearances including clearance from Ministry of Defence shall be obtained from the concerned authorities and be submitted with supporting documents
v. An affidavit shall be submitted stating that there is no construction done at the site and no violation of EP Act (1986), Water Act (1974), Air Act (1981), Forest Act (1980) and wild life protection act (1972) has been done.
vi. Letter from DFO shall be obtained stating that project does not fall under any wildlife corridor.
vii. PP shall resubmit the proposal with revised layout of muck disposal site outside the forest area and overall minimizing the forest land for the proposed project.
viii. To submit the current status of 136.236 ha land which is under identification stage and to submit the status along with details of previous FC clearance proposal submitted to Ministry in 2014-2015.
ix. Secondary data of presence/occurrence of wildlife in consultation of forest department and local people shall be provided.
x. The PP shall submit NOC from previous owner in respect to the change in ownership of the said project.

The project was ***deferred*** on above lines.

**Agenda No. 10.4**

**Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW (change in capacity and land area) at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited - Amendment in Terms of Reference - reg.**

**[Proposal No.IA/MH/RIV/461164/2024 ; F. No. J-12011/21/2022-IA.I (R)]**

**10.4.1** The proposal is for amendment in Terms of Reference to the project Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited.

**10.4.2** 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. Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW at village Adoshi 8- Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra).

ii. The Upper reservoir (new) is proposed on hilltop across seasonal minor rivulet/ nallah draining into kukadi river and lower reservoir (new) proposed across seasonal minor rivulet/ nallah draining into Kalu river. The proposed Malshej Ghat Bhorande is planned an Off-Stream Closed Loop Pumped Storage Scheme. The live storage of upper reservoir is 7.04 and lower reservoir is 8.15 MCM.

iii. The proposal is for amendment in the Terms of Reference granted by the Ministry vide letter dated 24/03/2023 for the project Malshej Ghat Bhorande Pumped Storage Project of capacity 1440 MW at village Adoshi 8- Bhorande, Tehsil Junnar & Murbad, District Pune 8 Thane (Maharashtra) by M/s Adani Green Energy Limited.

iv. The project proponent has requested for amendment in the ToR with the details are as under:

| S. No | Para of ToR issued | Details as per the ToR | To be revised/ read as | Justification/ reasons |
|---|---|---|---|---|
| 1. | Subject | Malshej Ghat Bhorande Pumped Storage Project of capacity 1440 MW at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited. | Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited. | The increase in project capacity from 1440MW (6 X 240) to 1500MW (4x300 + 2x150) is for maintaining standard unit size of 300 MW and for obtaining operational flexibility. |
| 2. | Para 2 | The Ministry of Environment, Forest and Climate Change has considered the application. It is noted that the proposal is for grant of ToR to the project for Malshej Ghat Bhorande Pumped Storage Project of capacity 1440 MW in an area of 116.5 ha at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited. | The Ministry of Environment, Forest and Climate Change has considered the application. It is noted that the proposal is for grant of ToR to the project for Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW in an area of 166.26 ha at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane | The land area has increased (116.5ha to 166.26ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based on detailed survey & investigations, whereas earlier land details were based on the Preliminary feasibility. |

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|---|---|---|---|---|
| | | | (Maharashtra) by M/s Adani Green Energy Limited. | |
| 3. | Para 5 (i) | The proposal is for grant of terms of reference to the project for Malshej Ghat Bhorande Pumped Storage Project of capacity 1440 MW in an area of 116.5 ha at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited. | The proposal is for grant of terms of reference to the project for Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW in an area of 166.26 ha at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited. | The increase in project capacity from 1440MW (6 X 240) to 1500MW (4x300 + 2x150) is due to for maintaining standard unit size of 300 MW and for obtaining operational flexibility.<br>The land area has increased (116.5ha to 166.26ha) under which majorly reservoir area, water pipeline, WCS & approach road has been increased based on detailed survey & investigations, whereas earlier land details were based on the Preliminary feasibility. |
| 4. | Para 5 (ii) | Malshej Ghat Bhorande is an Off-Stream Closed Loop Pumped Storage Scheme with an installed capacity of 1440 MW (6 x 240 MW). The Upper reservoir (new) is proposed on hilltop across seasonal minor rivulet/ nallah draining into kukadi river and lower reservoir (new) proposed across seasonal minor rivulet/ nallah draining into Kalu | Malshej Ghat Bhorande is an Off-Stream Closed Loop Pumped Storage Scheme with an installed capacity of 1500 MW (4x300 + 2x150). The Upper reservoir (new) is proposed on hilltop across seasonal minor rivulet/ nallah draining into kukadi river and lower | The optimization in quantum of water required for initial/one time filling of reservoirs from 11.2 MCM to 9.88 MCM is as per detailed study during the DPR stage,<br>Earlier it was proposed to use the Manikdoh reservoir which is |

| | | | | |
|---|---|---|---|---|
| | | river. The quantum of water required for initial/ one time filling of reservoirs (i.e. 11.2 MCM) shall be pumped from existing reservoir of Manikdoh dam during monsoon months. Malshej Ghat Bhorande PSP has been designed to meet the peeking requirement daily in the southern region grid and state of Maharashtra for the duration of about six (6) hours. | reservoir (new) proposed across seasonal minor rivulet/ nallah draining into Kalu river. The quantum of water required for initial/one time filling of reservoirs (i.e. 9.88 MCM) shall be pumped from nearby Kalu River. Malshej Ghat Bhorande PSP has been designed to meet the peeking requirement daily in the southern region grid and state of Maharashtra for the duration of about six (6) hours. | part of krishna basin. Therefore, it is now proposed to pump from Kalu river to Lower reservoir to avoid ISM. |
| 5. | Para 5 (iii) | The upper dam is proposed on a tabletop hill near Adoshi village in Junnar Taluka, Pune district of Maharashtra state having a geographical latitude 19° 17' 59.3" N and longitude 73° 41' 27.7" E. The lower dam is proposed near Bhorande village in Murbad Taluka, Thane district of Maharashtra State with the geographical latitude 19° 18' 43.1" N and longitude 73° 40' 30" E. The project area lies in the Sahyadri Ranges of Western Ghats in the State of Maharashtra in the area bordering Pune and Thane districts. | The upper dam is proposed on a tabletop hill near Adoshi village in Junnar Taluka, Pune district of Maharashtra state having a geographical latitude 19° 17' 59.3" N and longitude 73° 41' 27.7" E. The lower dam is proposed near Bhorande village in Murbad Taluka, Thane district of Maharashtra State with the geographical latitude 19° 18' 43.1" N and longitude 73° 40' 30" E. The project area lies in the Sahyadri Ranges of Western Ghats in the State of Maharashtra in the area bordering | No Change |

| | | | | |
|---|---|---|---|---|
| | | | Pune and Thane districts. | |
| 6 | Para 5 (iv) | The proposed Malshej Ghat Bhorande PSP (6 x 240 MW) envisages following major civil structures:-<br>a. Upper Dam (RCC Dam): Crest length 1990 m, maximum height 37 m above the deepest riverbed level. Gross storage capacity of Upper reservoir is 8.8 Mm3.<br>b. Lower Dam (RCC Dam): Crest length 870 m, maximum height 67 m above the deepest riverbed level. Gross storage capacity of Lower reservoir is 9.6 Mm3.<br>c. Upper Intake/ Outlet: Horizontal pit type intake, 4 nos. of trash rack bays, each unit with a size of 7.25 m (W) x 15.0 m (H).<br>d. Lower Intake/ Outlet: Horizontal pit type intake, 4 nos. of trash rack bays, each with a size of 6.5 m (W) x 15.0 m (H).<br>e. Pressure Shaft: 1660 m (length), 8.5 m (diameter), Circular shaped, steel lined and branching near powerhouse<br>f. Surface Powerhouse: 180 m (L) x 23 m (W) x 45 m (H) | The proposed Malshej Ghat Bhorande PSP (4 x 300 + 2 x 150) envisages following major civil structures:-<br>Upper Dam (RCC Dam): Crest length 1967 m, maximum height 30.5 m above the deepest riverbed level. Gross storage capacity of Upper reservoir is 7.95 Mm3.<br>b. Lower Dam (RCC Dam): Crest length 712 m, maximum height 64.5 m above the deepest riverbed level. Gross storage capacity of Lower reservoir is 8.97 Mm3.<br>Upper Intake/ Outlet: Horizontal pit type intake, 5 nos. of trash rack bays, each unit with a size of 5.2 m (W) x 4.2 m (H).<br>Lower Intake/ Outlet: Horizontal pit type intake, 3 nos. of trash rack bays, with a size of 7.1m (W) x 6.2m (H) (Large) and 5m(W) x 5m (H) (Small)<br>Pressure Shaft: 1134 m (length), 3.7 m (diameter), Circular shaped, steel lined and branching near powerhouse.<br>Underground Powerhouse: 217 m (L) x 22 m (W) x 50 m (H). | The changes are as per the technical evaluation done by the various directorates of CEA, CWC, GSI for approval of DPR. |

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|---|---|---|---|---|
| | | g. Tailrace Tunnel: 65 m (length), 8.5 m (diameter), horseshoe shaped, concrete lined.<br>h. Approach Road<br>➢ Strengthening of existing roads – 3 km<br>➢ Construction of new road – 4 km<br>Adit to bottom of pressure shaft - 620 m (length) x 7.6 m (width) x 8.5 m (height), D-shaped, unlined. | Tailrace Tunnel: 3 nos. of tunnel, 582 m (length), 6.0m (2 no) & 5.0m (1 no).<br>Approach Road<br>Strengthening of existing roads – 3 km<br>Construction of new road – 4 km<br>Adit tunnel<br>*Mat (Size & Type)- 1320m (L) x 8.0m Dia. D-shaped*<br>ADIT-1 (Size & Type)- 685m (L) x 7.5m Dia. D-shaped;<br>*ADIT-2 (Size & Type)- 465m (L) x 6.5m Dia. D-shaped*<br>*ADIT-3 (Size & Type)- 495m (L) x 7.5m Dia. D-shaped*<br>*Escape-1 (Size & Type)- 465m (L) x 6.5m Dia. D-shaped*;<br>*Escape-2 (Size & Type)- 200m (L) x 6.5m Dia. D-shaped* | |
| 7. | Para 5 (v) | Land requirement: The total land required for the project components and related works has been estimated to be about 116.5 ha, which includes 44.9 ha of forest land and 71.6 ha of private land. Being an off-river PSP, the environmental impacts of the project are minimal. | Land requirement: The total land required for the project components and related works has been estimated to be about 166.26 ha, which includes 60.49 ha of forest land and 105.77 ha of private land. Being an off-river PSP, the environmental impacts of the project are minimal. | The land area has increased (116.5 ha to 166.26 ha) under utilities and RoW after detailed engineering whereas earlier land details were based on the Project Prefeasibility. |
| 8. | Para 5 (vi) | The cost of the project is Rs. 5860 Crores at 2022- | The cost of the project is Rs. 7047.6 Crores at | The project cost is increased from |

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|---|---|---|---|---|
| | | 23 price level including Interest During Construction (IDC) of Rs. 635 Crores. As a preliminary estimate, a construction period of 5 years (60 months) from the date of award of civil works package has been estimated for this project. | 2023-2024 price level including Interest During Construction (IDC) of Rs. 1198.81 Crores. As a preliminary estimate, a construction period of 5 years (60 months) from the date of award of civil works package has been estimated for this project. | INR 5860 Crore to INR 7047.6 Crore is due to an increase of the project capacity, machineries, equipment's etc. |
| 9. | Para 5 (vii) | Proposed Project is located outside the Protected area and located more than 10 km away from boundary of Bhimashankar Wildlife Sanctuary (WLS) & Kalsubai Harishchandragad WLS. The final notification for ESZ of Bhimashankar WLS & Kalsubai Harishchandragad WLS published by MOEF vide notification dated 6th August 2020 & 28th April 2017 respectively and the proposed project is located outside the notified ESZ boundaries of both WLS. | Proposed Project is located outside the Protected area and located more than 10 km away from boundary of Bhimashankar Wildlife Sanctuary (WLS) & Kalsubai Harishchandragad WLS. The final notification for ESZ of Bhimashankar WLS & Kalsubai Harishchandragad WLS published by MOEF vide notification dated 6th August 2020 & 28th April 2017 respectively and the proposed project is located outside the notified ESZ boundaries of both WLS. | No Change |
| 10. | Para 5 (viii) | The proposed project is falling under ESA of Western Ghat as per MOEF draft ESA notification dated 6th July 2022. | The proposed project is falling under ESA of Western Ghat as per MOEF draft ESA notification dated 6th July 2022. | No Change |

**10.4.3** 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 amendment in terms of references (ToR) granted by the Ministry vide letter dated 24.03.2023 to the project for Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited.
- The project/activity is covered under Category A of item 1 (c) 'River Valley & Hydroelectric projects' of the Schedule to the Environmental Impact Assessment Notification, 2006 and requires appraisal at Central level by the sectoral EAC in the Ministry.
- The EAC noted that land requirement has been changed from 116.5 ha to 166.26 ha which includes increase in forest land from 44.9 ha to 60.49 ha and private land from 71.6 ha to 105.77 ha. Also, PP submitted the proposal for modification in the capacity generation from 1440 MW to 1500 MW and source of water from Manikdoh to Kalu River with pipeline of 3.5km has been changed. Further, PP has sought various amendment in ToR such as change on design of Upper dam, Lower Dam, Upper Intake/Outlet, Lower Intake/Outlet, Tail Race Tunnel, Pressure Shaft, Powerhouse, and Annual Power generation.
- The EAC observed that forest area has been increased which raised concern over loosing more forest land with minimal increase the project capacity. The committee deliberated that the project aims for minimal increase its capacity corresponding to large forest cover, therefore it is essential to consider the quality and ecological value of the forest areas being impacted versus the new areas being added.
- It was further observed that instant project lies in Western Ghats of Maharashtra state for which Ministry has issued Draft Notification of Eco-Sensitive Area dated 6th July, 2022. From this, it can be observed that New Hydropower projects and its activities are under regulated areas and shall be allowed as per the Environment Impact Assessment notification, published vide number S.O. 1533 (E), dated the 14th September, 2006 with certain terms and conditions mentions therein.

**10.4.4** The EAC after detailed deliberation observed that the instant proposal is for amendment in ToR dated 24.03.2023 for changed in capacity, area of the project, water source from Manikdoh to Kalu River with reduced distance of pipeline and certain changes in reservoir. It was observed that necessary permission for changed water source shall be obtained by PP from State Government. Also, data on water availability, e-flow as per Hon'ble NGT order and PP's proposal to fill the proposed reservoir in two years shall be submitted during appraisal of EC. PP has submitted the relevant justification for the proposed changes in the details of the project and amendment in ToR.

Further, one of the NGO has raised certain observation regarding this project such as presence of wildlife and its corridor connecting Harishchandragad-Kalsubai Wildlife Sanctuary, Bhimashankar Wildlife Sanctuary, Tansa Wildlife Sanctuary, Tungareshwar Wildlife Sanctuary, and Sanjay Gandhi National Park. and man-animal conflict, archaeological sites in the 10 km of buffer area of project, impact on project due to climate change etc.

Based on the information submitted and as presented, the EAC **recommended** the proposal for grant of amendment in terms of references (ToR) as proposed by the PP to the project for Malshej Ghat Bhorande Pumped Storage Project of capacity 1500 MW at village Adoshi & Bhorande, Tehsil Junnar & Murbad, District Pune & Thane (Maharashtra) by M/s Adani Green Energy Limited, under the provisions of EIA Notification, 2006, as amended along with the following additional ToR:

i. PP shall conduct mapping of wildlife corridor present (if any) in the project and buffer area of the project and submit the detail plan of its mitigation. Further, impact on important wildlife corridors and Human-Wildlife Conflict in the area shall be submitted
ii. PP shall submit the details of water availability in Kalu river and its catchment area/region for sustenance of the project. Also, data on water availability, e-flow as per Hon'ble NGT order and PP's proposal to fill the proposed reservoir in two years shall be submitted during appraisal of EC.
iii. Permission for usage of Kalu River as water source shall be obtained by PP from State Government and its likely impact on consumers shall be submitted.
iv. PP shall explore the possibility to minimize the forest area involved in the project and possibility to transplant the trees.
v. Project Proponent shall undertake a survey to count the number of trees to be cut down along with their nomenclature.
vi. Study shall be carried out on impact on fishes in Kalu River.
vii. Details of the archaeological sites/ancient caves in the vicinity of a 10 km radius from the proposed project site and likely impact.
viii. All other conditions mentioned in ToR dated 24.03.2023 shall remain unchanged.

**Any other Agenda with the permission of Chairman**

**<u>Agenda No. 10.5</u>**

**Conventional barrage across the River Tapi in an area of 36.03 ha. at Tehsil - Surat City, District - Surat, Gujarat by M/s Surat Municipal Corporation – For clarification**

**10.5.1** The EAC noted that a letter dated 26.02.2024 from M/s Surat Municipal Corporation seeking clarification about the applicability of EIA Notification, 2006 and its subsequent amendment.

It was observed that M/s Surat Municipal Corporation submitted the proposal no. IA/GJ/RIV/260681/2022 on 09.03.2022 for grant of ToR/ clarification about the applicability of EIA Notification 2006 and its subsequent amendment. Accordingly, the proposal was considered by the EAC in its meeting held on 14.03.2023 wherein EAC had returned the proposal and inter-alia observed that:

"*……25.4.3 The EAC observed that the instant proposal is for construction of conventional barrage across the River Tapi in an area of 36.03 ha. between Rundh and Bhatha localities in*

*Tehsil Surat City, District - Surat, Gujarat by M/s Surat Municipal Corporation. The project was undertaken to supplement water supply to the Surat city as well as to various industries situated along the right bank of river Tapi in Hazira area. This committee is mandated to consider the River valley projects having components of electricity generation and/or irrigation facility under the schedule 1(c) of the EIA Notification 2006, as amended. As per project details available for the instant proposal there is no mention of electricity generation and/or irrigation component. So, the proposal is not attracting the provisions mentioned under schedule 1(c) of the EIA Notification 2006, as amended. However, other prevailing rules and regulations shall be complied with….."*

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

i. M/s Surat Municipal Corporation (SMC) proposes to construct Conventional Barrage across River Tapi Between Rundh and Bhatha, Taluka Surat City, District Surat, Gujarat. Water to be stored in the reservoir of the barrage will be utilized for domestic purpose only.
ii. The location of the barrage has been finalized considering studies regarding availability of the storage capacity at different Pond Level. Also, with Pond Level at FRL (+) 5.0 m, the storage of the reservoir will be 18.735 MCM as per "Pond Storage Capacity" Report prepared by Facile Maven Private Ltd. in the year 2022.
iii. It is to be noted that, the Surat Irrigation Circle (SIC) has stated that the height of embankments on both banks of the Tapi River will be designed for the flood of 6 lakhs cusec such that it passes safely between the abutments. As seen from cross section, the width of the river at that place is around 2.8 km. The deepest gorge portion of the river is towards left side and the deepest bed level is at EL (-) 3.593 m as per latest survey done by Chetan Engineers in May 2022.
iv. The Location of Barrage has been finalized at Cross Section L-54 R-54, with abutments on both sides joining the available roads, near Rundh area on left side and Bhatha area on Right Bank side. The proposed axis shall connect the 60 m wide road on left bank at Surat Dumas road.
v. Considering all the alternatives on criteria of satisfying basic requirement of preventing surface and subsurface salinity and available storage, Alt – IV (R-54 L-54) between Rundh and Bhatha was selected.

vi. **Background**:
   a) Surat city is situated on the banks of the Tapi River, which is the only major source of fresh water in Surat city.
   b) In the year 1995, Surat Municipal Corporation (S.M.C) had constructed a low height weir across river Tapi at Singapore (30 km upstream of the confluence with the sea) having storage capacity of about 31.01 MCM (Million Cubic Meter).
   c) Considering the rapid growth of the Surat City, at the end of year 2041, water requirement for domestic purpose will be around 2,367 MLD.
   d) The construction of Conventional Barrage across Tapi River is proposed by SMC to create additional fresh water storage reservoir of capacity 18.735 MCM.

e) Also, at present, the tidal water from sea reaches upto Singanpore weir and make ground water of river bed and surrounding area saline.
f) Due to this barrage, a new storage reservoir will be created and tidal effect will move further downstream. As a result, ground water quality of the surrounding area of the reservoir will be improved over the time.

vii. **Benefits of The Project:**

- Creation of fresh water storage reservoir of capacity 18.735 MCM at Full Reservoir Level (FRL) (+) 5.00 m to meet the water supply demand for the Surat city.
- Prevention of the salinity ingression in the river bed and to recharge the ground water around the reservoir.
- Reduction in risk of erosion and flooding in flood prone neighborhoods.
- Improving traffic solution and urban mobility
- Interlink of the city network with areas across river.
- Improvement in environment and aesthetic condition of the city.

viii. The Ministry of Environment, Forest and Climate Change (MoEF&CC) has issued the CRZ clearance to the project vide letter no. 11/49/2023-IA.III dated 17/01/2024.

ix. Total Budget of INR **253** lakh would be allotted as capital cost for Environment Management Plan.

| Sr. No | Head | Detail | Capital Cost (INR in Lakhs |
|---|---|---|---|
| 1 | Solid waste/ Top soil/ Management | Provision of dustbins, Management of solid waste/debris/Top soil | 64 |
| 2 | Air Pollution | Barricading around Construction activity area | 13 |
| 3 | Water | Drinking water, Mobile toilets facilities, Drainage network and sanitation facility, Monitoring of Tapi River, etc. | 26 |
| 4 | Ecology and Biodiversity | Mangroves management plan, Post project Fish diversity study, conservation plan | 110 |
| 5 | Occupational Health & Safety | Medical checkup, PPE, Disaster management (Alert system, control room etc.) | 40 |
| **Total** | | | **253** |

**10.5.4** The EAC observed that the instant proposal is for construction of conventional barrage across the River Tapi in an area of 36.03 ha. near Rundh (left side) and Bhatha (right bank) of Surat, Gujarat is proposed by SMC to create additional fresh water storage reservoir of capacity 18.735 MCM in Tehsil Surat City, District - Surat, Gujarat by M/s Surat Municipal Corporation. The proposed project is not an irrigation project; it is proposed only for domestic/drinking water purpose, which does not come under the ambit of EIA Notifications, 2006 and its amendments therein.

But since PP has sought clarification in this regard from the Ministry, accordingly the Ministry has forwarded the proposal to look into construction of barrage in view of width 1212.50 m and length 10.44 km with storage capacity of 18.735 MCM for stipulating indicative, site specific, environment protection measures and other applicable statutory condition.

After detailed deliberation the EAC of the view that the proposal lacks information in terms e-flow in river, water quality, water balance, species of avi-flora and fauna and migration species in the river. The issues related to sediment in the river Tapi were discussed which may impact the aqueous environment. Therefore, the EAC deferred the proposal for want of more information on the project and mitigation measures taken in respect to Environment. It was desired that Project Authorities shall submit the all the studies conducted (if any) before the EAC with its technical presentation during next EAC meeting.

The project was ***deferred*** on above lines.

**Agenda No. 10.6**

**Karcham Wangtoo Hydroelectric Project (1000 MW) in District - Kinnaur, Himachal Pradesh by M/s JSW Hydro Energy Limited - MDC constitution Reg.**

**10.6.1** The EAC during deliberations noted the following:

- The EAC noted that Ministry has received a letter dated 27.02.2024 received from M/s JSW Hydro Energy Limited for formation of Multi-Disciplinary Committee (MDC) with list of nomination/members for Karcham Wangtoo HEP in District Kinnaur Himachal Pradesh to oversee the implementation of the suggested safeguard proposed in EIA/EMP report during construction of Karchham-Wangtoo Hydroelectric Project (1000 MW).
- During deliberations in the Ministry, it has been decided to formulate Terms of Reference of MDCs be formed in compliance of EC conditions of Hydroelectric projects.
- **Background of the project :**
  - Environmental Clearance vide letter dated 9.11.2005 in favour of M/s Jaypee Karcham Hydro Corporation Ltd to the project for Karchham-Wangtoo Hydroelectric Project (1000 MW) in District Kinnaur Himachal Pradesh with the condition no. (vii), that a Multidisciplinary committee should be constituted with representatives from various disciplines of forestry, ecology, wildlife, soil conservation, NGO etc., to oversee the effective implementation of the suggested safeguard measures.
  - The said EC dated 9.11.2005 was further transferred from M/s Jaiprakash Power Ventures to M/s Himachal Baspa Power Company Ltd vide letter dated 21.03.2016.
  - The Ministry further vide letter dated 6.08.2021 granted amendment/ expansion in EC for Enhancement of Capacity of Karcham Wangtoo Hydro Electric Project from 1000 MW to 1091 MW. EC letter dated 6t.08.2021 conditions states at Para 4 :

  *(ix) The Multi-Disciplinary Committee needs to be reconstituted and the meeting needs to be held at regular interval*

- The MDC comprises of the members from various discipline from State Govt. Departments, MoEF&CC & NGO as per one of the conditions of Environment Clearance letter issued to project.
- A Multi-Disciplinary Committee (MDC) constituted for monitoring the implementation of environmental safe guards undertaken by the project proponent (PP) in consultation with the Ministry as early as possible. The project proponent shall organize six monthly meetings of the Committee and submit the monitoring report to the Ministry.

**10.6.2** It was observed that retired senior officials from State Government like Chief Engineers, Professors, retired Scientist from MoEF&CC, CPCB, NEERI, SEIAA, SEAC, sectoral EAC-MoEF&CC may be included in the MDC instead of working members since most of the time they may depute some junior level officers due to their busy working schedule. The retired official may be nominated by name and their expertise.

**10.6.3** Terms of Reference for Multi-Disciplinary Committee (MDC)

Following significant points are to be deliberated during MDC meeting for effective implementation of environmental safeguards measures:

**Objectives**

- Ensure the project's construction and operation adhere to best practices, legal requirements, and environmental standards.
- Facilitate coordination among various stakeholders to address and mitigate project impacts efficiently.
- Monitor project progress, addressing challenges and opportunities in a timely manner.
- Promote transparency, sustainability, and social responsibility throughout the project lifecycle.
- Meeting Schedule should be on regular intervals during both construction and operation phases.
- Framework for making decisions, documenting, and communicating them to relevant parties.
- Mechanism for resolving disagreements within the committee.

**Scope of Work**

Before Construction:

- Regulatory and Legal Approvals: Secure necessary permits and approvals from local, regional, and national authorities.
- Ensure compliance with environmental regulations and standards.
- Develop detailed engineering designs including dam structure, turbines, generators, and auxiliary systems.
- Ensure robust safety and disaster management plans are in place.
- Engage with local communities, governments, and other stakeholders.
- Address public concerns and incorporate community feedback into project planning.

During Construction:

- Overseeing the implementation of the project plan, ensuring technical specifications, safety standards, and environmental safeguards are met. Following are the environmental safeguards components which are look into detail:

  a) Implementation status of Resettlement & Rehabilitation (R&R) Plan.
  b) Implementation status Catchment Area Treatment Plan.
  c) Implementation status and given suggestion to complete CAT work at the earliest
  d) Bio-diversity conservation plan
  e) Wild life management plan
  f) Environment Monitoring & Fuel provision
  g) Safety and health management at work force
  h) Muck Management Plan
  i) Compensatory Afforestation
  j) Reservoir Rim Treatment (RRT) Plan
  k) Socio-economic works
  l) Fisheries Management Plan
  m) Conservation of Endangered Species
  n) Public Health Delivery System

- Resolve issues related to i) direct forest dependency of the communities and the loss of forest cover and (ii) against the loss of forest cover Compensatory Afforestation, Green Belt Development, Soil and Moisture conservation, Catchment Area Treatment and during the implementation Biodiversity Conservation Plan along with other conservation activities will be taken up to compensate the forest loss.

- Administer the components in local area development like (i) Educational facilities (ii) Healthcare facilities (iii) Construction of community toilets and (iv) Development of training/educational institute.

- Monitoring the environmental impact, implementing mitigation measures such as dust separation, muck disposal, river conservation etc.
- Ensuring effective communication and consultation with affected communities and stakeholders.
- Reviewing and approving changes to the construction plan that affect the scope, budget, or timeline.

<u>During Operation:</u>

- Monitoring operational performance against projected outcomes and compliance with regulatory requirements. Following are the environmental safeguards components which are look into detail during operation of the HEP:
  a) Restoration of dumping site.
  b) Restoration of quarry site
  c) Ensuring ongoing environmental monitoring and adherence to environmental management plans.

- Facilitating adaptive management to respond to unforeseen impacts or operational challenges.
- Overseeing maintenance plans and safety protocols to ensure the longevity and efficiency of the hydroelectric facility.

**The meeting ended with vote of thanks to and from the Chair.**

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**Annexure**

## ATTENDANCE

| S. No. | Name | Role | Attendance |
|---|---|---|---|
| 1. | Prof. G. J. Chakrapani | **Chairman** | P |
| 2. | Dr. Udaykumar R. Y. | Member | P |
| 3. | Dr. Mukesh Sharma | Member | A |
| 4. | Dr. J V Tyagi | Member | P |
| 5. | Shri Kartik Sapre | Member | P |
| 6. | Shri Ajay Kumar Lal | Member | P |
| 7. | Shri Rajeev Varshney | Representative of CEA | P |
| 8. | Shri Alok Paul Kalsi | Representative of CWC | P |
| 9. | Dr. J.A. Johnson | Representative of WII | P |
| 10. | Dr. A.K. Sahoo | Representative of CIFRI | P |
| 11. | Shri Munna Kumar Shah | Member Secretary | P |

## APPROVAL OF THE CHAIRMAN

**Email** **Munna Kumar Shah**

**Re: Draft MoM of 10th EAC meeting held on 29th April, 2024**

**From :** chakrapani govind <chakrapani.govind@gmail.com> Wed, May 08, 2024 05:50 PM
**Subject :** Re: Draft MoM of 10th EAC meeting held on 29th April, 2024
**To :** Munna Kumar Shah <munna.shah@gov.in>

Approved.
G.J. Chakrapani

On Wed, 8 May, 2024, 14:40 Munna Kumar Shah, <munna.shah@gov.in> wrote:

> Dear sir
>
> It is to inform that no further comments has been received from the members. It is requested to kindly provide your approval of MoM of 10th EAC meeting held on 29th April, 2024 for uploading on PARIVESH Portal.
>
> Submitted for consideration please.
>
> Thank you
>
> Regards
>
> Munna Kumar Shah
> Scientist E